

PM SHRI KENDRIYA VIDYALAYA INS KALINGA,BHEEMUNIPATNAM
AUTUMN BREAK HOLIDAYS HOME WORK 2026-27

CLASS-3

HINDI:

१. किन्ही 5 एकवचन-बहुवचन शब्द लिखो
२. किन्ही 5 लिंग बदलने वाले शब्द लिखो
३. फूलदेई पर्व के बारेमे अपने शब्दों में लिखो
४. किन्ही ३ वर्णों का बारहखडी लिखो

TWAU:

Lesson	Questions
Lesson 7 – Water: A Precious Gift	1. Name any three sources of water. 2. Write two uses of water. 3. Write two ways to save water.
Lesson 8 – Food We Eat	1. Name three foods we get from plants. 2. Name two foods we get from animals. 3. Why do we need food?
Lesson 9 – Staying Healthy and Happy	1. Write four healthy habits. 2. Why should we wash our hands before eating? 3. Why is exercise important?
Lesson 10 – This World of Things	1. Name four things you see around you. 2. Write what these things are made of: chair, glass, book, spoon. 3. Name one hard thing and one soft thing.
Lesson 11 – Making Things	1. Who makes pots from clay? 2. Name two things made by a carpenter. 3. Name two things that are made by hand.
Lesson 12 – Taking Charge of Waste	1. What is waste? 2. Give two examples of wet waste and two examples of dry waste. 3. Write two ways to reduce waste.

MUSIC:

 Class 3 Music Autumn break –

Holiday Homework: "Bansuri" (Vocal & Rhythm) 

General Instructions:

- All written and drawing work must be done in your **Art/Music Notebook**.
 - Focus on creativity, color, and regular singing practice.
 - Parents are requested to guide and encourage the child without doing the work for them.
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Activity 1: Vocal Practice & Singing (Patriotic & Folk)

- **The National Anthem:** Practice singing the **National Anthem** (*Jana Gana Mana*) daily with the correct posture, rhythm, and clear pronunciation. Make sure you stand straight and attentive!
- **Inspirational Song:** Learn and practice all stanzas of the song "**Hum Honge Kamyab**" (*We Shall Overcome*).
- **Folk Connection:** Listen to or learn any one regional folk song mentioned in your syllabus (e.g., *Odia, Kashmiri, Konkani, or Tamil*). Write down the title of the song and what it tells you about that culture in 2–3 lines.

Activity 2: Discovering the Building Blocks (Swaras & Sounds)

- **The 7 Notes:** Practice reciting and singing the **7 basic Swaras (Sa, Re, Ga, Ma, Pa, Dha, Ni)** in order.
- **Musical Patterns:** Write down a simple 4-beat pattern using the *Sargam / Alankar* building blocks (e.g., *Sa-Re-Ga-Ma, Re-Ga-Ma-Pa*) in your notebook.
- **Listening Journal:** Listen to any two different songs at home (in any language). Note down:
 1. Name of the song
 2. Name of the singer
 3. Your favorite line or reason why you liked the song

Activity 3: Creative Rhythm (Kitchen Orchestra & Shakers)

- **Build a "Kitchen Orchestra":** Find safe objects around your kitchen (like a steel plate, plastic bowl, spoon, or small steel glass) and see what different sounds they produce.
- **Rhythm Challenge:** Practice playing the basic counts—**1, 2, 3, 4**—or rhythmic syllables like "*Ta Ka Ta Ki Ta*" by gently tapping your kitchen instruments or clapping your hands.
- **DIY Shaker:** Make a simple musical shaker using an empty plastic bottle or container. Put a small handful of rice, grains, or pebbles inside, seal it tightly, and decorate it beautifully.

Activity 4: Art & Instrument Identification

- **Draw Your Favorite Instrument:** In your notebook, draw and color one classical Indian musical instrument mentioned in your textbook (such as a **Bansuri / Flute, Tabla, or Sitar**).

- **Describe It:** Write a short paragraph (4–5 lines) explaining how that instrument is played (e.g., by blowing air, striking with hands, or plucking strings).

Evaluation Matrix: Rubric for Teachers (Total: 20 Marks)

The homework will be graded on a total of **20 marks** based on the criteria below. Teachers can use this simple framework for quick assessment when school reopens:

Evaluation Criteria	Excellent (5 Marks)	Good (4-3 Marks)	Needs Improvement (2-1 Marks)	Score
Vocal Pitch & Pitching (Sur)	Sings the National Anthem and <i>Swaras</i> accurately in tune without faltering.	Sings mostly in tune with very few structural slips.	Struggles significantly to hold a stable pitch or tune.	/ 5
Rhythm & Timing (Taal)	Maintains a steady 4-beat pattern and executes the shaker/kitchen beats accurately.	Maintains rhythm mostly well but drops the tempo occasionally.	Shows clear difficulty matching or holding a steady beat.	/ 5
Creativity & Craft (DIY Shaker)	Shaker is exceptionally creative, neat, sounds good, and uses household waste effectively.	Shaker is functional and neat, though designs are basic.	Shaker is incomplete, messy, or non-functional.	/ 5
Notebook Work & Presentation	Drawing is vivid, well-colored, and the 5-line instrument description is highly accurate.	Drawing is neat, and details are mostly correct with minimal spelling errors.	Work is incomplete, illegible, or lacks basic alignment with the text.	/ 5

Total Marks Obtained: _____ / 20

Teacher's Feedback & Comments: _____

Would you like me to add a **certificate of completion / appreciation slip** that you can cut out and hand over to students who score highly? Or should we include **parents' signatures and feedback boxes** in this section?

ENGLISH:

Lesson	Holiday Homework
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Lesson 7 – Making a Difference	1. Write 5 new words from the lesson and their meanings. 2. Write 4 sentences about how you can help others. 3. Write two good habits you want to follow during the holidays.
Lesson 8 – A Little Fish Story	1. Write 5 water animals. 2. Write 5 new words from the lesson and use any 2 in sentences. 3. Write 3 sentences about why water is important.
Lesson 9 – The Green Planet	1. Write 5 things we get from plants. 2. Write 4 sentences about how to protect plants. 3. Write the names of 5 trees around you.
Lesson 10 – The Yellow Butterfly	1. Write 5 describing words for a butterfly. 2. Write 5 sentences about a butterfly. 3. Draw and colour a butterfly.
Lesson 11 – The Wonder of Nature	1. Write 5 things you see in nature. 2. Write 5 new words and their meanings. 3. Write 4 sentences about your favourite part of nature.

MATHS:

Q1. Write the names of any five 3D shapes and draw their faces.

Example: Cuboid – Rectangle

Q2. Open any parcel box and draw its net.

Q3. Solve the following division problems using repeated subtraction.

Example: $36 \div 6$

$$36 - 6 = 30$$

$$30 - 6 = 24$$

$$24 - 6 = 18$$

$$18 - 6 = 12$$

$$12 - 6 = 6$$

$$6 - 6 = 0$$

Total number of repeated subtractions required to reach zero = 6.

Therefore, $36 \div 6 = 6$.

Solve the following:

a) $49 \div 7$

b) $50 \div 10$

c) $35 \div 5$

d) $44 \div 4$

Q4. Form different numbers using the digits 2, 8, 4, 6, and 0. Use each digit only once in each number.

Example: 20,846

CLASS-4

HINDI:

१. किन्ही 5 शब्दों का पर्यायवाची शब्द लिखो
२. किन्ही 5 स्त्रीलिंग - पुल्लिंग शब्द लिखो
३. ओणम त्यौहार के बारे में अपने शब्दों में लिखो
४. किन्ही 5 विलोम शब्दों को लिखो
५. किन्ही 5 वर्णों का बारहखादी लिखो

TWAU:

Q1. Write the names of any five trees around you. Draw their leaves and colour them.

Q2. Draw your school campus and label the different rooms and places, such as the Principal's Chamber, Activity Room, Music Room, Art Room, Library, and Classes I to V.

Q3. Draw a plant, label any ten parts, and write their names.

Q4. Draw your family tree.

ENGLISH:

Note : Answer all the questions. Attempt each and every sub – question of the questions that are given to you.

Read, write and learn the meanings of the following words.

Water conservation

Water management

Tradition

Culture & Heritage

Unique methods

List out any three water conservation methods that you have studied from the lesson “What a Tank!? Explain it in detail.

What do you mean by the term “Water harvesting pits”? How are they constructed? What are the various benefits of it?

List out the various traditional games of India and explain in brief the procedure to play those games (any six to seven games)

What is the difference between indoor games & outdoor games. Tabulate it..

Read, write and learn any ten idioms and its meanings.

Read any novel / short story book and do a book review on it.

MATHS:

Instructions

Complete all work neatly in your Maths notebook.

Write the date and question numbers.

Show calculations wherever necessary.

Do the activities yourself.

1. Draw 4 objects around you (ball, book, clock, window) and write the shapes they look like.

2. Measurement

a) Convert 5 m into centimetres.

b) Convert 3 kg into grams.

c) Convert 4 litres into millilitres.

d) Add: 3 m 45 cm + 2 m 30 cm.

e) Subtract: 8 kg 500 g – 3 kg 250 g.

3. Make a pattern by skip counting in 4s and continue it up to 10 numbers.

4. A town has 4,325 people. If 2,175 more people come, how many people live in the town now?

5. Measure the length of a pencil, your notebook, and a spoon in centimetres and write their lengths in order from shortest to longest.

6. Find the things from your surroundings which are different in shapes like circle, rectangle, square, oval etc. and draw the picture with the name of object and shape.

7. Collect 2 wrappers and paste in your notebook. Write the manufacturing and expiry dates written on them.

8. Make the calendar of the month October. Show all the holidays with different colours.

5. Go to market and buy some fruits and vegetables. Make a table and write the prices of 10 fruits/vegetables along with their quantity.

MUSIC:

Class 4 Music Autumn break - Holiday Homework: "Bansuri" (Exploring Sound & Rhythm)

General Instructions:

-
- All written, observation, and drawing tasks must be completed in your **Music Notebook**.
- Dedicate 10–15 minutes daily to your vocal and rhythmic practice.
- Parents are requested to encourage exploration and guide children with safety during the sound experiments.
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Activity 1: Vocal Mastery & Swara Patterns (Sargam / Alankar)

- **The Patriotic Spirit:** Practice singing the National Anthem (*Jana Gana Mana*) and the National Song (*Vande Mataram*) with complete devotion, correct posture, and clear diction.
- **Alankar Patterns:** Class 4 explores advanced step-by-step note patterns. Practice singing the following patterns clearly on a steady scale:
 1. *Sa-Re-Ga, Re-Ga-Ma, Ga-Ma-Pa, Ma-Pa-Dha, Pa-Dha-Ni, Dha-Ni-Sa* (Ascending)
 2. *Sa-Ni-Dha, Ni-Dha-Pa, Dha-Pa-Ma, Pa-Ma-Ga, Ma-Ga-Re, Ga-Re-Sa* (Descending)
- **Write It Down:** Copy these two *Alankar* patterns neatly into your notebook and practice saying them at a fast and slow speed.
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Activity 2: Acoustic Observations (Low Pitch vs. High Pitch)

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- **Nature's Music:** Sit quietly in a park, balcony, or near a window for 10 minutes. Listen closely to the sounds around you.
- **Sound Mapping Table:** Draw a table in your notebook with two columns: "**Low-Pitched Sounds (Heavy/Deep)**" and "**High-Pitched Sounds (Sharp/Shrill)**". Categorize at least 4 sounds or animals you observe (e.g., a crow's caw vs. a sparrow's chirp, or a heavy truck engine vs. a bicycle bell).
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Activity 3: Creative Rhythm (DIY Percussion & Clapping Taals)

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- **The 8-Beat Rhythm (Kaherva Taal):** Practice a standard 8-beat loop by clapping your hands. Try to count smoothly from **1 to 8** repeatedly on a steady rhythm without speeding up.
- **DIY Sound Explorer:** Create a custom musical instrument using recycled cardboard or cardboard boxes.
 - *Option A:* Stretch 3–4 rubber bands of different thicknesses across an open tissue box to create a mini **"Rubber-Band Sitar"**.
 - *Option B:* Create a **"Cardboard Hand-Drum"** by taping a stiff cardboard sheet over an empty container.
- **Practice:** Use your new instrument to tap along with your favorite song.
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Activity 4: Folk Music & Traditional Instruments

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- **The Folk Corner:** Talk to your parents or grandparents and find out about one traditional folk song from your native state or culture. Write down:
 1. The name or first line of the song.
 2. The occasion when it is sung (e.g., festivals, harvest, weddings, or monsoons).
- **Instrument Spotlight:** Choose any one Indian wind instrument (like the *Bansuri / Flute, Shehnai, or Pungi*) or string instrument (like the *Tanpura or Veena*). Draw it beautifully in your notebook, color it, and write 4 lines about how it creates sound.
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 Evaluation Matrix: Rubric for Teachers (Total: 20 Marks)

Evaluation Criteria	Excellent (5 Marks)	Good (4-3 Marks)	Needs Improvement (2-1 Marks)	Score
Vocal Execution & Alankars	Sings the step patterns (<i>Alankars</i>) perfectly in tune with excellent breath control.	Sings patterns mostly in tune; minor rhythm shifts or hesitation when moving down notes.	Struggles to hit the accurate pitches of individual notes or remember the order.	/ 5

Rhythmic Accuracy & Taal	Keeps a perfectly steady 8-beat loop and applies it creatively to the DIY instrument.	Keeps a steady beat most of the time but rushes or slows down slightly.	Unable to track or tap a stable beat loop independently.	/ 5
Acoustic Understanding	Accurately identifies and explains the difference between high and low pitch with 4+ examples.	Correctly sorts pitch types but definitions or examples are basic.	Confuses low-pitched sounds with high-pitched sounds or chart is incomplete.	/ 5
Instrument Craft & Notebook	DIY instrument is highly creative and functional. Drawing is detailed and accurately colored.	Instrument is creative but flimsy. Notebook entries are clear and complete.	Project is messy, missing sections, or instrument does not function.	/ 5

Total Marks Obtained: _____ / 20

Teacher's Feedback & Comments: _____

If you want to modify this blueprint, let me know:

- Would you like me to substitute any activity with **regional music traditions or specific state folk dances**?
- Do you want an **interactive multiple-choice worksheet** about musical instruments added to this assignment?
- Should we include a **student self-reflection section** at the bottom?

CLASS -5

HINDI:

1. विभिन्न ट्रैफिक नियमों को लिखकर सड़क संकेतकों का चित्र बनाइए)Page No. 60) Of your textbook.
2. चतुर चित्रकार कविता याद करके लिखकर चित्र बनाइए।
3. ऐसे पक्षी सुरक्षित रहें।-पानी और पशु-हवा ,पौधे-उपाय लिखिए जिससे जंगल के पेड़ 10
4. एक दिन और रात में कुल कितने पहर होते हैं। आप इन पहरों में क्या लिखिए। ,क्या करते हैं- (Page No. 80) Of your textbook

बजे 9 बजे से 6

बजे 12 बजे से 9

.बजे 3 बजे से 12

बजे 6 बजे से 3

5. सजनात्मक लेख

1दशहरा त्योहार के बारे में अनुच्छेद लिखें। .

(2दुर्गा पूजा त्योहार के बारे में 1वाक्य लिखें 5

(3दीवाली के त्योहार बारे में पांच वाक्य लिखें।

TWAU:

1. Write a few sentences about “republic day” parade.
2. Mention any three ways to save water.
3. Draw different kinds of dustbins .
4. Write a few sentences about “mangroves”. Draw a picture.

ENGLISH:

Note : Answer all the questions.

Attempt each and every sub – question of the questions that are given to you.

A. Read, write and learn the meanings of the following words. Water conservation Water management Tradition Culture & Heritage Unique methods

B. List out any three water conservation methods that you have studied from the lesson “ What a Tank!? Explain it in detail.

C. What do you mean by the term “Water harvesting pits”? . How are they constructed?.What are the various benefits of it?

D. List out the various traditional games of India and explain in brief the procedure to play those games(any six to seven games) E. What is the difference between a indoor games & outdoor games . Tabulate it..

F. Read, write and learn any ten idioms and it's meanings.

G. Read any novel / short story book and do a book review on it.

MATHS:

- Q1. Complete the textbook exercises for the completed chapters in your textbook.
- Q2. Find the area and perimeter of a rectangle with a length of 7 cm and a breadth of 5 cm.
- Q3. Find the area and perimeter of a square with a side length of 10 m.
- Q4. Write the number of flat surfaces and curved surfaces of each of the following 3D shapes:
- a) Cylinder
 - b) Sphere
 - c) Cone
 - d) Cube
 - e) Square pyramid
 - f) Rectangular prism

MUSIC:

 **Class 5 Music Autumn break – Holiday Homework: "Bansuri" (Vocal Percussion & Soundscapes)** 

General Instructions:

-
- All observation logs, writing, and creative artwork must be completed in your dedicated **Music Notebook**.
- Spend **10–15 minutes daily** practicing vocal pitches, rhythm tempos, and breath control.
- Parents are requested to support and encourage children during listening sessions and rhythm tracking.
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Activity 1: Vocal Execution & Community Singing (Sur & Expression)

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- **The Devotional Track:** Memorise and practice singing the famous prayer song "**Itni Shakti Hame Dena Daata**" with perfect pronunciation and a steady pitch. Focus on holding your breath smoothly through long lines.
- **The Folk Rhythm:** Learn the rhythm and basic tune of the traditional Marathi folk song "**Mi Dolkara**" (or a local regional fishing/harvest community song approved by your teacher).
- **Exercise:** Record yourself singing one of these songs using a basic live pitch or karaoke backdrop if available.

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Activity 2: My Everyday Musical Map (Sound Exploration)

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- **Tracking Your Day:** Create a tabular log in your notebook titled "**My Daily Soundscape**". For three days, pause at different times and notice the music or sound surrounding you.
- Fill out a chart detailing the following four markers:
 1. **Time & Place:** (e.g., *7:00 AM in bed* or *5:00 PM on the balcony*)
 2. **The Source of Sound:** (e.g., *Screaming morning alarm, Birds chirping, Radio prayers, Traffic*)
 3. **Musical Attribute:** Define it using terms like **Pitch** (High/Low), **Tempo** (Fast/Slow), or **Dynamics** (Loud/Soft).
 4. **The Emotion:** Write down how that sound or piece of music makes you feel (e.g., *Calm, Grumpy, Energetic, Tired*).

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Activity 3: Creative Rhythm (A Cappella & Beatboxing)

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- **Vocal Percussion (Beatboxing):** Experiment with vocal rhythm by making drum sounds using your mouth. Practice the classic pattern:
 - **"Boots 'n Cats 'n"** (Repeat: *Boots-and-Cats-and-Boots-and-Cats*)
 - *Tip:* The **"Buh"** sound imitates a heavy, low bass drum, while **"Cc"** and **"Tt"** emulate sharp, higher-pitched drums.
- **The Cup Song Rhythm:** Practice an **8-beat pattern** by clapping your hands and tapping a safe plastic cup upside down on a table. Try to maintain a perfectly steady speed (tempo) from start to finish without rushing.

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Activity 4: Research Project – Musical Traditions of India

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- **The Living Legend:** Pick any legendary Indian classical music artist or local folk group from your region (e.g., [Pandit Hariprasad Chaurasia](#), [Ustad Bismillah Khan](#), or [M.S. Subbulakshmi](#)).
- Write a short profile in your notebook covering:
 1. Name of the artist and the main instrument they play/played.

2. The unique music style or tradition they belong to.
3. Paste a picture or draw a visual representation of their primary musical instrument.

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Evaluation Matrix: Rubric for Teachers (Total: 20 Marks)

Evaluation Criteria	Excellent (5 Marks)	Good (4-3 Marks)	Needs Improvement (2-1 Marks)	Score
Vocal Fluency & Pitch	Sings " <i>Itni Shakti</i> " accurately in tune, capturing the emotional expression perfectly.	Sings mostly in pitch with accurate lyrics; minor slips in long note extensions.	Struggles significantly with lyrics, breath control, or holding a steady key.	/ 5
Vocal Percussion & Tempo	Performs the 8-beat loop or beatboxing pattern smoothly at an unfluctuating tempo.	Manages the rhythm pattern but alters speed or shifts focus midway.	Unable to mimic vocal beats or hold a stable rhythmic pattern.	/ 5
Everyday Sound Mapping	Log chart is completely filled using precise terms like <i>Pitch, Tempo, and Dynamics</i> .	Chart is done cleanly but relies on basic descriptions instead of musical terminology.	Log is messy, casual, or missing major observation entries.	/ 5
Artist Project & Heritage	Profile is thorough, uniquely written, and accompanied by a detailed, accurate illustration.	Basic profile info is present with decent neatness.	Content is plagiarised, incomplete, or lacks presentation effort.	/ 5

Total Marks Obtained: _____ / 20

Teacher's Feedback & Comments: _____

If you would like to fine-tune this template, tell me:

- Would you like me to substitute the regional song choice with a **specific state's folk music**?
- Should I add a section linking the **dance chapters** of the textbook (like Mudras or rhythmic tempos)?
- Do you need **step-by-step lyrics** printed out for the primary vocal songs?

CLASS-6

HINDI:

- I) अपठित गद्यांश प्रश्न बनाके उत्तर भी लिखना
- II) पठित पद्यांश प्रश्न बनाके उत्तर भी लिखना (1, 3, 7 पाठ में)
- III) संज्ञा परिभाषा और 10 उदाहरण लिखना
- IV) सर्वनाम परिभाषा और 10 उदाहरण लिखना
- V) विशेषण परिभाषा और 10 उदाहरण लिखना

ENGLISH:

- 1) Write a paragraph of about 200 words on how you spend your autumn break at home.
2. Write five examples of adjectives and adverbs.
3. Write a list of common healing spices used in our daily lives.
4. Write two words every day, along with their synonyms and antonyms.
5. Write five sentences in the present perfect tense using the magic words “thank you,” “please,” and “sorry.”
6. Write a brief note on your favourite character from the novel you have read.
7. Write a biographical sketch of the author of the novel, including their life, career, and achievements.
8. Write a diary entry about the best match you enjoyed during the holidays.
9. Read the lessons “Sports and Wellness” and “The Winner.” Find the difficult words and their meanings, and write them in your notebook.
10. Write an informal letter to your grandmother thanking her for teaching you about home remedies and explaining how they have helped you in your daily life.
11. Write a formal letter to the Principal requesting three days’ leave to attend your brother’s wedding or due to illness.
12. Create a detailed comic strip featuring any sportsperson.

TELUGU:

1. అచ్చులు – హల్లులు

- అచ్చులు (Vowels) రాయండి.
- హల్లులు (Consonants) రాయండి.

2. గుణింతాలు (Guninthalu)

- క, గ, చ, ట, త, ప అక్షరాలకు గుణింతాలు రాయండి.
- క నుంచి ళ వరకు గుణింతాల పట్టికను రాయండి.
- మీకు నచ్చిన ఐదు హల్లులకు గుణింతాలు రాసి చదవండి.

3. ఒత్తులు

- ఒత్తులు ఉన్న ఐదు పదాలు రాయండి.

4. పదాలను కలిపి రాయండి

- క + మ + ల = _____
- ప + ల + లి = _____
- పు + స్త + కం = _____
- చె + ట్టు = _____
- ప + క్షి = _____

5. ఖాళీలను పూరించండి

- తెలుగు మన _____ భాష.
- సూర్యుడు పగటిపూట _____.
- రాత్రిపూట ఆకాశంలో _____ కనిపిస్తాయి.
- మనం పాఠశాలలో _____ నేర్చుకుంటాము.
- చెట్లు మనకు _____ ఇస్తాయి.

6. వ్యతిరేక పదాలు

- మంచి × _____

- పగలు × _____
- పెద్ద × _____
- ఎత్తు × _____
- వెలుగు × _____

7. పర్యాయపదాలు

- ఇల్లు, నీరు, సూర్యుడు, భూమి, అడవి — వీటికి పర్యాయపదాలు రాయండి.

8. ఏకవచనం – బహువచనం

- పుస్తకం – _____
- చెట్టు – _____
- పువ్వు – _____
- పక్షి – _____
- పిల్లవాడు – _____

9. వాక్యాలు రాయండి

- పాఠశాల, అమ్మ, చెట్టు, పుస్తకం, స్నేహితుడు — ప్రతి పదంతో ఒక వాక్యం రాయండి.

10. పేరా రచన

- “నా పాఠశాల” అనే అంశంపై 5 వాక్యాలు రాయండి.

11. చిత్రలేఖనం

- మీకు నచ్చిన ఒక చిత్రాన్ని గీసి, దాని గురించి 5 వాక్యాలు రాయండి.

12. చేతిరాత

- రోజుకు ఒక పేజీ తెలుగు చేతిరాత రాయండి.

Instructions: Complete the work neatly in a separate Telugu notebook. Practise reading and writing every day. Submit after the autumn break.

MATHS:

1. Write and learn tables from 1 to 20

2. Find the place values for each of the digit for the followings
1)353 2)254 3)568
3. Find the LCM for the followings
1)12, 15, 2)24, 32, 3)12, 16, 32
4. Find the HCF for the followings
1)12, 15, 2)24, 32, 3)12, 16, 32
5. Write the common multiples for the followings (first six only)
1)6, 8, 2)9, 12, 3)12, 14
6. Write the weight units
7. Write the distance units
8. Make any five 2-d and 3-d shapes with card board
9. Write prime numbers up to 100(read and write)

SCIENCE:

Chapter: Temperature and its Measurement

MDP: Food – A Multidisciplinary Approach

Part A: Science – Temperature and its Measurement

Section I: Very Short Answer Questions

Answer the following in one or two sentences.

1. What is temperature?
2. Name the instrument used to measure temperature.
3. What is the SI unit of temperature?
4. What is the commonly used unit for measuring the temperature of our body?
5. Why can we not always judge the temperature of an object by touching it?
6. What is a clinical thermometer?
7. Name two types of thermometers.
8. What is the normal body temperature of a healthy human being in degrees Celsius?

Section II: Short Answer Questions

Answer in 3–4 sentences.

1. Differentiate between heat and temperature.
2. Why should we use a thermometer instead of touching an object to find its temperature?
3. Write any three precautions to be followed while using a thermometer.
4. Differentiate between a clinical thermometer and a laboratory thermometer.
5. Explain how a digital thermometer measures temperature.

6. Why should a laboratory thermometer generally be kept upright while measuring the temperature of a liquid?

Section III: Application-Based Questions

1. Riya measures the temperature of warm water by touching it and says it is very hot. Her brother uses a thermometer and obtains a reading of 45°C. Explain why the thermometer gives a more reliable measurement.
2. A student observes that the temperature of a liquid increases when it is heated. What does this tell us about the relationship between heating and temperature?
3. Why is it important to measure temperature accurately in hospitals, science laboratories and weather stations? Write 3–4 points.

Part B: Multidisciplinary Project (MDP)



MDP Topic: FOOD – The Fuel of Life

Project objectives

- Understand the importance of food for growth, energy and good health.
- Identify different food groups and their sources.
- Recognise healthy eating habits and reduce food wastage.
- Connect food with local culture, agriculture and everyday mathematics.

Tasks



Science – Food and Nutrition

1. List five foods you commonly eat.
2. Classify them as energy-giving, body-building or protective foods.
3. Make a chart showing carbohydrates, proteins, fats, vitamins, minerals and their food sources.
4. Draw a balanced diet plate and label its food groups.
5. Write five healthy eating habits.

SOCIAL:

1. Read the following chapters :-
 - a) Oceans and Continents
 - b) Local Govt. In Rural Areas - and write 10 important points in your homework notebook from each chapter.
2. In political map of India Mark & label states and UTs and neighbouring countries .
3. In Physical map of World , mark and label all continents and oceans .
4. Learn & write explanation of all six fundamental rights in your notebook.

SANSKRIT:

कक्षा - ६ (SEA)

- * १) सङ्गणकम् (Computer) चित्रं निर्माय तस्य विषये दश संस्कृतवाक्यानि लिखत।
- * २) दश जन्तूनां चित्राणि निर्माय तेषां संस्कृतनामानि लिखत।
- * ३) बालक तथा बालिका शब्दरूपौ, पठ् (पठति) धातुरूपं च लिखत।

MUSIC: Class 6 Music —Autumn break Holiday Homework

Textbook Reference: *Kriti (Grade 6 Arts / Music)*

Objectives

- To understand the link between **musical notes (Swaras)**, **rhythms (Taal)**, and human emotions.
 - To explore different classifications of musical instruments.
 - To foster listening skills and cultural appreciation.
-

Task 1: The Swara & Laya Journal (Practical & Expressive)

Theme: *Music and Emotions (Kriti Chapter 6)*

1. **The Seven Swaras:** Write down the 7 basic notes of Indian classical music (**Sa, Re, Ga, Ma, Pa, Dha, Ni**) in your music notebook.
 2. **The Mood Diary:** Pick 3 different songs you hear during the holidays (e.g., a patriotic song, a lullaby, and a fast Bollywood/folk song). For each song, fill out a chart answering the following:
 - **Song Name & Type:** (e.g., Bhajan, National Song, Lullaby)
 - **Laya (Tempo):** Is it *Drut* (Fast), *Madhya* (Medium), or *Vilambit* (Slow)?
 - **Emotion Felt:** What emotion does it evoke in you? (e.g., Happiness, Sadness, Devotion, Energy)
-

Task 2: "Best Out of Waste" Musical Instrument (Creative Project)

Theme: *Musical Instruments Classification (Kriti Book)*

Create a functional model of **one** musical instrument using household scrap items (empty boxes, rubber bands, plastic bottles, or straws).

- **Tag Your Work:** On a small card attached to your instrument, write:
 1. The name of the instrument.
 2. Its category: Is it an **Avanaddha Vadya** (Percussion/Drums like Tabla), **Sushira Vadya** (Wind instrument like a Flute), or **Tata Vadya** (String instrument like a Sitar)?
 3. A 2-sentence description of how it produces sound.
-

Task 3: Mini Revision Worksheet (Theoretical)

Answer these questions in your music notebook based on your class readings:

1. **Multiple Choice Questions:**

- Which musical instrument is universally associated with Lord Krishna? (*Sitar / Flute / Tabla / Veena*)
- What term describes a regular rhythm cycle in Indian music? (*Swar / Laya / Taal / Raga*)
- A song sung specifically to put babies to sleep peacefully is called a _____. (*Bhajan / Lullaby / Qawwali*)

2. **Short Answer:**

- Who is widely celebrated as the "Nightingale of India"?
- Briefly explain how the *speed (Laya)* of a rhythm can change a person's emotional state.

Submission Guidelines

- **Presentation:** Submit the Swara Journal and Worksheet in a neat A4 folder or your designated music notebook.
- **Creativity:** Make sure your handmade instrument is safely packed so it doesn't break during transit.
- **Assessment Criteria:** You will be graded on *Timely Submission (5 Marks)* and *Subject Enrichment/Creativity (5 Marks)*.

ARTIFICIAL INTELLIGENCE:

1. What Is Machine Learning ? Mention Different Types Of Machine Learning Techniques.
2. Write About Different Types Of AI. Explain Them Briefly.

CLASS-7

ENGLISH:

1. Write a descriptive paragraph (100–150 words) about a train journey you have experienced. Describe the sights, sounds, and overall atmosphere.
2. Write a formal application to the Principal requesting 3 days of leave. You may choose either of the following reasons:

- Attending your brother's marriage.
 - Medical leave due to sickness.
3. Read the poem "Travel" by Edna St. Vincent Millay. Identify and note down the difficult words along with their meanings, and list the poetic devices used in the poem.
 4. Create a short, creative comic strip based on an interview scenario (e.g., a reporter interviewing a famous personality or an employer interviewing a candidate).
 5. Write a detailed diary entry expressing your thoughts and feelings about your favorite holiday destination.
 6. Read the newspaper daily during your vacation. Find out one new word every day, and write down its meaning and usage in a sentence.
 7. Learn a new collocation every day and write two original sentences using it.
 8. Write two original sentences every day using each of the following tenses:
 - Present Perfect Tense
 - Present Perfect Continuous Tense
 - Past Perfect Tense
 - Past Perfect Continuous Tense
 9. Find two new words every day and write down at least two synonyms and two antonyms for each day.
 10. Write a paragraph of about 200 words describing how you spent your autumn break at home.

MATHS:

1. Write and learn tables from 1 to 20
2. Convert into the fractions

1) 3.53 2) 0.254 3) 56.889
3. Find the LCM for the followings

1) 12, 15, 18 2) 24, 32, 42 3) 12, 16, 32
4. Find the HCF for the followings

1) 12, 15, 2) 24, 32, 3) 12, 16, 32
5. Write the common multiples for the followings (first six only)

1) 6, 8, 2) 9, 12, 3) 12, 14
6. Write the weight units
7. Write the distance units

8. Make any five 2-d and 3-d shapes with card board
9. Write prime numbers up to 100(read and write)

SCIENCE:

Instructions for Handwritten Submission

1. This homework must be done by hand. Write it in a separate Science notebook or on A4 sheets (ruled or plain) and stitch or file them neatly. Typed or printed answers will not be accepted.
2. Write with a blue or black pen. Use a pencil for diagrams and label them neatly. Underline headings. Leave a margin on every page.
3. Write the chapter name and the question before each answer. Number the answers exactly as in this sheet.
4. Read the NCERT chapter again before answering. Write answers in your own words. Do not copy from the internet or from guides.
5. Do the 'Do and Record' activities at home with your parents' or an elder's help. Never taste unknown substances, and never use electric mains or sockets. Use only cells for the electricity activity.
6. Make a neat cover page with your name, class, section, roll number and the title 'Science Autumn Break Homework'.
7. Submit the homework to your Science teacher on the day school reopens. Take your parent's signature on the last page.

Chapter 2: Exploring Substances – Acidic, Basic and Neutral

Part A: Quick Check (1 mark each)

1. Fill in the blanks: (a) Acids turn blue litmus _____. (b) Bases turn red litmus _____. (c) Neutral substances _____ change the colour of litmus.
2. Write True or False and correct the false statements: (a) Lemon juice turns red litmus blue. (b) Soap solution is basic. (c) Vinegar is a neutral substance. (d) Neutralisation produces salt and water.
3. Name any two natural indicators. State the colour change of turmeric when it is rubbed with soap.
4. Draw a table and classify the following as acidic, basic or neutral: lemon juice, vinegar, baking soda solution, soap solution, sugar solution, common salt solution, curd, milk of magnesia.
5. Write two uses of neutralisation in daily life.

Part B: Short Answer Questions (2 marks each)

6. What is an indicator? Why is turmeric called a natural indicator?
7. Why is baking soda or calamine solution applied on the sting of an ant or a wasp?
8. Why should we never taste or touch unknown substances to test them?

9. Write any three differences between acids and bases.
10. Why is an antacid tablet given to a person suffering from acidity? Name the type of substance it is.

Part C: Long Answer Questions (3 marks each)

11. What is neutralisation? Explain with an example and the word equation. Give three examples from daily life where it is used.
12. Describe how you would prepare a natural indicator from red cabbage or China rose petals. How would you use it to identify an acid and a base?

Part D: Do and Record (5 marks)

13. Collect six household substances (e.g. lemon juice, vinegar, soap solution, baking soda solution, sugar solution, salt solution). With an adult's supervision, test each with turmeric paper or a red cabbage extract. Record your observations in a table with the columns: Substance | Indicator used | Colour change | Acidic / Basic / Neutral. Write what you learnt in 3 to 4 lines. (Do not taste any substance.)

Chapter 3: Electricity – Circuits and Their Components

Part A: Quick Check (1 mark each)

1. Fill in the blanks: (a) An electric cell converts _____ energy into electrical energy. (b) A circuit in which current flows is called a _____ circuit. (c) Materials that allow current to pass through them are called _____.
2. Draw the symbols used in circuit diagrams for: a cell, a battery, a bulb, a switch in the ON position, a switch in the OFF position, and a connecting wire.
3. Write True or False: (a) Current flows in an open circuit. (b) Rubber is a good conductor. (c) The filament of a bulb glows because of the heating effect of current. (d) A fuse is connected in series in a circuit.
4. List two conductors and two insulators from things you use at home.
5. What is the function of a fuse? Name one device that is used in homes in place of a fuse.

Part B: Short Answer Questions (2 marks each)

6. What is an electric circuit? Differentiate between an open circuit and a closed circuit.
7. What is the use of a switch in an electric circuit?
8. Why should we never touch electrical appliances or switches with wet hands? Why do electricians use tools with plastic or rubber handles?
9. Differentiate between a cell and a battery.
10. What is the heating effect of electric current? Give two appliances that work on this effect.

Part C: Long Answer Questions (3 marks each)

11. Draw a neat circuit diagram of a circuit having two cells, a bulb and a switch in the closed position. Label the parts. Explain how the bulb glows when the switch is closed.
12. Explain how a fuse protects electrical appliances. Why is a copper wire not used as a fuse wire? State three safety precautions to be followed while using electricity.

Part D: Do and Record (5 marks)

13. Make a simple circuit using a cell, a small torch bulb (or LED), a switch (or a paper clip) and connecting wires. Draw its diagram. Test any eight household objects (e.g. coin, pencil lead, eraser, key, plastic scale, wooden spoon, aluminium foil, thread) by connecting them in the circuit, and record whether the bulb glows. Make a table: Object | Bulb glows (Yes/No) | Conductor / Insulator. (Use only cells; never use electric mains or sockets for any activity.)

Chapter 4: The World of Metals and Non-metals

Part A: Quick Check (1 mark each)

1. Fill in the blanks: (a) The only metal that is liquid at room temperature is _____. (b) The only non-metal that is lustrous is _____. (c) Metals are generally _____ conductors of heat and electricity.
2. Classify the following as metals or non-metals: iron, sulphur, copper, carbon, aluminium, oxygen, zinc, iodine.
3. Write True or False: (a) Sodium is a soft metal that can be cut with a knife. (b) Non-metals are generally malleable. (c) Graphite is a good conductor of electricity. (d) Oxides of metals are generally acidic in nature.
4. Write the word equation for the burning of magnesium in air.
5. Name one metal each that is used for: (a) electric wires (b) making jewellery (c) making cooking vessels (d) packaging chocolates.

Part B: Short Answer Questions (2 marks each)

6. Define malleability, ductility and sonority. Give one example of each.
7. Why are cooking utensils made of metals while their handles are made of plastic or wood?
8. Why is sodium stored in kerosene?
9. What happens when an iron nail is dipped in copper sulphate solution? Give the reason and the word equation.
10. Why are non-metals brittle? Write two physical properties in which non-metals differ from metals.

Part C: Long Answer Questions (3 marks each)

11. Differentiate between metals and non-metals on the basis of: appearance, hardness, malleability and ductility, conduction of heat and electricity, sonority, and the nature of their oxides. Present your answer in a table.
12. Explain how you can show that the oxide of a metal is basic and the oxide of a non-metal is acidic. Give one example of each with the word equations.

Part D: Do and Record (5 marks)

13. Go on a 'metal hunt' at home. List ten objects made of metals and ten objects made of non-metals. For each metal object, write the property (e.g. strength, shine, conduction, malleability) due to which that metal is used. Paste pictures or draw them neatly on a separate A4 sheet to make a collage.

Chapter 5: Changes Around Us – Physical and Chemical**Part A: Quick Check (1 mark each)**

1. Fill in the blanks: (a) Rusting of iron is a _____ change. (b) Melting of ice is a _____ change. (c) A change in which a new substance is formed is called a _____ change.
2. Classify the following changes as physical or chemical: melting of wax, burning of a candle, rusting of an iron nail, dissolving sugar in water, souring of milk, cooking of an egg, tearing of paper, boiling of water.
3. Write True or False: (a) Burning of paper can be reversed. (b) Dissolving salt in water is a physical change. (c) Rusting needs both air and water. (d) Formation of curd from milk is a physical change.
4. Name any four observations that show a chemical change has taken place.
5. Write the two conditions necessary for rusting of iron.

Part B: Short Answer Questions (2 marks each)

6. Differentiate between a physical change and a chemical change with three points and one example each.
7. Melting of wax is a physical change, but burning of wax is a chemical change. Explain why.
8. What is rusting? Write any two methods by which rusting can be prevented.
9. What is crystallisation? Is it a physical or a chemical change? Give an example.
10. Why is the cooking of food considered a chemical change?

Part C: Long Answer Questions (3 marks each)

11. Describe an experiment to show that both air and water are necessary for rusting. Draw a labelled diagram of the set-up and write your observations.
12. Magnesium ribbon burns with a dazzling white flame. Explain why this is a chemical change. Write the word equation, and state how the product formed will behave towards red and blue litmus.

Part D: Do and Record (5 marks)

13. Rust watch: Take three iron nails (or iron clips). Keep one in a dry bottle, one in water, and one in water with a few drops of oil on top. Observe for seven days and record in a table: Day | Nail 1 | Nail 2 | Nail 3. Write your conclusion in 3 to 4 lines. Also list five physical and five chemical changes you notice at home during the holidays.
-

Chapter 6: Adolescence – A Stage of Growth and Change**Part A: Quick Check (1 mark each)**

1. Fill in the blanks: (a) Adolescence is the period of life between about _____ and _____ years of age. (b) The changes that take place in the body during adolescence are called _____. (c) The master gland of the body is the _____ gland.
2. Write True or False: (a) Hormones are secreted by the endocrine glands. (b) Lack of iodine in food can cause goitre. (c) Insulin is secreted by the thyroid. (d) Balanced diet is not important during adolescence.
3. Name the gland that secretes (a) insulin (b) thyroxine (c) the male sex hormone (d) the female sex hormone.
4. Write two changes seen in boys and two changes seen in girls during adolescence.
5. What is meant by a balanced diet? Name the two minerals which are very important for growing adolescents.

Part B: Short Answer Questions (2 marks each)

6. What is puberty? How are the changes during puberty controlled?
7. Why is a balanced diet important during adolescence?
8. What is the role of the thyroid gland? Why is it recommended to use iodised salt?
9. What is the function of the pancreas? What happens if it does not secrete enough insulin?
10. List any three habits of personal hygiene that adolescents should follow.

Part C: Long Answer Questions (3 marks each)

11. Write the changes that take place in the body during adolescence. Mention the changes common to boys and girls and those that are different.
12. Adolescents often face emotional ups and downs and stress. Suggest five healthy ways in which they can handle these changes. Why should adolescents avoid tobacco and other harmful substances?

Part D: Do and Record (5 marks)

13. Make a 'Healthy Habits Chart' for 15 days of your holiday. Record every day: hours of sleep, glasses of water, minutes of exercise or outdoor play, hours of screen time, and whether you ate fruits and vegetables. At the end, write 4 to 5 lines on which habit you want to improve and how.
-

Holiday Project: Science All Around Me (10 marks)

Choose any ONE of the following, and make it on A4 sheets or chart paper. Present it neatly by hand, with drawings or pasted pictures.

1. Make a poster or a flow chart on 'Acids, bases and neutral substances in my kitchen'.
2. Make a scrapbook on 'Uses of metals and non-metals in my home'.
3. Make a poster on 'Electrical safety at home' with at least eight safety rules and drawings.
4. Make a poster on 'Changes around me: physical and chemical' with ten examples and pictures.
5. Make a poster on 'My healthy adolescence' showing diet, exercise, hygiene and emotional well-being.

Submission Checklist (tick before submitting)

- ☐ Cover page is made, with my details.
- ☐ All questions of Chapters 2 to 6 are answered by hand.
- ☐ All five 'Do and Record' activities are done, with tables.
- ☐ Diagrams are drawn neatly in pencil and labelled.
- ☐ The holiday project is complete.
- ☐ My parent has signed the last page.

Parent's Signature: _____ Date: _____

Have a joyful, curious and safe autumn break!

– Science Department, KV INS Kalinga

SOCIAL:

Solve Half Yearly question paper.

Read the following chapters :-

A)The Story of Indian Farming

B) Empires and Kingdoms (6th tp 10th Century) & write important points in your homework notebook.

3.In 2 political maps of India Mark & label state and UTs and neighbouring countries .

4. In 2 Physical maps of World Mark and label all continents and oceans .

5. Learn & Explain all fundamental rights.

HINDI:

- * अनुच्छेद लेखन - 30 लाइन्स (किसी भी विषय पर)
- * संवाद लेखन - बातचीत (दोस्त के बीच)
- * पत्र लेखन
- * पर्यायवाची शब्द - 20 शब्द
- * विलोम शब्द - 20 शब्द
- * भाववाचक संज्ञा (10) और विशेषण (10) (उदाहरण: गुस्सा, सुंदर, सुंदर फूल आदि)

SANSKRIT:

- * क) अपने बारे में और परिवार के बारे में दश संस्कृत वाक्य लिखो (आत्मपरिचय: परिवारपरिचयश्च दशसु संस्कृतावाक्येषु लिखत)।
- * ख) गृहे उपयुज्यमानानां पञ्चदश (15) वस्तूनां चित्राणि निर्माय तेषां संस्कृतनामानि लिखत।
- * ग) बालक, बालिका, पुस्तक शब्दरूपणि लिखत तथा च पठ् (पठति) धातुरूपं वर्तमानकाले (Present), भूतकाले (Past) च भविष्यत्काले (Future) लिखत।

MUSIC: 🎵 Class 7 Music —Autumn break - Holiday Homework

Textbook Reference: *Kriti (Grade 7 Arts Education — Music Section)*

🎯 Objectives

- To understand the layers of musical structure (Melody, Harmony, Lyrics, and Rhythm).
- To explore the connection between classical *Ragas* and the *Samay Chakra* (Time Theory).
- To appreciate regional oral traditions and community folk music.

🎧 Task 1: The Song Anatomy & Layering Project

Theme: *Making Music & Harmony (Kriti Chapter 5)*

Select any **one** of your favourite songs (can be a patriotic song, a devotional track, or a school anthem) and perform a "musical dissection" in your music notebook:

1. **Basic Details:** Write the Song Title, Original Singer/Artist, Composer, and Lyricist.
2. **Layer Analysis:** Listen closely and list the **musical elements** you hear:
 - **Voice & Vocal Style:** Is it solo, a duet, or a chorus/group singing?
 - **Instruments:** Name at least 3 distinct musical instruments you can hear in the background tracks.
 - **Tempo & Mood:** Describe the speed (Fast/*Drut*, Medium/*Madhya*, or Slow/*Vilambit*) and the emotional theme (*Rasa*) it creates.

Task 2: The Swara & Samay Chakra Chart

Theme: *Ragas and Talas (Kriti Chapter 7)*

In Indian Classical Music, certain Ragas are sung at specific times of the day (called the *Samay Chakra*).

1. Research **Raga Bhairavi** (covered in your textbook). On an A4 sheet, draw a creative clock or "Time Wheel" depicting its traditional performance time.
2. The *Kriti* textbook connects the seven core notes (*Swaras*) to nature. Find and write down the **animal or bird** that represents each of these notes:
 - **Sa** (Shadj) → (e.g., Peacock)
 - **Re** (Rishabh) → _____
 - **Ga** (Gandhar) → _____
 - **Ma** (Madhyam) → _____
 - **Pa** (Pancham) → _____
 - **Dha** (Dhaivat) → _____
 - **Ni** (Nishad) → _____

Task 3: Local Musician / Folk Tradition Interview

Theme: *The Music of the People (Kriti Chapter 8)*

Locate a local singer, music teacher, or someone in your family/neighbourhood who sings traditional folk songs, bhajans, or plays a regional musical instrument. Conduct a short interview and document their responses in your notebook:

- What is the name of their music style, and which state or region is it from?
- What instrument do they use, and how does it generate sound?
- Ask them to share one line of their favourite folk song and write down its meaning in your own words.
- *Optional extension:* Create a small **photo collage** of traditional folk musicians from your home state.

Task 4: Theory & Vedic Roots Worksheet

Answer the following questions briefly in your notebook based on Chapter 5 & 6:

1. **What is Canon Singing?** Explain how teamwork works when different groups start the same melody at staggered intervals.
2. In ancient Vedic *Samagana* music, the composition is divided into five parts (*Bhagas*). Name these five parts beginning with *Prastava*.

3. Define the musical terms: **Aadhara Shruti** (Base note) and **Laya** (Tempo).
-

Submission & Assessment Guidelines

- **Notebook Work:** Tasks 1, 3, and 4 should be cleanly written out in the Music/Arts notebook.
- **Creativity Metric:** Task 2 (Samay Chakra Chart) should be colourful and visually engaging.
- **Evaluation Matrix:** *Depth of Research (4 Marks) + Vocal/Musical Element Understanding (3 Marks) + Presentation & Neatness (3 Marks) = Total 10 Marks.*

AI:

- 1.What Are The Different Visualization Techniques ,Explain Different Techniques?
- 2.What Is Machine Learning,Explain The Types.

CLASS-8

HINDI:

नोट-

- 1कार्य को अपनी आभ्यास पुस्तिका (notebook) में कीजिए।
- 2कार्य को सुंदर और साफ़ लखें ।

- प्रश्न 1-अनुच्छेद मेरे जीवन का सबसे -यादगार त्यौहार ।
प्रश्न 2-किन्हीं 10शब्दों का दोदो पर्याय-वाची शब्द लिखिए।
प्रश्न 3-'स्वच्छ भारत अभियान पर एक आकर्षक विज्ञापन या पोस्टर बनाए ।
प्रश्न 4- प्रतिदिन एक पेज सुलेख लिखना।
प्रश्न 5-किसी एक विषय पर संवाद लिखो ।

ENGLISH:

- 1). Write an informal letter to Siddhartha, the grandson. After reading your grandfather's heartfelt letter, you decide to write back to him expressing your thoughts feelings, and how his words have inspired you. Write an informal letter to your grandfather in about 150-180 words.

2. Describe the poem Harvest Hymn in your own words and identify the literary devices used in the poem.

3.3. Write an article on "Trees: Our Lifeline."

4. Write a descriptive essay for your school magazine about something in nature that has attracted your attention. It may be an object, a place, or an event you have experienced.

5. Write two sentences each using binomials, participles, and gerunds every day.

6. Learn and write the meanings of 15 new vocabulary words related to autumn (e.g., nostalgia, melancholy, and harvest).

7. Read the lesson The Cherry Tree. Identify the difficult words, write their meanings, and explain the theme of the lesson.

8. Write two sentences each every day using the following tenses: Present Perfect Tense Present Perfect Continuous Tense Past Perfect Tense Past Perfect Continuous Tense

MATHS:

1. Write and learn tables from 1 to 20

2. Convert into the fractions

1) 3.53 2) 0.254 3) 56.889

3. Find the LCM for the followings

1) 12, 15, 18 2) 24, 32, 42 3) 12, 16, 32

4. Find the HCF for the followings

1) 12, 15, 2) 24, 32, 3) 12, 16, 32

5. Find the area and perimeter for the square, rectangle, and triangle

1) Square- side=6cm 2) Rectangle-L=6cm, B=4cm 3) Triangle-Base=6cm, Height=12cm
other side=8cm

6. Write the weight and distance units

7. Draw and write the all types of angles with their ranges.

8. Write prime numbers up to 100 (read and write)

SCIENCE:

1) Answer all the questions of Half yearly question paper

Chapter 2: The Invisible Living World: Beyond Our Naked Eye

2. What are microorganisms? Describe any four major groups of microorganisms with examples.

3. Explain the useful and harmful effects of microorganisms in our daily lives.

Chapter 3: Health: The Ultimate Treasure

4. What is a balanced diet? Explain the importance of carbohydrates, proteins, fats, vitamins and minerals for maintaining good health.

5. Differentiate between communicable and non-communicable diseases. Give two examples of each and mention preventive measures.

Chapter 4: Electricity: Magnetic and Heating Effects

6. Explain the heating effect of electric current with two examples from everyday life. Why are electric wires covered with insulating materials?

7. What is an electromagnet? Describe an activity to demonstrate how an electromagnet can be made using a battery, an insulated copper wire and an iron nail.

Chapter 5: Exploring Forces

8. What is force? Explain the effects of force on the shape, speed and direction of motion of an object with suitable examples.

9. Differentiate between contact forces and non-contact forces. Give two examples of each.

10. What is friction? Explain two advantages and two disadvantages of friction in everyday life

SOCIAL :

- Solve Half Yearly question paper.
- Read the following chapters :-
 - a) World Geography:Some Glimpses.
 - b) India's Long Road to Independence and write 10 important points in your homework notebook.
- 3.In 2 political maps of India Mark state and UTs and neighbouring countries .
- 4. In 2 Physical maps of World Mark and label all continents and oceans.

SANSKRIT:

* १) स्वकीयायाः दिनचर्यायाः (Daily Routine) विषये विंशतिः (20) संस्कृतवाक्यानि लिखत।

- * २) पर्यावरणसंरक्षणस्य विषये दश (10) संस्कृतसूक्तीः पठित्वा लिखत।
- * ३) १तः ५० पर्यन्तं संस्कृतभाषायां सङ्ख्याशब्दान् लिखत।

MUSIC:

Class 8 Music — Autumn break – Holiday Homework

Textbook Reference: *Kriti (Grade 8 Arts Education — Music Units)*

Objectives

- To master the practical application of core **Elements of Music** (Chapter 5).
- To explore the mechanics and structural groupings of **Musical Instruments** (Chapter 6).
- To understand foundations of **Indian Classical Music** (Chapter 7).
- To explore personal and social interactions with rhythm via **My World of Music** (Chapter 9).

Task 1: The "Elements of Sound" Audio Log

Theme: *Discovering the Elements of Music (Kriti Chapter 5)*

Students will create a listening analysis log in their music notebook. Choose **two** contrasting pieces of music (e.g., one classical instrumental piece and one modern acoustic/pop track) and map their structural DNA by answering the following:

1. **Pitch Exploration:** Does the singer rely mostly on *Mandra Saptak* (lower register), *Madhya Saptak* (middle register), or *Taar Saptak* (higher register)?
2. **Tempo & Dynamics:** Identify the underlying *Laya* (Tempo). Does the loudness (*Dynamics*) change drastically across the track, or does it stay uniform?
3. **Texture Observation:** Are you hearing a single voice singing unaccompanied (*Monophonic*), or is a main voice layered with background harmonies and multiple underlying instruments (*Polyphonic*)?

Task 2: Comparative Chart — Indian vs. Western Instruments

Theme: *Musical Instruments (Kriti Chapter 6)*

On an A3 sized chart paper, construct a detailed **four-column classification table**. Draw or paste pictures of **two Indian instruments** and **two Western instruments** for each of the structural families described in the text:

Instrument Classification	Sound Production Method	Indian Examples	Western Counterparts
Tata Vadya (<i>Chordophones / String</i>)	Vibrating tightly bound strings	Sitar, Veena	Acoustic Guitar, Violin

Sushira Vadya (<i>Aerophones / Wind</i>)	Vibrating columns of air	Bansuri, Shehnai	Flute, Clarinet
Avanaddha Vadya (<i>Membranophones / Drums</i>)	Striking a stretched skin membrane	Tabla, Dholak	Snare Drum, Timpani
Ghana Vadya (<i>Idiophones / Solid Percussion</i>)	Striking resonant solid materials	Manjira, Ghatam	Triangle, Maracas

Task 3: Raga Study — The Blueprint of Indian Classical Music

Theme: *Indian Classical Music & Imagination (Kriti Chapters 7 & 8)*

Research **Raga Bilawal** (or any primary morning *Raga* mentioned in your textbook). Create a single-page profile covering:

1. **The Swara Framework:** Write out its specific *Aaroha* (ascending notes) and *Avroha* (descending notes).
2. **Key Structural Notes:** Define its *Vadi Swara* (most dominant note) and *Samvadi Swara* (second most critical note).
3. **The Time Theory Integration:** Explain which specific *Prahar* (3-hour slot of the 24-hour day cycle) this Raga corresponds to according to classical *Samay Chakra*.

Task 4: Practical Reflection — Music in Everyday Life

Theme: *My World of Music (Kriti Chapter 9)*

Write a short, descriptive 150-word essay titled "**How Music Contextualizes My Everyday Life**". Address the following cues:

- How does the role of a functional traditional folk song (sung during harvest or festivals) contrast structurally with a commercial, heavily processed film background score?
- Keep a log of where you unexpectedly encounter music over a 48-hour window (e.g., street celebrations, digital streaming ads, ringtones, or morning birdsong) and describe how those ambient layers alter your mood.

Submission & Assessment Guidelines

- **Notebook Entries:** Tasks 1, 3, and 4 must be written using neat handwriting in the Music/Arts notebook.
- **Visual Presentation:** Task 2 (Comparative Instrument Chart) must look clean, balanced, and accurately labelled.
- **Marking Schema:**

- *Conceptual Accuracy with Textbook Material* — 4 Marks
- *Critical Listening & Analytical Reasoning* — 3 Marks
- *Neatness & Artistic Visual Elements* — 3 Marks
- **Total Score Matrix: 10 Marks**

ARTIFICIAL INTELLIGENCE:

- 1.What Are The Different Machine Learning Techniques.Explain Each Of Them Briefly?
- 2.What Is The Ai Ethics.Explain The Ethical Issues.

CLASS-9

HINDI:

नोट-

- 1कार्य को अपनी आभ्यास पुस्तिका (notebook) मे कीजिए।
- 2कार्य को सुंदर और साफ लेखे ।

प्रश्न के सभी प्रश्न पत्र हल कीजिए 2 - पी टी 1 -।

प्रश्न 2 –संज्ञा की परिभाषा बताकर उसके प्रकारों को उदाहरण सहित समझाइए।

प्रश्न 3 –विशेषण की परिभाषा दीजिए और उसके प्रकारों को उदाहरण सहित समझाइए।

प्रश्न 4 –अलंकार की परिभाषा दीजिए और उसके सभी प्रकारों को उदाहरण सहित समझाइए।

प्रश्न 5 –विशेष्य की परिभाषा बताकर उसके दो उदाहरण लिखिए।

ENGLISH:

- 1.Write a diary entry describing a memorable moment during the autumn break.
- 2.Write a descriptive paragraph on "The Role of Technology in Education."
- 3.Analyse a newspaper editorial and write down three new things you learned from it.
- 4.Write the theme and poetic devices used in the poem Nine gold medals poem.

5. Write a descriptive paragraph on "The Role of Technology in Education."
6. Analyse a newspaper editorial and write 3 new things you learned.
7. Learn and write the meanings of 15 new vocabulary words related to autumn (e.g., nostalgia, melancholy, and harvest).
8. Write two sentences each every day using the following tenses:
 Present Perfect Tense
 Present Perfect Continuous Tense
 Past Perfect Tense
 Past Perfect Continuous Tense
9. Practice the direct indirect speech daily 2 sentences.
10. Create comic strip by illustrating about an interview.
11. Write a factual description on favourite novel.

TELUGU:

1. అచ్చులు – హల్లులు

- అచ్చులు, హల్లులు రాయండి.

2. గుణింతాలు (Guninthalu)

- క, గ, చ, ట, త, ప అక్షరాలకు గుణింతాలు రాయండి.
- క నుంచి క వరకు గుణింతాల పట్టికను రాయండి.
- ఏవైనా పది హల్లులను ఎంచుకుని వాటి గుణింతాలు రాయండి.

3. ఒత్తులు – సంయుక్తాక్షరాలు

- ఒత్తులు ఉన్న పది పదాలు రాయండి.
- సంయుక్తాక్షరాలు ఉన్న పది పదాలు రాయండి.

4. పర్యాయపదాలు

- సూర్యుడు, చంద్రుడు, భూమి, నీరు, గాలి, అడవి, సముద్రం, ఇల్లు, పువ్వు, పక్షి — వీటికి పర్యాయపదాలు రాయండి.

5. వ్యతిరేక పదాలు

- సుఖం × _____
- విజయం × _____
- స్వర్గం × _____
- ధైర్యం × _____
- లాభం × _____
- వెలుగు × _____
- సత్యం × _____
- ఆరంభం × _____
- దగ్గర × _____
- స్వచ్ఛం × _____

6. ఏకవచనం – బహువచనం

- పుస్తకం, చెట్టు, పువ్వు, పక్షి, పిల్లవాడు, విద్యార్థి, కథ, నది, బొమ్మ, గురువు — బహువచనాలు రాయండి.

7. పదభాగాలు

- ఐదు నామవాచకాలు, ఐదు సర్వనామాలు, ఐదు క్రియలు, ఐదు విశేషణాలు రాయండి.

8. సామెతలు

- కింది సామెతల అర్థాలు రాయండి:
- 1) అందని ద్రాక్ష పుల్లన. 2) ఆలస్యం అమ్మతం విషం.
- 3) ఐకమత్యమే మహాబలం. 4) మితిమీరితే అమ్మతం కూడా విషమే.

9. వాక్య నిర్మాణం

- విద్య, ప్రకృతి, క్రమశిక్షణ, స్నేహం, నిజాయితీ, పర్యావరణం, గురువు, దేశభక్తి — ప్రతి పదంతో ఒక వాక్యం రాయండి.

10. పేరా రచన

- కింది అంశాలలో ఏదైనా రెండింటిపై 10 వాక్యాలు రాయండి:
- నా పాఠశాల; పర్యావరణ పరిరక్షణ; విద్యార్థి జీవితంలో క్రమశిక్షణ; మాతృభాష ప్రాముఖ్యత.

11. లేఖ రచన

- మీ పాఠశాలలో జరిగిన ఒక కార్యక్రమం గురించి మీ స్నేహితునికి లేఖ రాయండి.

12. పఠనాభ్యాసం

- తెలుగు పాఠ్యపుస్తకంలోని ఒక పాఠాన్ని చదివి, 10 కొత్త పదాలను వాటి అర్థాలతో రాయండి.

13. చేతిరాత

- ప్రతిరోజూ ఒక పేజీ తెలుగు చేతిరాత రాయండి.

Instructions: Complete the work neatly in a separate Telugu notebook. Practise reading and writing every day. Submit after the autumn break.

MATHS:

1. Solve the PT-1 and PT-2 exam papers.

SCIENCE:

Biology:

Units Covered

Unit 1: Tissues in Action — Complete unit

Unit 2: Reproduction: How Life Continues — Up to Asexual Reproduction

Includes written work, competency-based questions, diagrams and subject enrichment activities.

General instructions

Complete the written work neatly in your Biology notebook.

Draw diagrams with pencil and label them accurately.

Complete the subject enrichment activities.

Prepare the project work on A4 sheets or in a project file.

Revise the definitions, differences, functions and diagrams from both units.

Part A: Unit 1 – Tissues in Action

Section I: Short Answer Questions (2–3 marks each)

1. Differentiate between meristematic tissue and permanent tissue.
2. Explain the functions of parenchyma, collenchyma and sclerenchyma.
3. Differentiate between xylem and phloem on the basis of their functions and materials transported.
4. What are the differences between simple permanent tissues and complex permanent tissues?
5. Explain the structure and function of epithelial tissue.
6. Differentiate between areolar tissue and adipose tissue.
7. Write three differences between tendons and ligaments.
8. Compare striated, smooth and cardiac muscles on the basis of structure, location and control.
9. Explain the structure and function of a neuron with a labelled diagram.

10. What are the major functions of connective tissue in animals?
11. Explain how the structure of ciliated epithelium helps it perform its function.
12. What are joints? Explain the importance of joints in movement.

Section II: Long Answer Questions (4–5 marks each)

1. Classify plant tissues into their major categories. Explain their functions with suitable examples.
2. Describe the different types of simple permanent tissues in plants, including their characteristic features and functions.
3. Explain the structure and functions of xylem and phloem.
4. Classify epithelial tissues and describe their locations and functions with suitable examples.
5. Describe the major types of connective tissues in animals and explain their functions.
6. Compare the three types of muscle tissues with suitable diagrams.
7. Draw a neat, labelled diagram of a neuron and explain the functions of its main parts.
8. Explain how different animal tissues work together to enable movement and coordination.

Part B: Unit 2 – Reproduction: How Life Continues

Long Answer Questions (4–5 marks each)

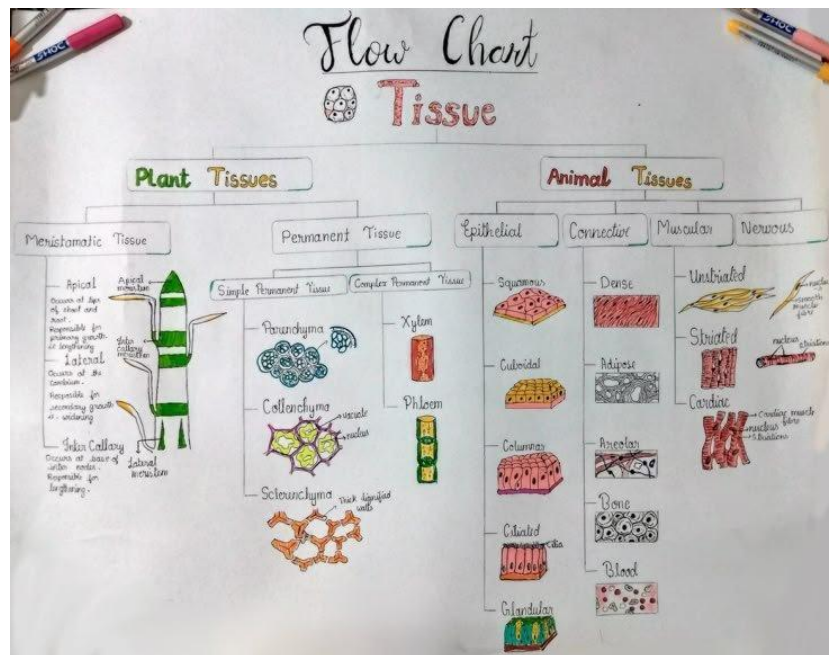
1. Explain the different modes of asexual reproduction with suitable examples.
2. Describe binary fission, budding and fragmentation with labelled diagrams.
3. Explain spore formation and vegetative propagation, giving suitable examples of each.
4. Compare different methods of asexual reproduction on the basis of the process involved and organisms in which they occur.
5. Explain the importance of reproduction in maintaining the continuity of life.

Note: Use diagrams and examples consistent with the prescribed NCERT textbook

Part C: Subject Enrichment Activities

Complete activities from Tissues in Action. These activities assess observation, creativity, scientific understanding and practical application.

Activity 1 – Tissues in Action



Title: Tissue Identification Chart

Objective: To identify different plant and animal tissues and connect their structures with their functions.

Materials required: A4 sheets or chart paper, pencil, ruler, colours and textbook references.

Procedure:

Divide a chart into two sections: Plant Tissues and Animal Tissues.

Include at least three types of plant tissue and four types of animal tissue.

Draw a suitable labelled diagram for each selected tissue.

Mention the location, one structural feature and one function of each tissue.

Add a short conclusion explaining why tissues are important in multicellular organisms.

Activity 2: Prepare a comparison table of the three types of muscle tissues, including diagrams, location, structure and voluntary or involuntary action.

Chemistry:

Syllabus: Chapter 1 – Mixtures and Separation; Chapter 2 – Inside the Atom

Name: _____ Section: _____ Roll No.: _____

General Instructions

1. Attempt all questions in a separate, neat Chemistry homework notebook (or A4 sheets pinned together). Write the question number before each answer.
 2. Short Answer (SA) questions carry 2 marks each; Long Answer (LA) questions carry 3 or 5 marks, as indicated.
 3. Show every step in numerical problems, with proper units and correct significant figures.
 4. Draw neat, labelled diagrams / structures wherever required.
 5. Most questions are from the NCERT textbook. Revise the NCERT text, in-text questions and activities of each chapter before attempting.
 6. Submit the homework on the day school reopens. Neatness and presentation carry marks.
-

Chapter 1: Mixtures and Separation (Properties and Methods of Separation)

Section A: Short Answer Questions (2 marks each)

1. Differentiate between homogeneous and heterogeneous mixtures. Give two examples of each.
2. What is a pure substance? How does it differ from a mixture?
3. What is the Tyndall effect? Which of the following show it: salt solution, milk, muddy water, starch solution?
4. Define solute and solvent. Name the solute and the solvent in (i) tincture of iodine (ii) aerated drink (iii) brass.
5. Define solubility. What is a saturated solution? State two factors that affect the solubility of a solid in a liquid.
6. Name the technique you would use to separate: (i) cream from milk (ii) salt from sea water (iii) iron filings from sand (iv) dyes in black ink (v) oil from water.
7. Why is a separating funnel used to separate a mixture of kerosene oil and water? Explain the principle.
8. What is chromatography? On what principle is it based? State two applications.
9. Why is sublimation used to separate a mixture of ammonium chloride and common salt? Name two other substances that sublime.

10. Why does a solution of copper sulphate not scatter a beam of light, whereas a mixture of starch in water does?
11. Define the concentration of a solution. Calculate the mass percentage of a solution containing 20 g of salt dissolved in 100 g of water.
12. Differentiate between evaporation and distillation. When is distillation preferred?

Section B: Long Answer Questions

13. **[5 marks]** Differentiate between a true solution, a suspension and a colloid on the basis of (i) particle size (ii) stability (iii) Tyndall effect (iv) separation by filtration. Give two examples of each.
14. **[5 marks]** Describe how you would separate a mixture of sand, common salt and ammonium chloride. Write the steps in sequence with the principle used in each step.
15. **[5 marks]** Explain with a neat labelled diagram the process of simple distillation. How is fractional distillation different? Give one example where fractional distillation is used.
16. **[5 marks]** Describe with a neat labelled diagram how paper chromatography can be used to separate the coloured components (dyes) of black ink. Why do different dyes travel different distances?
17. **[3 marks]** What is centrifugation? Explain its working and give two applications.
18. **[3 marks]** Why is crystallisation preferred over evaporation to obtain pure copper sulphate from its solution? Describe the method in brief.
19. **[3 marks]** Calculate the concentration of the following solutions: (i) 5 g of sugar dissolved in 45 g of water (mass by mass %) (ii) 20 mL of ethanol dissolved in water to make 100 mL of solution (volume by volume %).
20. **[5 marks]** (a) Explain how air can be separated into its components. (b) How can you separate a mixture of two miscible liquids having different boiling points? (c) What is meant by sedimentation and decantation? Explain with an example.

Chapter 2: Inside the Atom (Atomic Structure and Models)

Section A: Short Answer Questions (2 marks each)

1. Name the scientists who discovered the electron, the proton and the neutron.
2. Write the charge and the relative mass of an electron, a proton and a neutron.
3. Define atomic number and mass number. How are they represented in the symbol of an element?
4. What are isotopes? Give two examples. Why do isotopes of an element show the same chemical properties?
5. What are isobars? Give one example. How do they differ from isotopes?
6. Write the electronic configuration of sodium ($Z = 11$), chlorine ($Z = 17$) and calcium ($Z = 20$). Also write their valencies.
7. Find the number of protons, neutrons and electrons in: (i) $^{23}_{11}\text{Na}$ (ii) $^{35}_{17}\text{Cl}$ (iii) $^{40}_{20}\text{Ca}$.

8. State any two drawbacks of Rutherford's model of the atom.
9. Define valency. Calculate the valency of magnesium ($Z = 12$) and oxygen ($Z = 8$).
10. Why are noble gases chemically unreactive? Explain with the help of neon ($Z = 10$) and argon ($Z = 18$).
11. Calculate the average atomic mass of chlorine, if it occurs in nature as ^{35}Cl (75%) and ^{37}Cl (25%).
12. An atom has 2 electrons in the K shell, 8 in the L shell and 3 in the M shell. Find (i) its atomic number (ii) its valency (iii) the name of the element.
13. Why is an atom electrically neutral? How is the mass of an atom concentrated in the nucleus?

Section B: Long Answer Questions

14. **[5 marks]** Describe Thomson's model of the atom. State its postulates and its limitations.
15. **[5 marks]** Describe Rutherford's α -particle scattering experiment with a neat labelled diagram. State the observations and the conclusions drawn from it.
16. **[5 marks]** State the postulates of Bohr's model of the atom. State the rules for the distribution of electrons in various shells (Bohr–Bury scheme).
17. **[3 marks]** Complete the table. (i) Element A: $Z = 9$, $A = 19$ (ii) Element B: $Z = 12$, $A = 24$ (iii) Element C: $Z = 17$, $A = 37$. Find the number of protons, neutrons and electrons in each, and write their electronic configurations.
18. **[3 marks]** Compare Thomson's, Rutherford's and Bohr's models of the atom on the basis of (i) the position of the electrons (ii) the nucleus (iii) the stability of the atom.
19. **[3 marks]** Name three isotopes of hydrogen. Write their mass numbers and the number of protons, neutrons and electrons in each. State any two uses of radioactive isotopes.
20. **[5 marks]** (a) Why did Rutherford's model fail to explain the stability of the atom? How did Bohr's model overcome this? (b) Draw the atomic structure of the following with the distribution of electrons: Li ($Z = 3$), Mg ($Z = 12$), Ar ($Z = 18$).

Do not copy from guides or the internet; write the answers in your own words. Best wishes for a happy and safe autumn break!

– Chemistry Department, KV INS Kalinga

PHYSICS:

- 1) Derive the equation of motion
- 2) Define uniform motion and Non uniform motion
- 3) Define acceleration, write its units
- 4) What are Scalar and Vector quantities.
- 5) Derive the equation for Potential and Kinetic energy
- 6) State and write Law of conservation of energy.
- 7) What are simple machines. What is the advantage of using Pulley.
- 8) Write about First , Second and Third type of levers with examples.

9) Answer the questions of PT 2

SOCIAL:

1. Read the following chapters :-

A) Price Puzzle: What Drives the Market. B) Oceans & Life - and write important points in your homework notebook.

2. Map pointing

Label the following on outline map of India

a) All states and UTs

b) All continents and oceans

3. Solve PT-2 question in your notebooks.

SANSKRIT:

* १) एकम् अपठितं गद्यं लिखित्वा सर्वेषां प्रश्नानाम् उत्तराणि लिखत।

* २) द्वे चित्रे निर्माय प्रत्येकस्मिन् चित्रे पञ्च संस्कृतावाक्यानि लिखत।

* ३) मञ्जूषायाः सहाय्येन पत्रद्वयं (2 Letters) लिखित्वा रिक्तस्थानानां पूर्तिं कुरुत।

CLASS-10

HINDI:

नोट-

1. कार्य को अपनी अभ्यास पुस्तिका (notebook) में कीजिए।

2. कार्य को सुंदर और साफ़ लेखें।

प्रश्न 1-अलंकार की परिभाषा बताते हुए उसके सभी प्रकारों को उदाहरण सहित समझाइए।

प्रश्न 2-संदेश लेखन क्या है? नीचे दिए गए विषय पर संदेश लेखन तैयार कीजिए।

प्रादेशिक स्तर पर आयोजित होने वाली मीटर की बाधा दौड़ में आपके मित्र को प्रथम स्थान मिला है। 100 उसे बधाई देते हुए लगभग शब्दों के संदेश लिखिए। 40

प्रश्न 3-सड़क सुरक्षा के प्रति जागरूकता हेतु ट्रैफिक पुलिस की ओर से जनहित में जारी एक आकर्षक विज्ञापन लगभग तैयार कीजिए। शब्दों में 100

प्रश्न 4-ईमेल क्या है नीचे दिए गए विषय पर ईमेल तैयार कीजिए।

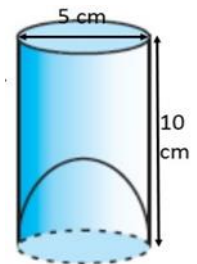
आप रागिनी/राहुल हैं। विद्यालय में नामांकन के समय आपकी जन्मतिथि गलत दर्ज हो गई है। दसवीं के पंजीकरण से पहले आप इसे सुधारवाना चाहते हैं। जन्मतिथि में सुधार हेतु निवेदन करते हुए प्रधानाचार्य को लगभग मेल लिखिए।-शब्दों में एक ई 80

प्रश्न 5-नीचे दिए गए विषयों पर टिप्पणी लिखिए)शब्द सीमा (100।
(1मन्त्र भंडारी 2) बिस्मिल्लाह खान।

MATHS:

1. A tent is in the shape of a right circular cylinder up to a height of 3 m and then a right circular cone, with a maximum height of 13.5 m above the ground. Calculate the cost of painting the inner side of the tent at the rate of ₹ 2 per square metre, if the radius of the base is 14 m. (5M)

2. A juice seller serves his customers using a glass as shown in figure. The inner diameter of the cylindrical glass is 5 cm, but the bottom of the glass has a hemispherical portion raised which reduces the capacity of the glass. If the height of the glass is 10 cm, find the apparent capacity of the glass and its actual capacity. [$\pi = 3.14$]



3. The mean of the following frequency distribution is 62.8 and the sum of all the frequencies is 50. Compute the missing frequencies f_1 and f_2 .

Class	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	5	f_1	10	f_2	7	8

4. The median of the following data is 50. Find the values of p and q , if the sum of all frequencies is 90. Also find the mode.

Marks obtained	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Number of students	p	15	25	20	q	8	10

5. A survey regarding the heights (in cm) of 50 girls of class Xth of a school was conducted and the following data was obtained. Find the mean, median and mode of the given data.

Heights (in cm)	120 – 130	130 – 140	140 – 150	150 – 160	160 – 170
No. of Girls	2	8	12	20	8

6. 4 Bells toll together at 9.00 am. They toll after 7, 8, 11 and 12 seconds respectively. How many times will they toll together again in the next 3 hours?

7. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information answer the following questions

- Find the fixed number increase in production of factory every year ?
- What is the production during first year ?

- (iii) (a) Find the total production in first 3 years

OR

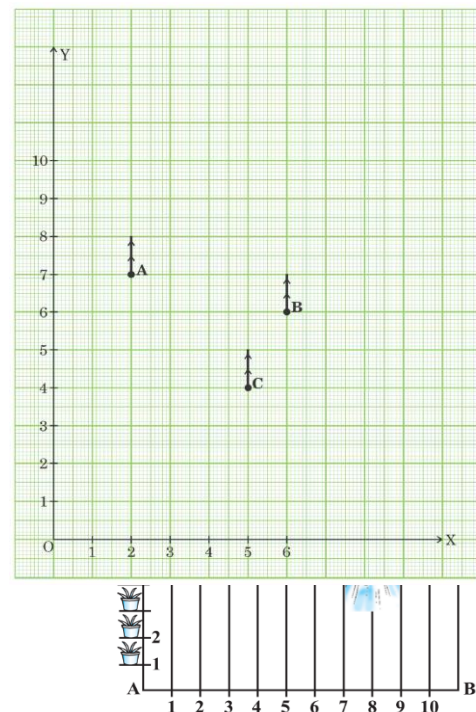
Find the n th term in terms of n

8. Find the points on the x -axis which are at a distance of $2\sqrt{5}$ from the point $(7, -4)$. How many such points are there?

9. If A and B are $(-2, -2)$ and $(2, -4)$ respectively, find the coordinates of

P such that $AP = \frac{3}{7}AB$ and P lies on the line segment AB

10. To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in Figure. Niharika runs $\frac{1}{4}$ th of the distance AD on the 2nd line and posts a green flag. Preet runs $\frac{1}{5}$ th the distance AD on the eighth line and posts a red flag. Assume A as the origin AB along x -axis and AD along y -axis, answer the following questions:



Based on the above information answer the following questions

- (i) Find the coordinates of the green flag.
 - (ii) Find the distance between both the flags?
 - (iii) (a) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?
- OR

(b) If position of green flag is named as P and that of red flag as Q, then find the ratio in which R $(10, \frac{55}{3})$ divides the join of PQ.

11. In an examination hall, students are seated at a distance of 2 m from each other, to maintain the social distance due to CORONA virus pandemic. Let three students sit at points A, B and C whose coordinates are $(4, -3)$, $(7, 3)$ and $(8, 5)$ respectively.



- (i) If an invigilator at the point D, lying on the straight line joining B and C such that It divides the distance between them in the ratio of $1 : 2$. Then find the coordinates of D. 1m
- (ii) Find the ratio in which B divides the line segment joining A and C. 2m
- (iii) Find the midpoint of AB. 1m

12. Find the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points A $(2, -2)$ and B $(3, 7)$

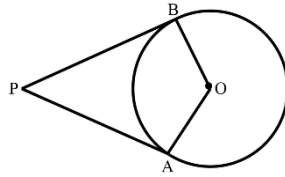
13. The line segment joining the points A $(-4, 5)$ and B $(4, 5)$ is divided by the point P such that $AP : AB = 2 : 5$. Find the coordinates of the point P.

14. Find the ratio in which P $(4, k)$ divides the line segment joining the points A $(2, 3)$ and B $(6, -3)$. Find k

15. If A $(-2, -1)$, B $(a, 0)$, C $(4, b)$ and D $(1, 2)$ are the vertices of a parallelogram, find the values of a and b

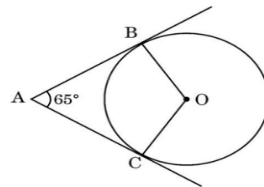
16. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

17. In the given figure, PA and PB are the tangent segments to a circle with centre O. Show that the points A, O, B and P are concyclic.



18. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.

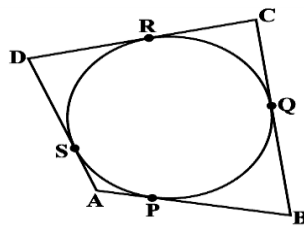
19. In the given figure, O is the center of the circle. AB and AC are tangents drawn to the circle from point A. If $\angle BAC = 65^\circ$, then find the measure of $\angle BOC$.



20. Prove that the parallelogram circumscribing a circle is a rhombus.

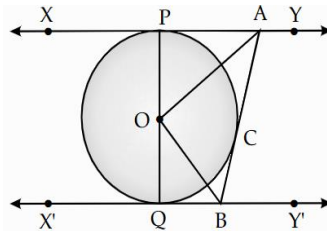
21. Prove that the tangents drawn to a circle from an external point are equal.

22. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$.



23. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

24. In the figure XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B, prove that $\angle AOB$ is a right angle.



ENGLISH:

SOLVE PAPERS

KENDRIYA VIDYALAYA SANGATHAN HYDERABAD REGION

SAMPLE QUESTION PAPER 2024 – 25

CLASS-X

ENGLISH LANGUAGE AND LITERATURE (Code No. 184)

Time allowed: 3 Hrs.

Maximum Marks: 80

General Instructions:

- a) 15-minute prior reading time allotted for question paper reading.
- b) The Question Paper contains THREE sections – READING, GRAMMAR & WRITING and LITERATURE.
- c) Attempt questions based on specific instructions for each part.

SECTION A: READING SKILLS (20 marks)

I. Read the passage given below:

10 Marks

1. In a new finding, climate change has now become a national issue in America as a recent study has deduced that warming induced drought in the Middle East is leading to increase conflicts over food and water, leading to its consequences on America and the world. The accelerating rate of climate change poses a severe risk to national security and acts as a catalyst for global political conflict. This is the conclusion drawn up by US experts, according to a government report. At the US Centre for Naval Analyses, the Military Advisor – Board found that climate change had induced drought in the Middle East and Africa. The lack of food and water was affecting the populations of these countries to take recourse to extreme measures. This had escalated long-standing ethnic tensions into violent clashes in the effected countries. In addition,, the report predicted that an increase in catastrophic meta conditions worldwide would create more demand for American troops, even as flooding and disastrous weather could damage naval ports and military bases.

2. According to official findings, The report signaled that it would influence American foreign policy as well. The report vitalises situations caused by the massive dislocation or massive drying up of the waters of the Nile or of the major rivers of India and China. Pentagon officials also feel that the reports would affect military of their country as climate change is having an impact on national security, whether by increasing global instability or by opening the Arctic or by increasing sea level and stop surge close to coastal installations. This is the first major study to draw the link between climate change and national

security. Thus, American leaders are delivering major speeches wherein they are linking up climate change with that of national security. New regulations would also be put in place to cut pollution from coal-fired power options.

3. The report follows a recent string of scientific study that warned that the effects of climate change are already occurring and that more Hooding, droughts, extreme storms, food and water shortages, and damage to infrastructure will occur in the future. There is thus, a link in some quarters between rising sea waters and terrorism. These effects are stress multipliers that will aggravate stressors abroad, such as poverty, environmental degradation, political instability and social tensions.

On the basis of your understanding of the passage, answer the questions that follow:

1) In paragraph 1, what does the phrase, *‘an increase in catastrophic weather conditions worldwide would create more demand for American troops’* emphasise? 1 marks

2) What is the tone of the writer in the given lines a paragraph 3? Rationalize your response in about 40 words. 2 marks

These effects are stress multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability and social tensions.

3) The writer mentions ‘environmental degradation’ in paragraph 3. Which of the following is an example of this? 1 mark

- a. The invention of new renewable energy technologies.
- b. The expansion of protected natural reserves.
- c. The destruction of forests and loss of biodiversity.
- d. The improvement of air quality through stricter emissions regulations.

4) Select the option that depicts set of synonyms as used in the passage. 1 mark

- a. Catastrophic and disastrous
- b. Deduced and induced
- c. Create and change

d. All of the above

5) Complete the sentence appropriately.

1 mark

In the line, *this had escalated longstanding ethnic tensions into violent clashes in the affected countries.* The word 'escalated' refer to _____.

- a. The reduction of ethnic tensions to a more manageable level.
- b. The sudden resolution of conflicts through peaceful negotiations.
- c. The increase in intensity and severity of ethnic tensions, leading to violence.
- d. The stabilization of ethnic relations through diplomatic efforts.

6) Support the writer's assertion that climate change contributes to global conflicts and security risks in about 40 to 50 words.

2 marks

7) State whether following statement is True or False.

1 mark

The passage displays an example of narrative text.

8) Complete the following with the correct option from the two given.

1 mark

Climate change-induced conflicts are like sparks in a dry forest because _____.

- a. They can quickly escalate into widespread and intense problems.
- b. They always lead to immediate unpredictable solutions.

II. Read the passage given below:

10 Marks

(1) The epidemic of drug abuse in young generation has assumed alarming dimensions in India. Changing cultural values, increasing economic stress and dwindling supportive bonds are leading to initiation of drug abuse.

(2) Drug addiction causes immense human distress and the illegal production and distribution of drugs have spawned crime and violence worldwide. June 26 is celebrated as International Day against Drug Abuse. It is an exercise undertaken by the world community to sensitize the people in general and the youth in particular to the menace of drugs.

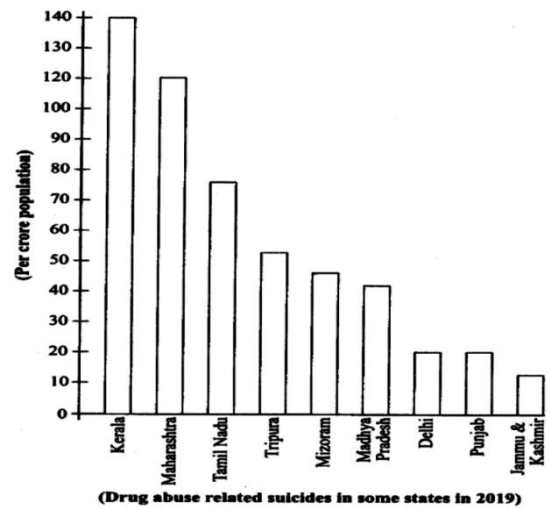
(3) The pattern of drug abuse in India has undergone changes over the years. Use of drugs like charas, ganja, and opium was a tradition in some places of India, where they were mainly used for ritualistic purposes.

(4) According to a UN report, one million heroin addicts are registered in India, and unofficially there are as many as five million. Inhalation of heroin alone has given way to intravenous drug use that too in combination with other sedatives and painkillers. This has increased the intensity of the effect, hastened the process of addiction and complicated the process of recovery.

(5) A large number of people commit suicide due to drug/alcohol/addiction. Drug abuse is a complex phenomenon, which has various social, cultural, biological, geographical, historical and economic aspects. The disintegration of the old joint family system, absence of parental love and care in modern families where both parents are working, decline of old religious and moral values etc. lead to a rise in the number of drug addicts who take drugs to escape hard realities of life.

(6) Drug abuse is primarily due to the nature of the drug abused, the personality of the individual and the addict's immediate environment. The processes of industrialisation, urbanisation and migration have led to loosening of the traditional methods of social control rendering individual vulnerable to the stresses and strains of modern life. Drug abuse caused a detrimental impact on the society.

(7) It has led to increase in the crime rate. According to the World Health Organisation report 2002, 8.9% of the total burden of disease is due to use of psychoactive substances. Adolescent drug abuse is one of the major areas of concern in adolescent and young people's behaviour. It is estimated that in India, by the time most boys reach ninth grade, about 40% of them have tried at least one of the substances of abuse nature.



Based on your understanding of the passage, answer the questions given below:

(i) Drug abuse in young generation is escalating in an alarming rate. Justify the factors for this in 40 – 50 words. 2 marks.

(ii) What is/are the adverse impact(s) of drug addiction? 1 mark

- | | |
|-----------------------------------|---------------------------------|
| (a) Enormous human distress | (b) Illegal production of drugs |
| (c) Illegal distribution of drugs | (d) All of these. |

- (iii) According to the graph, how many people out of one crore committed suicide due to drug addiction in Maharashtra in 2019? 1 mark
- (a) Nearly 142 (b) Nearly 122
(c) Nearly 132 (d) Nearly 112
- (iv) According to a UN report, how many heroin addicts are registered in India? 1 mark
- (a) One lakh (b) Ten lakh
(c) One crore (d) Ten crore
- (v) Based on your understanding of the passage, choose the option that lists the causes of the rise in the number of drug addicts. 2 marks
- Disintegration of joint family system
 - Absence of parental love
 - Decline of old religious and moral values
 - Absence of enough money
 - Stress in modern life
- (a) 1,2 and 4 (b) 2, 3 and 5
(c) 2, 3 and 4 (d) 1,2 and 3
- (vi) In the line “_____ drugs have spawned crime,” the word ‘spawned’ DOES NOT refer to: 1 mark
- (a) give a rise to something (b) follow an old ritual
(c) provoke someone/something (d) trigger a particular action or situation
- (vii) As per the WHO, what percentage of the total burden of disease is due to the use of drugs? 1 mark
- (a) 10% (b) 5.6%
(c) 8.9% (d) 10.2%
- (viii) Choose the option that lists the correct answers for the following: 1 mark
- Peter, a seventeen-year-old student believes that drugs can help to improve his focus in school. What kind of a person is Peter?
 - Mr Paul is a sports-person. He often consumes drugs to boost his performance. What kind of a person is Mr Paul?
- (a) 1 is a drug addict and 2 is not a drug addict
(b) 1 is not a drug addict and 2 is also not a drug addict
(c) 1 is a drug addict and 2 may/may not be a drug addict
(d) 1 may/may not be a drug addict and 2 often consumes drugs.

SECTION B: GRAMMAR & WRITING SKILLS (20 Marks)

GRAMMAR 10 Marks

III. Attempt ANY TEN of the following questions as directed:

10x1=10

- (i) Fill in the blank with the correct option though complete the opening line of a formal letter:
Dear Sir,
This is with reference to the committee’s letter of recommendation which _____ the proposals for the upcoming conference on sustainable development.
- a) Outlined
b) outlines
c) will outline
d) has outlined
- (ii) Read the dialogue given below and complete the report that follows:-
- Father : Where will you go tomorrow?
 - Son : I will go to the museum.
- The father asked his son _____(a)_____. The son replied that he would go the next day.
- (iii) Identify the error and supply correction to the following sentence from a company’s advertising campaign:
Experience a most unique and breathtaking view of the city’s skyline from our rooftop bar.

Option No.	Error	Correction
A	from	by
B	a most	the most
C	the city	a city

of a national daily expressing your views on the importance of online safety education in schools and colleges. Propose methods to raise awareness about cyber threats.

OR

- B. You are Manoj Raman, Principal of Geeta Public School, Baradari, Jalandhar. You came across an advertisement of a landscaping firm specialising in building greenhouses and also developing golf courses. Write a letter to the manager of Green With Us, Enquiring about their services and other discounts.

V. Attempt ANY ONE from A and B given in 100 -120 words :

5 Marks

A. Read the given details of Sports Complex for your Residential area.

- A multi sport field suitable for soccer, cricket and football.
- A modern indoor gym with equipment for various fitness activities.
- Courts for basketball and tennis.
- A running track and a dedicated area for yoga and aerobics.
- Shaded seating areas for spectators and participants.
- Ample parking and accessible facilities.

Analyse the details and write an analytical paragraph about the suitability of the complex. Focus on factors such as accessibility, versatility, safety and overall community impact.

OR

B. Gurmeet Kaur is an aspiring candidate for a public funded Engineering College in the suburbs. She belongs to a nearby village, has minimal technological skills and exposure, has the required cut off percentage and is looking for a complete or partial scholarship.

Write an analytical paragraph, analysing her SWOT notes to support your stand on whether she should join/ not join the college.

STRENGTH

- Strong curriculum
- Quality faculty
- Vibrant activity clubs
- Green location
- Close proximity to residential areas

OPPORTUNITIES

- Practise based research
- Partnership with professional organisations
- Strong alumni
- Acclaimed student exchange programme with foreign countries

WEAKNESS

- Lack of diversity
- Students' behavioural problems
- No hostel facility
- Slow repair and maintenance work
- Underutilization of IT services

THREAT

- Lack of publicity in areas of excellence
- Public perception towards funded colleges
- Declining students' interest towards technical subjects

SECTION C: LITERATURE (40 Marks)

VI. Reference to the context:

10

Marks

1. Attempt ANY ONE of the two extracts given:

1x5=5

A. Read the following extract and answer the questions that follow:

'It was impossible for him to gather together the hundred pesos, so he was able to send the farmer only a little more than half. He put the money in an envelope addressed to Lencho and with it a letter containing only a single word as a signature: God.'
(A Letter to God)

(i) What effect does the experience, as described in the lines bellow from the later part of the story have on Lencho?

1 mark

Lencho showed not the slightest surprise on seeing the money; such was his confidence but

- a. Exhilarates
- b. Overwhelms
- c. Energises

d. Anger

(ii) How does the author's use of language enhance the narrative technique in the paragraph? 1 mark

(iii) Fill in the blank with the correct word from the bracket.

The use of the word 'impossible' adds to a sense of _____ in the extract. (difficulty/ ease)

(iv) Why is it fair to say that the postmaster was a representative of God?

Answer in about 40 words.

1 mark

OR

B. *I was still a thief when I met Anil. And though only 15, I was an experienced and fairly successful hand. Anil was watching a wrestling match when I approached him. He was about 25-a tall, lean fellow-and he looked easy-going, kind and simple enough for my purpose. I hadn't had much luck of late and though I might be able to get into the young man's confidence. 'You look a bit of a wrestler yourself,' I said. A little flattery helps in making friends.*

i. Who is the I and what was he a successful hand at? Answer in 40 – 50 words. 2 marks

ii. Anil looked easy-going, kind and simple to the narrator. Which of the given characteristics would NOT fit in with the description? 1 mark

a) Compassionate

c) Intricate

b) Blithe

d) Meek

iii. Based on the line, 'A little flattery helps in making friends.' Choose the option that displays the quote closest in meaning. 2 marks

a) Imitation is the best form of flattery; people generally understand that my comedy is not intended to hurt anybody.

b) I know imitation is the highest form of flattery, but stealing one's identity is totally different.

c) Nothing is so great an example of bad manners as flattery. If you flatter all the company, you please none; if you flatter only one or two, you offend the rest.

d) Only one may define flattery as a base companionship which is most advantageous to the flatterer.

2. Attempt ANY ONE of the given two extracts:

5 Marks

*The trees inside are moving out into the forest,
the forest that was empty all these days
where no bird could sit
no insect hide
no sun bury its feet in shadow
the forest that was empty all these nights
will be full of trees by morning.*

i. Fill the blank with **one** word:

1 mark

The poem describes how the trees are moving out to the forest. Their action symbolizes a sense of _____.

ii. What is the most likely assumption that can be formed by the speaker's observation of the trees moving out? 1 mark

iii. Select the option that applies the same rhyme scheme as the lines of the given extract. 1 mark

a) This bird so small and sweet, green,
Sings aloud in the morning
Perched on a branch green,
Chirp, chirp, tweet, tweet.

b) Perched on a branch
This bird so sweet and lean
Sings aloud in a voice
Chirp, chirp, tweet, tweet.

c) This bird sings without a care,
Perched on a branch green
A song with the world to share,
With its feelings so keen.

d) This bird so small and

Sings aloud in the morn
Perched on a green branch
Singing its own melody.

- iv. Imagery is exemplified in these lines. Justify.

2 marks

OR

*But I can get a hair-dye
And set such colour there,
Brown, or black, or carrot,
That young men in despair
May love me for myself alone
And not my yellow hair.*

- i. Examine the portrayal of Anne Gregory in the given lines. 2 marks
ii. Complete the following suitably. 1 mark

The lines from the poem implies that Anne is _____ .

1. Trying to fit in societal standards
2. Trying to change the societal standards
3. Determined to go against the set beauty standards
4. Determined to go along with the set beauty standards
 - a. Option 1 & 2
 - b. Option 2 & 3
 - c. Option 2 & 4
 - d. Option 1 & 4

- iii. What kind of atmosphere is created through these lines? 1 mark

1. Urgency
2. Excitement
3. Uncertainty
4. Mystery
5. Happiness
 - a. 1 and 3
 - b. 1 and 4
 - c. 1, 2 and 3
 - d. 4 and 5

- iv. What kind of mood and tone is depicted in the phrase “young men in despair”? 1 mark

VII. Answer ANY FOUR of the following in about 40-50 words.

4x3= 12

- a) Anne Frank had the ability to handle challenges with humour. Evaluate with reference to the chapter ‘From the Diary of Anne Frank’.
- b) How does the choice of the words ‘perish’ and ‘destruction’ impacts the imagery associated with both fire and ice and influence the theme of the poem?
- c) How does Valli’s decision to take the bus ride alone reveal insights about the tendency of today’s generation to take actions?
- d) What kind of picture is painted through the line, ‘*Lord and master, give me the medicine that will cure my boy?*’
- e) Peculiar behaviours are a characteristic of Otters. Discuss with respect to ‘Mijbil, the Otter’.

VIII. Attempt any TWO of the following questions in 40-50 words.

2x3=6

- (a) What can the interaction between Ausable and the intruder in ‘The Midnight Visitor’ teach us about the importance of quick thinking and resourcefulness in overcoming dangerous situations?
- (b) Curiosity and scientific approach will influence the way future generations and innovation in their fields. Justify in relation to the chapter ‘The Making of a Scientist’.
- (c) How might Madame Loisel's life have changed if she had embraced her modest circumstances and recognized the value of her own identity, rather than desiring a life of wealth and luxury, as depicted in ‘The Necklace’?

IX. Answer ANY one of the following questions:

1x6=6

A. How does the Goan proverb “Our elders are often heard reminiscing nostalgically, ‘the good old Portuguese days, and the loaves of bread’” reflect the cultural importance of traditional values and skills, as seen in the chapter ‘A Baker from Goa’?

OR

B. How does the quote “The bird fights its way out of the egg” illustrate the value of perseverance and the importance of overcoming challenges, as seen in the lessons from ‘The First Flight’?

X. Answer ANY one of the following questions:

1x6=6

A. “A simple act of kindness can change a life,” Elucidate this, citing references from the chapters ‘Bholi’ and ‘The Thief’s Story’ highlighting the impact of trust and compassion on personal transformation?

OR

C. Half knowledge is dangerous. Critically examine the given statement in reference to the chapter ‘The Book that Saved the Earth’.

MODEL PAPER 2

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION

SAMPLE PAPER I

Class 10 - English Language and Literature

Time Allowed: 3 hoursMaximum Marks: 80

General Instructions:

Read the instructions very carefully and strictly follow them :

1. This question paper comprises 11 questions. All questions are compulsory.

2. The question paper contains THREE sections -

◦ Section - A : Reading Skills

S

◦ Section - B : Grammar and Creative Writing Skills ◦ Section - C :

e

Literature Text Book

c

3. Attempt questions based on specific instructions for each part.

t

ion A - Reading Skills

1. Read the following passage and answer the questions that follow:

1. Mankind's fascination with gold is as old as civilization itself. The ancient Egyptians held gold in high esteem. Gold had religious significance for them, and King Tutankhamen was buried in a solid gold coffin 3300 years ago. The wandering Israelites worshipped a golden calf, and the legendary King Midas asked [10] that whatever he touched be turned into gold.

2;.Not only is gold beautiful, but it is virtually indestructible. It will not rust or corrode. Gold coins and products fabricated from the metal have survived undamaged for centuries. Gold is extremely easy to work with. One ounce, which is about the size of a cube of sugar, can be beaten into a sheet nearly 100 square feet in size, and becomes so thin that light can pass through it. An ounce of gold can also be stretched into a wire 50 miles long. Gold conducts electricity better than any other substance except copper and silver, and it is particularly important in modern electronic industry.

2. People have always longed to possess gold. Unfortunately, this longing has also brought out the worst in human character. The Spanish conquerors robbed palaces, temples and graves and killed thousands of people in their ruthless search for gold. Even today, the economy of South Africa's gold mines depend largely on the employment of black labourers who are paid about 40 pounds a month, plus boarding and lodging. They work in conditions that can only be described as cruel. About 400 miners die in South Africa each year.

3. Much of the gold's value lies in its scarcity. Only about 80,000 tons have been mined in the history of the world. All of it can be stored in a vault 60 feet square, or a super tanker. Great Britain was the first country to adopt the gold standard, when the Master of the Mint, Sir Issac Newton, established a fixed price for gold in 1717. The discovery of gold in the last half of the nineteenth century in California, (1848) and later in Australia and South Africa changed everything. Before the discovery, there wasn't enough gold around for all the trading nations to link their currencies to the precious metal.

4. An out-of-work prospector named George Harrison launched South Africa into the gold age in 1886 when he discovered the metal in a farm near what is now Johannesburg. Harrison was given a 12 pounds reward by the farmer. He then disappeared and was eaten by a lion.
5. One of the biggest gold mining areas in the Soviet Union is the Kolyma River region, once infamous for its prison camp. The camp has gone, but in a way nothing has changed. Many ex-prisoners have stayed on to work in the mines and are supervised by ex-guards.
6. Despite the current rush to buy gold, 75 percent of the metal goes into making jewellery. Italy is the biggest consumer of gold for this purpose, and many Italian jewellers even tear up their wooden floors and burn them to recover the tiny flecks of gold. Historically, the desire to hoard gold at home has been primarily an occupation of the working and peasant classes, who have had no faith in paper money. George Bernard

Shaw defended their instincts eloquently, "You have to choose between trusting the natural stability of the honesty and intelligence of the members of the government," he said "and with due respect to these gentlemen, I advise to vote for gold."

Based on your understanding of the passage, answer the questions given below. (10)

- i. According to the passage, which of the following statements is NOT true? (1)
 - a. Gold is the best conductor of electricity.
 - b. Apart from gold, copper and silver are good conductors of electricity.
 - c. Gold can be easily beaten, hence it is easy to work with.
 - d. Gold plays an important role in the modern electronics industry.
- ii. Based on your reading of the text, list 2 reasons why the writer says that,
Not only is gold beautiful but it is virtually indestructible. (2)
- iii. How were the black labourers exploited? Answer in around 40 words. (2)
- iv. Select the text that displays what the writer projects, with reference to the following.
The wandering Israelites worshipped a golden calf _____. (1)
- v. Complete the following with the phrase from paragraph 1: (1)

Opinion	Reason
	King Tutankhamen was buried in a solid gold coffin 3300 years ago.

- vi. Who launched South Africa into the gold age? (1)
 - a. Issac Newton
 - b. George Harrison
 - c. George Bernard Shaw
 - d. A farmer
- vii. Select the option that corresponds to the following:
The ancient Egyptians and the modern electronic industry both hold gold in high esteem. (1)
 - a. The hardworking student came first because of his diligent practice.
 - b. Honesty is underrated whereas strategy is appreciated.
 - c. The vibrant colours made the interiors look luminous.
 - d. The steaming food was both appetizing and tasty.

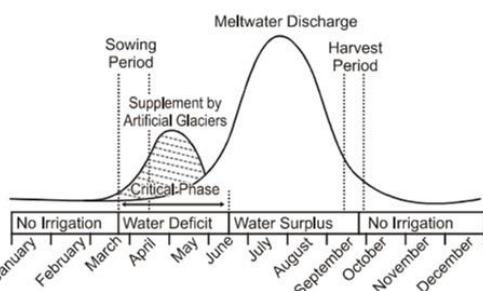
viii. Supply one point to justify the following:

The desire to hoard gold at home has been primarily an occupation of the working and peasant classes. (1)

2. **Read the extract given below:**

[10]

1. Necessity is indeed the mother of invention. When areas in and around Leh began to experience water shortages, life didn't grind to a halt. Why? Because a retired civil engineer in the Jammu and Kashmir Government came up with the idea of artificial glaciers.
2. Ladakh, a cold desert at an altitude of 3,000-3,500 meters above sea level, has a low average annual rainfall rate of 50 mm . Glaciers have always been the only source of water. Agriculture is completely dependent on glacier melt, unlike the rest of river/monsoon-fed India. But over the years, with increasing effects of climate change, rainfall and snowfall patterns have been changing, resulting in severe shortage and drought situations. Given the extreme winter conditions, the window for farming is usually limited to one harvest season.
3. It is located between the natural glacier above and the village below. The one closer to the village and lowest in altitude melts first, providing water during April-May, the crucial sowing season. Further, layers of ice above melt with the increasing temperature, thus ensuring continuous supply to the fields. Therefore, farmers have been able to manage two crops instead of one. It costs about 1,50,000 and above to create a glacier.
4. Fondly called the glacier man, he has designed over 15 artificial glaciers in and around Leh since 1987. In recognition of his pioneering effort, he was conferred the Padma Shri by The President of India.
5. There are a few basic steps followed while creating an artificial glacier. River or stream water at high altitude is diverted to a shaded area of the hill, facing north, where the winter sun is blocked by a ridge or a mountain range. At the start of winter i.e., in November, the diverted water is made to flow on sloping hills facing distribution channels. Stone embankments are built at regular intervals which impede the flow of water, making shallow pools which freeze, forming a cascade of ice along the slope. Ice formation continues for 3-4 months resulting in a large accumulation of ice which is referred to as an 'artificial glacier'.



Based on your questions below: (10)

i. Infer one reason for the following, based on information in paragraph 1. (1)
Areas in and around Leh began to experience water shortage but life didn't grind to a halt.

ii. Select from the passage the appropriate option to fill in the blanks: (1)
Agriculture is completely dependent on _____ unlike the rest of river/monsoon-fed India.

- a. rainfall pattern
- b. climate change
- c. glaciers melt
- d. extreme winter conditions

Write any two steps followed while creating the glaciers. (2)

List two reason why artificial glaciers seem the best option. (2)

Complete the following analogy correctly with a word/phrase from paragraph 3: (1)

Select the correct option to complete the following sentence: At the start of winter the diverted water is made to flow _____. (1)

- e. on sloping hills facing distribution channels.
- f. on high altitude.
- g. on ice-cold water level.
- h. on mountain range.

III. Fill in the blank by selecting from the passage the correct option: (1)

The _____ have been the only source of water in areas in and around Ladakh.

- i. glaciers
- j. rivers
- k. streams
- l. water springs

The word 'located' in paragraph 3 means _____. (1)

SECTION B GRAMMAR

3. Complete ANY TEN of twelve of the following tasks, as directed

[10]

- i. Fill in the blank by using the correct form of the word in the bracket, for the given portion of a letter: Sir [1]
We _____ (purchase) office furniture from your showroom on 5th October vide Invoice No. 12334.

- ii. Identify the error in the given sentence, from an e-zine report and supply the correction. Anxiety is a manifestation of the mind being afraid of venture into the unknown. [1]
Use the given format for your response.

error	correction

- iii. Read the conversation between a nurse and a patient. Complete the sentence by reporting the reply correctly. Nurse: Has the wound started to heal? [1]

Patient: No, it is still bleeding.

The nurse while trying to find out how the patient was feeling, asked whether the wound had started to heal to which the patient replied _____.

- iv. Select the correct option to complete the narration of the dialogue between the Postmaster and Rama. [1]

Postmaster: Rama, show me a document to verify your identity.

Rama: Sure, I will show you my driving licence.

The postmaster asked Rama to show him a document to verify her identity to which Rama affirmed and said

- a) this is her driving licence.
- b) this was her driving licence.
- c) that was her driving licence.
- d) that she would show him her driving licence.

- v. Fill in the blank by choosing the correct option. [1]
Although she thought she knew _____ (many / much / whole) of the subject, the teacher asked a few details she hardly remembered.

vi. Identify the error in the given sentence that shows grandmother and grandson relation and supply the [1]

[6]

[6]

correction.

My grandmother and I were good friends. He used to wake me up early and get me ready for the school.

Use the given format for your response.

error	correction

vii Identify the error and supply correction for the given sentence from a speech by an employee: We [1]

live in an ever changed world and in order to keep up and become successful, continuous education is a must.

Use the given format for your response.

Error	Correction

viii.The young soldier _____that he _____in the battle.

[1]

a) fears / is killed

b) feared / was killed

c) fears / will be killed

d) will fear / would be killed

Report the dialogue between two friends Seema and Anu, by completing the sentence:

ix.

Seema: What brings you here?

[1]

Anu: I am going to Dr. Sen's house.

In response to the question about what brought Anu there, Anu says _____.

"He is coming today," the mother said.

She said that he _____.

x.

[1]

a) came the previous day

b) was coming the day before

c) would come the next day

d) was coming that day

- xi. Complete the line from a self-awareness song, by filling the blank with the correct option. [1]

The angel whole and _____The next right It came again with a great
wakening light.

And showed the names whom love of God had blest,

And lo! Ben Adhem's name _____all the rest.

- A. has vanished, led
- B. vanishes, leads
- C. vanished, led
- D. was vanishing, had led

- xii. Identify the error and supply the correction, for the following: [1]

surat

HI LIFE EXHIBITION

You're last chance to make a fashion statement

LAST DAY TODAY

Use the given format for your response.

error	correction

SECTION B CREATIVE WRITING SKILLS

1. Your school won an award for maintaining cleanliness in and around your school. The whole school worked towards it with dedication. Write a letter to the editor of a newspaper mentioning the steps that your school took to create awareness of cleanliness. You are School Captain, Shan Sharma, Government Senior Secondary School, New Delhi.

2. Your school won an award for maintaining cleanliness in and around your school. The whole school worked [5] towards it with dedication. Write a letter to the editor of a newspaper mentioning the steps that your school took to create awareness of cleanliness. You are School Captain, Shan Sharma, Government Senior Secondary School, New Delhi.

OR

The condition of the public park in your locality is miserable. Write a letter to the editor of a local newspaper with the help of the points given below. You are Ranjit/Reshma.

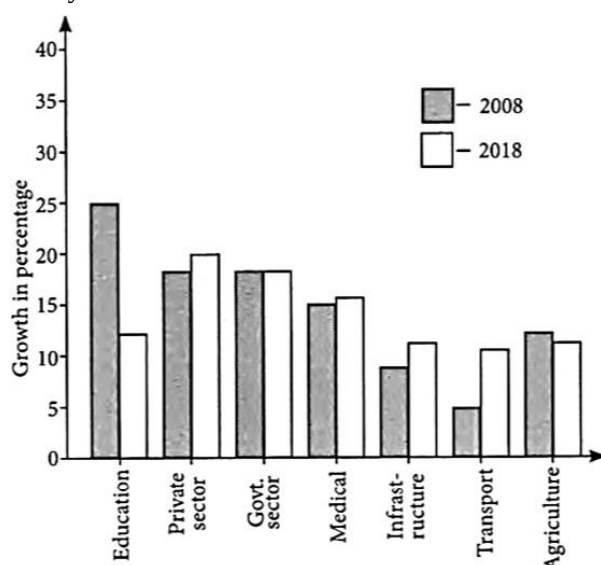
Poorly managed parks
 Heaps of garbage everywhere
 Boundary wall is broken
 Very dirty animals resting there

3. The table below displays data about the number of gyms and the number of members in your city over the past [5] decade. Write a paragraph analysing the given information:

Year	No. of Gyms	No. of Members
2010	24000	28000
2012	30000	28000
2014	30000	30000
2016	40000	35000
2018	45000	45000
2020	30000	28000
2022	35000	36000

OR

Write an analytical paragraph based on the double bar graph showing the percentage growth in different sectors in a developing country from the year 2008 to 2018.



SECTION C - LITERATURE

4. Read the given extracts and answer the questions for ANY ONE of the two, given. [5]

(A) Read the following extracts and answer the question/complete the sentences that follow: [5]

”You are disappointed”, Ausable said wheezily over his shoulder. “You were told that I was a secret

agent, a spy, dealing in espionage and danger. You wished to meet me because you are a writer, young and romantic. You envisioned mysterious figures in the night, the crack of pistols, drugs in the wine.”

i. What makes Ausable comment to Fowler "You are disappointed"? (1)

ii. Why did 'he' want to meet Ausable? (2)

iii. Complete the given sentence: (1)

Fowler was disappointed to meet Ausable because _____.

i. What is the meaning of the word **Espionage**? (1)

a. Finding out secret information

b. Dealing with careless behaviour

c. Ignorant about certain things

d. Dealing indifferently

(B)

Read the passages given below and answer the questions that follow:

[5]

The following Sunday Lencho came a bit earlier than usual to ask if there was a letter for him. It was the postman himself who handed the letter to him while the postmaster, experiencing the contentment of a man who has performed a good deed, looked on from his office. Lencho showed not the slightest surprise on seeing the money; such was his confidence - but he became angry when he counted the money. God could not have made a mistake, nor could he have denied Lencho what he had requested.

i. Why was Lencho not surprised on seeing the money? Answer in about 40 words. (2)

ii. Complete the sentence with the appropriate option. Lencho became angry when he got the money because _____. (1)

a. He was only given 70 pesos when he had asked for 100 pesos.

b. He wanted more money.

c. He wanted money directly from God.

d. He understood that the postmaster collected money for him.

i. Identify the irony used in the above stanza. (1)

ii. State any one inference about the postmaster from the given context: It was the postman himself who handed the letter to him while the postmaster, experiencing the contentment of a man who has performed a good deed, looked on from his office. (1)

5. **Read the given extracts and answer the questions for ANY ONE of the two, given.**

[5]

(A)

Read the extracts given below and answer the questions that follow:

[5]

My head is full of whispers which
tomorrow will be silent. Listen. The
glass is breaking.

The trees are stumbling forward
into the night. Winds rush to meet them. The
moon is broken like a mirror,
its pieces flash now in the crown of
the tallest oak.

i. Why would the whispers be silent tomorrow? (1)

ii. The forest undergoes tremendous transformation overnight. Discuss with reference to the poem "The Trees" (2)

iii. Which word in the stanza means the same as 'quiet'? (1)

- iv. Which poetic device has been used in the last line 'its pieces flash now in the crown of the tallest oak.' (1)
- Simile
 - Alliteration
 - imagery
 - Personification

(B) Read the extract given below and answer the questions that follow:

[5]

Belinda is as brave as a barrel full of bears And
Ink and Blink chase lions down the stairs, Mustard
is as brave as a tiger in a rage,
But Custard keeps crying for a nice safe cage.

- Pick the option that does not display a simile from the extract. (1)
 - as brave as a barrel full of bears
 - chase lions down the stairs
 - brave as a tiger in a rage
 - none of the above
- Fill in the blank with one word. The coward behaviour of _____ animal is described here in these lines. (1)
- How does the poet describe the pets of Belinda in this extract? (2)
- A hyperbole is a poetic device where the poet purposely and obviously exaggerates to an extreme. Comment on the hyperbole from the extract. (1)

6. Answer ANY FOUR of the following five questions, in about 40-50 words

[12]

- How is bread an important part of life in Goa? [3]
- How does the poem point to the cruelty of animals in captivity? Answer in the context of the poem **A Tiger in the Zoo**. [3]
- What argument do Lomov and Natalya give over the superiority of their dogs, Guess and Squeezer? (The Proposal) [3]
- What tells you that Anne loved her grandmother? [3]
- Write the sum and substance of the poem Fire and Ice. [3]

7. Answer ANY TWO of the following three questions, in about 40-50 words.

[6]

- Why does Mrs. Pumphrey not deserve to keep a pet? [3]
- You've read the quote: **A teacher affects eternity. He can never tell where his influence stops.** In the context of this statement, comment on the role of Bholi's teacher in her life. [3]
- What did Griffin do at the London store? [3]

8. Answer ANY ONE of the following two questions, in about 100-120 words

[6]

- (i) All parental acts are for the betterment of the children. Justify this statement by taking points from the lesson- "The First Flight".
- (ii) Both trees and Nelson Mandela are symbols of freedom, but in different ways. Trees represent the natural freedom that we all yearn for, while Nelson Mandela represents the hard-won freedom that is possible when we stand up for what we believe in.
- Assume they both meet each other and have a conversation about freedom.

You may begin like this

Nelson Mandela: Greetings, trees. It is an honour to speak with you today.

Trees: It is an honour to speak with you as well, Nelson Mandela.

Nelson Mandela: I am interested in hearing your thoughts on freedom.

9. Answer ANY ONE of the following two questions, in about 100-120 words.

[6]

I. Imagine you're one of the columnists in a magazine. People write to you about their issues, seeking your advice.

Matilda writes to you about the guilt she feels for having lost a necklace and how it changed the course of her life and her husband's. What would be your advice to her?

II. Hari Singh says- **He knew it but neither his lips nor his eyes showed anything.** Anil successfully addressed the situation by not addressing it at all. Elaborate based on your reading of The Thief's Story.

SOCIAL:

1. Write note on any three points given below (about 120 words each)

- a. Bright future of Solar Energy in India
- b. Industrial Pollution and steps to be taken to minimize it
- c. Role of banks in Indian Economy
- d. Mahatma Gandhi and Non co-operation movement.

2. Map pointing

Label the following on outline map of India

1. Coal mines – Raniganj , Bokaro, Korba, Singrauli, Singareni, Neyveli , Jharia
2. Oil fields - Digboi, Ankaleshwar, Mumbai high,
3. Nuclear Power plants -Tarapur , Kakrapara, Rawat Bhata, Naraura, kalpakkam, Kaiga.
4. Solve PT - 2 question papers

SCIENCE:

Biology:

General instructions

1. Complete the written work neatly in your Science notebook.
2. Attempt all questions and write answers .
3. Draw neat, labelled diagrams wherever required.
4. Practise NCERT in-text questions, exercise questions and important diagrams from all five chapters.
5. Revise important definitions, biological processes, differences, scientific reasoning and applications.

Part A – Life Processes

Long Answer Questions (4–5 marks each)

1. Explain the process of nutrition in human beings with a labelled diagram of the alimentary canal.
2. Describe the mechanism of breathing and explain gaseous exchange in the lungs.
3. Explain the structure and functioning of the human heart with a labelled diagram.
4. Describe the structure of a nephron and explain the formation of urine.
5. Explain nutrition in plants, including the role of chlorophyll, sunlight, carbon dioxide and water.
6. Compare the transport systems in plants and human beings.

Part B – Control and Coordination

Long Answer Questions (4–5 marks each)

1. Draw a labelled diagram of a neuron and explain the transmission of nerve impulses.
2. Explain the human reflex arc with a labelled diagram.
3. Describe the major parts of the human brain and their functions.
4. Explain the functions of plant hormones: auxin, gibberellins, cytokinins and abscisic acid.

5. Describe the endocrine glands and hormones involved in growth, metabolism and blood glucose regulation.

Part C – How Do Organisms Reproduce?

Long Answer Questions (4–5 marks each)

1. Describe sexual reproduction in flowering plants with a labelled diagram of a flower.
2. Explain the structure and functions of the male reproductive system in human beings.
3. Explain the structure and functions of the female reproductive system in human beings.
4. Describe the major events from fertilisation to implantation in human reproduction.
5. Explain different methods of contraception and their importance.
6. Compare sexual and asexual reproduction, highlighting their processes, parental involvement and genetic variation.

Part D – Heredity

Section I: Very Short Answer Questions (1 mark each)

1. What is heredity?
2. What is variation?
3. Who is known as the father of genetics?
4. Define a gene.
5. What are chromosomes?
6. What is a dominant trait?
7. What is a recessive trait?
8. What is a genotype?
9. What is a phenotype?
10. What is the usual sex chromosome combination in human females?
11. What is the usual sex chromosome combination in human males?
12. What is the role of DNA in inheritance?

Section II: Long Answer Questions (4–5 marks each)

1. Explain Mendel's monohybrid cross using a suitable cross and show the F_1 and F_2 generations.
2. Describe how traits are inherited from parents to offspring.
3. Explain the difference between inherited and acquired characteristics with suitable examples.
4. Explain sex determination in human beings using a cross diagram.
5. Describe how variations arise during reproduction and why they matter for populations.

Part E – Our Environment

Section I: Long Answer Questions (4–5 marks each)

1. Explain the flow of energy in an ecosystem using a suitable food chain and the ten per cent law.
2. Describe the effects of non-biodegradable substances on the environment.
3. Explain biological magnification using a suitable food chain.
4. Explain the causes and effects of ozone layer depletion and suggest measures to protect the ozone layer.
5. Describe the importance of decomposers and the cycling of materials in an ecosystem.

Section II: Competency-Based Questions

Q1. Food chain and energy transfer

Consider the food chain:

Grass → Grasshopper → Frog → Snake

Assume that grass stores 10,000 J of energy.

- Calculate the energy transferred to the grasshopper.
- Calculate the energy transferred to the frog.
- Calculate the energy transferred to the snake.
- Explain why the energy available decreases at successive trophic levels.

Chemistry:

CLASS X | SCIENCE – CHEMISTRY | Chapters 1 to 4

Name:		Class & Section:	
Roll No.:		Date of Submission:	

General Instructions

- This homework covers the first four chapters of NCERT Science (Class X): Chapter 1 – Chemical Reactions and Equations, Chapter 2 – Acids, Bases and Salts, Chapter 3 – Metals and Non-metals, Chapter 4 – Carbon and its Compounds.
- Each chapter has 16 questions: 6 MCQs, 3 Assertion–Reason questions, 4 Short Answer questions and 3 Long Answer questions. Marks are shown in square brackets.
- Most questions are based on the NCERT textbook and its in-text and exercise questions. Revise the chapters before attempting.
- Write the answers in a separate Chemistry homework notebook / A4 sheets. For MCQs and Assertion–Reason questions, write the question number with the correct option and its content.
- Write chemical equations in balanced form with state symbols wherever required. Draw neat, labelled diagrams in pencil.
- Submit the completed homework on the day the school reopens after the autumn break.

Marking Scheme (per chapter)

Type of Question	No. of Questions	Marks Each	Total Marks
A. Multiple Choice (MCQ)	6	1	6
B. Assertion–Reason	3	1	3
C. Short Answer	4	2 / 3 / 4	10–12
D. Long Answer	3	5	15

Chapter 1: Chemical Reactions and Equations

Section A – Multiple Choice Questions (1 mark each)

- Which of the following is a combination reaction? [1]
(a) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ (b) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$
(c) $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$ (d) $2\text{AgCl} \rightarrow 2\text{Ag} + \text{Cl}_2$
- Rancidity of food containing fats and oils can be prevented by: [1]
(a) adding antioxidants to the food
(b) flushing the food packet with nitrogen
(c) storing food in air-tight containers
(d) all of the above
- When a magnesium ribbon is burnt in air, the ash (product) formed is of which colour? [1]
(a) Black (b) White
(c) Yellow (d) Pink
- In the electrolysis of water, the volume of gas collected at the cathode is double that collected at the anode. The gas at the cathode is: [1]
(a) Oxygen (b) Hydrogen
(c) Chlorine (d) Nitrogen
- The reaction $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$ is an example of a: [1]
(a) combination reaction (b) double displacement reaction
(c) decomposition reaction (d) displacement reaction
- On heating lead nitrate strongly, brown fumes are evolved. The brown fumes are of: [1]
(a) oxygen (b) nitrogen dioxide
(c) lead oxide (d) dinitrogen oxide

Section B – Assertion and Reason Questions (1 mark each)

Each question has an Assertion (A) and a Reason (R). Choose the correct option:

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.
- Assertion (A): Burning of magnesium ribbon in air is an oxidation reaction. [1]
Reason (R): In this reaction, magnesium gains oxygen to form magnesium oxide.
- Assertion (A): The reaction of barium chloride solution with sodium sulphate solution is a displacement reaction. [1]
Reason (R): A white precipitate of barium sulphate is formed in this reaction.
- Assertion (A): Photosynthesis is an endothermic process. [1]
Reason (R): Energy in the form of sunlight is released during photosynthesis.

Section C – Short Answer Questions

10. Why should a magnesium ribbon be cleaned before burning in air? [2]
11. Write a balanced chemical equation with state symbols for the following reaction: Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and a solution of sodium chloride. [2]
12. What is meant by rancidity? Mention two methods to prevent it. [3]
13. A solution of a substance 'X' is used for whitewashing. (i) Name the substance 'X' and write its formula. (ii) Write the reaction of the substance 'X' with water. State whether the reaction is exothermic or endothermic. [3]

Section D – Long Answer Questions (5 marks each)

14. What is a balanced chemical equation? Why should chemical equations be balanced? Write balanced chemical equations (with state symbols) for the following: [5]
 - (a) Hydrogen + Chlorine $\rightarrow$ Hydrogen chloride
 - (b) Barium chloride + Aluminium sulphate $\rightarrow$ Barium sulphate + Aluminium chloride
 - (c) Sodium + Water $\rightarrow$ Sodium hydroxide + Hydrogen
15. What is a decomposition reaction? Give one example each of thermal decomposition, electrolytic decomposition and photolytic decomposition (with balanced equations). Why are decomposition reactions called the opposite of combination reactions? [5]
16. (a) Distinguish between exothermic and endothermic reactions with two examples of each. (b) Why is respiration considered an exothermic reaction? (c) Why does the colour of copper sulphate solution change when an iron nail is dipped in it? Write the chemical equation and name the type of reaction. [5]

Chapter 2: Acids, Bases and Salts

Section A – Multiple Choice Questions (1 mark each)

1. The pH of the gastric juice released during digestion is approximately: [1]
 - (a) 1.2
 - (b) 7.0
 - (c) 8.4
 - (d) 5.6
2. The chemical formula of Plaster of Paris is: [1]
 - (a) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 - (b) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$
 - (c) CaSO_4
 - (d) $\text{CaSO}_4 \cdot 5\text{H}_2\text{O}$
3. Which of the following salts does not contain water of crystallisation? [1]
 - (a) Blue vitriol
 - (b) Baking soda
 - (c) Washing soda
 - (d) Gypsum
4. A solution turns red litmus paper blue. Its pH is likely to be: [1]
 - (a) 1
 - (b) 4
 - (c) 5
 - (d) 10

5. The gas evolved when dilute hydrochloric acid reacts with sodium hydrogencarbonate is: [1]
- (a) H_2 (b) CO_2
(c) O_2 (d) Cl_2
6. Bleaching powder is prepared by the action of chlorine gas on: [1]
- (a) dry slaked lime (b) quick lime
(c) limestone (d) gypsum

Section B – Assertion and Reason Questions (1 mark each)

Each question has an Assertion (A) and a Reason (R). Choose the correct option:

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.
7. Assertion (A): Dry HCl gas does not change the colour of dry blue litmus paper. [1]
Reason (R): HCl gas produces H^+ ions only in the presence of water.
8. Assertion (A): The pH of a neutral solution is 7. [1]
Reason (R): A solution having pH more than 7 is basic in nature.
9. Assertion (A): A solution of sodium hydroxide is acidic in nature. [1]
Reason (R): On dissolving in water, sodium hydroxide produces hydroxide ions.

Section C – Short Answer Questions

10. Why does an aqueous solution of an acid conduct electricity? [2]
11. Why do HCl, HNO₃, etc. show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character? [2]
12. Name the process by which sodium hydroxide is manufactured. Write the chemical equation involved and name the three products formed. Give one use of each product. [3]
13. Equal lengths of magnesium ribbon are taken in test tubes A and B. Hydrochloric acid is added to test tube A, while acetic acid is added to test tube B. The amount and concentration of both acids are the same. In which test tube will the fizzing occur more vigorously and why? [3]

Section D – Long Answer Questions (5 marks each)

14. (a) What is Plaster of Paris? Write the chemical equation for its preparation. (b) Why is it stored in a moisture-proof container? (c) Write the reaction that takes place when water is added to Plaster of Paris. (d) Give two uses of Plaster of Paris. [5]
15. (a) Write the chemical name and formula of baking soda. How is it prepared? (b) What happens when baking soda is heated during cooking? Write the equation. (c) Give two uses of baking soda. (d) How is washing soda obtained from sodium carbonate? Write the equation. [5]
16. Explain the importance of pH in everyday life with reference to: (a) pH in our digestive system, (b) pH change as the cause of tooth decay, (c) soil pH and plant growth, (d) self-defence by animals and plants through chemical warfare (e.g. bee sting, stinging nettle) and its treatment. [5]

Chapter 3: Metals and Non-metals

Section A – Multiple Choice Questions (1 mark each)

1. Which of the following metals can be cut with a knife? [1]
(a) Sodium (b) Iron
(c) Copper (d) Aluminium
2. Which of the following metals reacts with steam but not with cold or hot water? [1]
(a) Sodium (b) Calcium
(c) Iron (d) Copper
3. Brass is an alloy of: [1]
(a) copper and zinc (b) copper and tin
(c) lead and tin (d) iron and carbon
4. Aqua regia is a freshly prepared mixture of: [1]
(a) 3 parts conc. HCl and 1 part conc. HNO₃
(b) 1 part conc. HCl and 3 parts conc. HNO₃
(c) 3 parts conc. HNO₃ and 1 part conc. H₂SO₄
(d) 1 part conc. HCl and 1 part conc. HNO₃
5. Which of the following metals will not liberate hydrogen gas on reacting with dilute hydrochloric acid? [1]
(a) Mg (b) Fe

(c) Cu

(d) Zn

6. Which of the following is NOT a property of ionic compounds? [1]

(a) High melting and boiling points

(b) Solubility in water

(c) Conduction of electricity in the solid state

(d) Conduction of electricity in the molten state

Section B – Assertion and Reason Questions (1 mark each)

Each question has an Assertion (A) and a Reason (R). Choose the correct option:

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

7. Assertion (A): Sodium and potassium are stored under kerosene. [1]

Reason (R): They are highly reactive and catch fire if kept in the open.

8. Assertion (A): Ionic compounds have high melting points. [1]

Reason (R): Ionic compounds conduct electricity in the molten state.

9. Assertion (A): Sodium chloride conducts electricity in the solid state. [1]

Reason (R): In the solid state, the ions in sodium chloride are not free to move.

Section C – Short Answer Questions

10. Give reasons: (a) Platinum, gold and silver are used to make jewellery. (b) Sodium, potassium and lithium are stored under oil. (c) Carbonate and sulphide ores are usually converted into oxides during the process of extraction. [3]
11. What are amphoteric oxides? Give two examples of amphoteric oxides and write one equation to show their amphoteric nature. [2]
12. Write the electron-dot structures for sodium and chlorine. Show the formation of NaCl by the transfer of electrons. Name the ions present in this compound. [3]
13. Define the following terms: (i) Mineral (ii) Ore (iii) Gangue. Differentiate between roasting and calcination. [3]

Section D – Long Answer Questions (5 marks each)

14. Metals are extracted by different methods depending on their position in the reactivity series. Explain with one example each how metals of (i) high reactivity, (ii) medium reactivity and (iii) low reactivity are extracted. Write the chemical equations involved in obtaining zinc from zinc sulphide ore. [5]
15. Describe the electrolytic refining of copper. Name the anode, cathode and electrolyte used, and explain what happens to the impurities. Draw a neat labelled diagram. [5]
16. What is corrosion? Write the conditions necessary for the rusting of iron. Write any three methods of preventing corrosion. What is galvanisation? Why are alloys preferred over pure metals? Give one example of an alloy with its constituents. [5]

Chapter 4: Carbon and its Compounds

Section A – Multiple Choice Questions (1 mark each)

1. The number of covalent bonds in a molecule of ethane (C_2H_6) is: [1]
(a) 6 (b) 7
(c) 8 (d) 9
2. Ethanol, on heating with excess concentrated sulphuric acid at 443 K, gives: [1]
(a) ethene (b) ethane
(c) ethanoic acid (d) ethyl ethanoate
3. The functional group $-CHO$ is present in: [1]
(a) ketones (b) alcohols
(c) aldehydes (d) carboxylic acids
4. The cleansing action of soap is due to: [1]
(a) hydrolysis of soap (b) formation of micelles
(c) neutralisation of dirt (d) oxidation of dirt
5. Which of the following is NOT a saturated hydrocarbon? [1]
(a) CH_4 (b) C_2H_4
(c) C_3H_8 (d) C_4H_{10}

6. The next homologue of the compound C_3H_7OH is: [1]
- | | |
|----------------|-------------------|
| (a) C_4H_9OH | (b) C_4H_8OH |
| (c) C_3H_6OH | (d) $C_4H_{10}OH$ |

Section B – Assertion and Reason Questions (1 mark each)

Each question has an Assertion (A) and a Reason (R). Choose the correct option:

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.
7. Assertion (A): Carbon forms a very large number of compounds. [1]
Reason (R): Carbon shows tetravalency and the property of catenation.
8. Assertion (A): Pentane has three structural isomers. [1]
Reason (R): Isomers are compounds with the same molecular formula but different structures.
9. Assertion (A): Saturated hydrocarbons generally burn with a clean flame. [1]
Reason (R): Unsaturated hydrocarbons burn with a clean flame without producing soot.

Section C – Short Answer Questions

10. What are covalent compounds? Why do they have low melting and boiling points? Why do they generally not conduct electricity? [3]
11. Draw the structures of the following compounds: (a) ethanoic acid (b) bromopentane (are structural isomers possible?) (c) butanone (d) hexanal. [4]
12. What is hydrogenation? What is its industrial application? [2]
13. Explain the formation of scum when hard water is treated with soap. Are detergents effective in hard water? Give a reason. [3]

Section D – Long Answer Questions (5 marks each)

14. What are soaps? Explain the cleansing action of soap with the help of micelle formation. Draw a labelled diagram of a micelle. Why do soaps not form lather with hard water? [5]
15. What is a homologous series? Explain with the example of alkanes (general formula, first four members, molecular formulae). State two characteristics of a homologous series, and explain the gradation in physical properties and the similarity in chemical properties. [5]
16. Write the chemical equations for the following reactions: (a) ethanol + sodium, (b) ethanol heated with conc. H_2SO_4 at 443 K, (c) ethanoic acid + sodium hydroxide, (d) ethanoic acid + ethanol in the presence of conc. H_2SO_4 (name the reaction and the product), (e) saponification of ethyl ethanoate with NaOH. Also state one way to distinguish experimentally between ethanol and ethanoic acid. [5]

PHYSICS:

1. Electric Current and Potential Difference

Define electric current and potential difference. Write their SI units and the mathematical expressions used to calculate them.

2. Ohm's Law

State Ohm's law. Draw a circuit diagram to verify Ohm's law experimentally and sketch the V–I graph for an ohmic conductor.

3. Resistance of a Conductor

State the factors on which the resistance of a conductor depends. Write the mathematical relation between resistance, length, area of cross-section and resistivity.

4. Series Combination of Resistors

Derive the expression for the equivalent resistance of three resistors connected in series. Calculate the equivalent resistance when 2 Ω , 3 Ω and 5 Ω resistors are connected in series.

5. Parallel Combination of Resistors

Derive the expression for the equivalent resistance of three resistors connected in parallel. Calculate the equivalent resistance of 6 Ω and 3 Ω resistors connected in parallel.

6. Heating Effect of Electric Current

State Joule's law of heating. Derive the expression $(H=I^2Rt)$. Mention two practical applications of the heating effect of electric current.

7. Electric Power

Define electric power and derive the expressions $(P=VI)$, $(P=I^2R)$ and $(P=\frac{V^2}{R})$. State the SI unit of electric power.

8. Numerical Problem on Ohm's Law

A resistor of resistance 12 Ω is connected to a 6 V battery.

- (a) Calculate the current flowing through the resistor.
- (b) Calculate the charge flowing through it in 5 minutes.

9. Numerical Problem on Electrical Energy

An electric heater rated 1,000 W operates for 2 hours daily.

- (a) Calculate the electrical energy consumed in one day in kWh.
- (b) Calculate the energy consumed in 30 days.
- (c) Find the cost of electricity at ₹6 per unit.

10. Household Electricity and Safety

Explain why household appliances are connected in parallel. What are the functions of an electric fuse and an earth wire? Why should electrical appliances not be handled with wet hands?

SOCIAL:

1. Write note on any three points given below (about 120 words each)

- Bright future of Solar Energy in India
- Industrial Pollution and steps to be taken to minimize it
- Role of banks in Indian Economy
- Mahatma Gandhi and Non co-operation movement.

2. Map pointing

Label the following on outline map of India

- Coal mines – Raniganj , Bokaro, Korba, Singrauli, Singareni, Neyveli , Jharia
- Oil fields - Digboi, Ankaleshwar, Mumbai high,
- Nuclear Power plants -Tarapur , Kakrapara, Rawat Bhata, Naraura, kalpakkam, Kaiga.
- Solve PT - 2 question papers

SANSKRIT:

१) मञ्जूषायाः सहाय्येन पत्रद्वयं (2 Letters) लिखित्वा रिक्तस्थानानां पूर्तिं कुरुत।

* २) संवादरूपेण प्रश्नद्वयं (2 Dialogues) लिखित्वा मञ्जूषातः रिक्तस्थानानां पूर्तिं कुरुत।

* ३) द्वे चित्रे निर्माय मञ्जूषापदैः पञ्च संस्कृतावाक्यानि लिखत।

* ४) एकम् अपठितं गद्यं लिखित्वा एकपदेन, पूर्णवाक्येन, भाषिककार्येण च युक्तानां प्रश्नानाम् उत्तराणि लिखत।

ARTIFICIAL INTELLIGENCE :

Unit 1: Revisiting AI Project Cycle & Ethical Frameworks for AI

Short Answer Questions (2 Marks)

- What is bioethics? List any two principles of bioethics. [2026-27]
- What do you do in the second and third stages of an AI Project cycle? [2025-26]
- All of us use smartphones. When we install a new app, it asks us for several permissions to access our phone's data in different ways. Why do apps collect such data? [2023-24 / 2024-25]

4. Ajay wants to access data from various sources. Suggest him any two points that he needs to keep in mind while accessing data from any data source. [2023-24 / 2024-25]

Long Answer / Case Study Questions (4 Marks)

1. Your grandmother watches you use AI applications. She wants to understand more about it. Help her understand the term artificial intelligence by giving the right definition and explain to her with an example how machines become artificially intelligent. [2023-24 / 2024-25]
2. Akhil wants to learn how to scope the problem for an AI Project. Explain him the following: [2023-24 / 2024-25]
 - (a) 4W Problem Canvas
 - (b) Problem Statement Template
3. Read the case study below and answer the following questions:
A school installs AI-powered cameras to monitor student behavior and reduce bullying. The AI can recognize facial expressions and body language, then alert teachers if it detects aggression or stress. Some parents and students support it for safety purposes. Others are concerned about constant surveillance and personal privacy. [2026-27]
 - a) What ethical concerns should be discussed before installing the AI-powered cameras?
 - b) How can the system avoid violating user privacy? Should the AI be allowed to make decisions without human oversight?
4. Read the case study below and answer the following questions:
A school develops an AI system to shortlist students for a competitive scholarship. The algorithm is trained to prioritize students who complete online application forms quickly — assuming that faster completion reflects confidence, competence, and tech-savviness. However, students who are not fluent in English, or who do not have access to a computer at home, take longer to fill out the form. As a result, many deserving students are unfairly rejected by the algorithm. [2025-26]
 - a) Identify two reasons why the algorithm gave biased results.
 - b) Mention two bioethics principles that can help solve such a problem and explain how they apply.

Unit 2: Advanced Concepts of Modeling in AI

Short Answer Questions (2 Marks)

1. What is an association rule in machine learning? Explain how association rules help in finding relationships between products using an example. [2026-27]
2. What is anomaly detection in machine learning? Support your answer with a relevant example. [2026-27]

3. Identify the type of deep learning model. [2025-26]
 - a) This deep learning model processes input images by learning to assign importance (weights and biases) to various features in the image, allowing it to distinguish one object from another.
 - b) This deep learning model is inspired by the structure of the human brain. It can automatically extract features from large datasets without explicit programming. Each node in the network acts like a small machine learning algorithm.
4. How is reinforcement learning different from supervised and unsupervised learning? [2025-26]
5. Sirisha and Divisha want to make a model which will organize the unlabeled input data into groups based on features. Which learning model should they use and why? [2023-24 / 2024-25]

Long Answer / Case Study Questions (4 Marks)

1. You are designing a smart assistant that can recognize objects in pictures – like identifying a dog or a tree. You decide to use a neural network for this task. Explain what a neural network is and how it would process the image using the input layer, hidden layers, and output layer. What role does each layer play in helping the assistant learn and give the correct answer? [2026-27]
2. [2025-26]
 - a) What is the name of the learning model that works with unlabeled data to identify hidden patterns or structures in the data?
 - b) Name the two main categories of this learning model.
 - c) Explain each category briefly and provide one example for each.
3. Identify the name of the application of Machine Learning (ML) or Deep Learning (DL) being used in the following scenarios. [2025-26]
 - a) A fitness tracker uses AI to monitor your heart rate and learn what is normal for you. One evening, while you're relaxing and watching a horror movie, the tracker suddenly flags a spike in your heart rate as an anomaly — thinking something might be wrong.
 - b) A wildlife camera is equipped with AI to monitor animals in a forest. It not only records movement of animals, but also identifies and classifies them into categories like “bird”, “mammal”, “insect”, etc.
 - c) A smart refrigerator is equipped with an internal camera and an AI system. One of its door features a display screen that shows a real-time image of the inside, capturing all the food items on various shelves. For each item, the system not only shows its actual image but also places an AI-generated label on top of it, such as: “Milk Carton”, “Apple”, “Ice Cream”.
 - d) Imagine an app that helps you unlock your bike. Instead of typing a password, you simply scribble a numerical code like “5281” on your phone screen using your finger — even if your handwriting is a bit messy after a tough workout.

4. Identify and explain the types of the learning-based approaches in the figures given below (Figure 1 and Figure 2). [Figure-based question – refer to the original paper] [2023-24 / 2024-25]

Unit 3: Evaluating Models

Short Answer Questions (2 Marks)

1. What is the need for model evaluation? Why is it important to evaluate a model on unseen data? [2026-27]
2. What is model evaluation in machine learning, and how does it help improve an AI model? [2025-26]

Confusion Matrix Based Questions – Short Answer (2 Marks)

1. Draw the confusion matrix for the following data: [2023-24 / 2024-25]
 - the number of true positive = 100
 - the number of true negative = 47
 - the number of false positive = 62
 - the number of false negative = 290

Confusion Matrix Based Questions – Long Answer (4 Marks)

1. A sentiment analyzer is used to classify responses as positive (1) or negative (0). Out of 500 responses: [2026-27]
 - True Positives (TP): 150 responses were correctly classified as positive.
 - False Positives (FP): 100 responses were incorrectly classified as positive.
 - True Negatives (TN): 200 responses were correctly classified as negative.
 - False Negatives (FN): 50 responses were incorrectly classified as negative.Calculate accuracy, precision, recall and F1-score.

2. An AI model made the following sales prediction for a new mobile phone which they have recently launched: [2023-24 / 2024-25]

Confusion Matrix	Reality: Yes	Reality: No
Prediction: Yes	50	40
Prediction: No	12	10

- (i) Identify the total number of wrong predictions made by the model.
- (ii) Calculate precision, recall and F1 Score.

3. Read the following paragraph and answer the questions that follow:
A school recently tested an AI model designed to predict whether students would pass or fail their final exams. Out of 100 students, the model correctly predicted that 40 students would pass and they actually did. It also correctly identified 30 students who were going to fail. However, the model predicted that 20 students would pass, but they ended up failing. Additionally, it predicted that 10 students would fail, but they actually passed. [2025-26]
- a) Draw the confusion matrix based on the above information. (2)
 - b) Calculate the accuracy of this classification model. Show your working. (1)
 - c) Write the total number of wrong predictions made by the model. (1)

Confusion Matrix Based Questions – Objective Type (1 Mark)

1. A high F1 score generally suggests: [2026-27]
 - a) A significant imbalance between precision and recall
 - b) A good balance between precision and recall
 - c) A model that only performs well on specific data points
 - d) The need for more training data
2. An AI model is deployed to issue flood warnings for surrounding villages, enabling residents and authorities to take preventive measures. One day, the model alerts of a possible flood, but it turns out to be a false alarm. What does this scenario represent? [2026-27]
 - a) True Positive
 - b) True Negative
 - c) False Positive
 - d) False Negative
3. Precision is one of the evaluation metrics. [2026-27]
 - a) Defined as the fraction of positive cases that are correctly identified, taking into account the true reality cases.
 - b) Ratio of total number of correctly classified positive examples and the total number of predicted positive examples.
 - c) Defined as the percentage of correct predictions out of all the observations.
 - d) Comparison between the prediction and reality
4. A new medical test is being evaluated for its ability to detect a particular disease. Out of 200 tests conducted: 80 tests correctly identified the presence of the disease; 30 tests incorrectly identified the disease when it wasn't present; 40 tests failed to detect the disease even though it was present. What is the precision of the test? [2026-27]
 - a) 0.73

- b) 0.50
- c) 0.64
- d) 0.57

5. In a spam email detection system, out of 1000 emails received, 300 are spam. The system correctly identifies 240 spam emails as spam, but it also marks 60 legitimate emails as spam. What is the precision of the system? [2025-26]
- a) 0.80
 - b) 0.70
 - c) 0.75
 - d) 0.90
6. _____ is the outcome of the model wrongly predicting the negative class as positive class. [2025-26]
7. F1 Score is the measure of the balance between [2023-24 / 2024-25]
- (a) Accuracy and Precision
 - (b) Precision and Recall
 - (c) Recall and Accuracy
 - (d) Recall and Reality
8. Statement 1: The output given by the AI model is known as reality. Statement 2: The real scenario is known as Prediction. [2023-24 / 2024-25]
- (a) Both Statement 1 and Statement 2 are correct
 - (b) Both Statement 1 and Statement 2 are incorrect
 - (c) Statement 1 is correct but Statement 2 is incorrect
 - (d) Statement 2 is correct but Statement 1 is incorrect
9. Which evaluation parameter takes into consideration all the correct predictions? [2023-24 / 2024-25]
10. Which one of the following scenario result in a high false positive cost? [2023-24 / 2024-25]
- (a) viral outbreak
 - (b) forest fire
 - (c) flood

(d) spam filter

Unit 5: Computer Vision

Short Answer Questions (2 Marks)

1. Differentiate between Object detection and Instance Segmentation. [2026-27]
2. What is a “byte image” format in the context of digital images? [2025-26]
3. Explain the term resolution with an example. [2023-24 / 2024-25]

Unit 6: Natural Language Processing

Short Answer Questions (2 Marks)

1. A newspaper company uses an AI model that can automatically sort articles into categories like Sports, Politics, Health, and Technology. Identify this NLP application and explain how it helps. [2026-27]
2. Identify the stage of NLP and explain.
We are to the zoo going tomorrow.
We are going to the zoo tomorrow. [2025-26]
3. Identify any two stop words which should not be removed from the given sentence and why?
Get help and support whether you're shopping now or need help with a past purchase. Contact us at abc@pwershel.com or on our website www.pwershel.com [2023-24 / 2024-25]

Long Answer / Case Study Questions (4 Marks)

1. Imagine you're building a help chatbot for a school website to answer routine queries like “What are the school timings?” or “When will exams be held?” [2026-27]
 - a) Would you use a rule-based or learning-based approach?
 - b) Explain the approach you have chosen.
 - c) What are the limitations of your chosen approach in this situation?
 - d) Suggest one way to improve the chatbot if students start asking new types of questions that are not covered in the original rules.
2. Answer the questions given below-
Document 1: “The cat sat on the mat”
Document 2: “The dog is barking”
Document 3: “Both are good pets” [2026-27]
 - a) Find out the frequency of a word in one document.
 - b) Construct the document frequency table.
 - c) Draw Inverse Document frequency table.

d) What is the formula of TFIDF for any word W.

3. Read the following three documents and answer the questions that follow:

Document 1: "Students love studying AI"

Document 2: "AI is transforming education"

Document 3: "Teachers and students explore AI tools"

After performing basic text pre-processing (removing punctuation, converting to lowercase, and tokenizing), the documents become:

Document 1: [students, love, studying, ai]

Document 2: [ai, is, transforming, education]

Document 3: [teachers, and, students, explore, ai, tools] [2025-26]

a) Create the dictionary (vocabulary) of unique words from all three documents.

b) Construct the document vector for Document 3 using the dictionary.

c) Explain how Bag of Words help in feature extraction.

d) Why is the order of words not considered important in Bag of Words?

4. We, human beings, can read, write and understand many languages. But computers can understand only machine language. Do you think we might face any challenges if we try to teach computers how to understand and interact in human languages? Explain. [2023-24 / 2024-25]

Part A: Employability Skills (2 Marks Each)

Unit 1: Communication Skills – II

1. List two best practices for effective communication. [2023-24 / 2024-25]

2. List the different types of verbal communication. [2026-27]

3. What is a pronoun? Give an example. [2025-26]

Unit 2: Self-Management Skills – II

1. What is the importance of setting goals in life? [2023-24 / 2024-25]

2. What is SMART in goal setting? [2026-27]

3. List four steps to build self-motivation. [2025-26]

Unit 3: ICT Skills – II

1. "The Trojan Horse was a wooden horse said to have been used by the Greeks during the Trojan War to enter the city of Troy and win the war". What does Trojan horse mean in computer terminology? [2023-24 / 2024-25]

2. Explain how the Trojan Horse virus works. [2026-27]

3. "Security break is leakage of information stored in a computer". Explain two ways in which personal information can be lost or leaked. [2025-26]

Unit 4: Entrepreneurial Skills – II

1. How is society helping entrepreneurs in their business? [2023-24 / 2024-25]
2. What are the qualities of an entrepreneur? [2026-27]
3. Reema runs a small handmade soap business. Every morning, she decides what products to make, how many soaps to produce, and where to sell them. She also arranges raw materials and assigns tasks to her staff. From the paragraph, identify and write the two functions of an entrepreneur that are being described. [2025-26]

Unit 5: Green Skills – II

1. Mention any two human activities that lead to environmental degradation. [2023-24 / 2024-25]
2. Explain the importance of education towards sustainable development. [2026-27]
3. What is organic farming? Mention any two benefits of practising organic farming. [2025-26]

CLASS-11

HINDI:

नोट-

1 कार्य को अपनी आभ्यास पुस्तिका (notebook) में कीजिए।

2 कार्य को सुंदर और साफ़ लेखें।

प्रश्न 1-पटकथा लेखन

निम्नलिखित विषय पर लगभग दृश्य) शब्दों में एक छोटी पटकथा 200-150, पात्रों के संवाद और अभिनय संकेत के साथ लिखिए।

कानदार के बीच किसी वस्तु की खएक दुकान पर ग्राहक और दु रीदफ्रिक को लेकर हुई हास्यप्रद बातचीत-

प्रश्न 2-डायरी लेखन

शरदकालीन अवकाश के दौरान आपके जीवन में घटी किसी अत्यंत रोमांचक, सुखद या प्रेरणादायक घटना का वर्णन करते हुए एक डायरी प्रविष्टि। (क और समय का उल्लेख अवश्य करें दिनां) लिखिए। (शब्दों में 120-100 लगभग)

प्रश्न 3- स्ववृत्त लेखन

प्रश्न: 'स्ववृत्त' लेखन से क्या आशय है? एक आदर्श स्ववृत्त में कौनकौन सी मुख्य बातें या शीर्षक होने चाहिए-? इसे स्पष्ट कीजिए।

प्रश्न 4- भारतीय गायिकाओं में बेजोड़ लता मंगेशकर : ' के आधार पर लता जी की गायकी की विशेषता शब्दों 150 में अपने शब्दों में लिखिए।

प्रश्न 5- राजस्थान में कुई का निर्माण क्यों और कैसे किया जाता है? 'राजस्थान की रजत बूँदें' (अनुपम मिश्रपाठ के) आधार पर स्पष्ट कीजिए शब्द सीमा (150)।

ENGLISH:

4. 1 Two.unseen reading comprehension
5. 2. Two note making passages
6. 3. Two speeches
7. A.speech on importance of saving environment.
8. B speech on road safety.
9. 4 write two classifieds
10. Situation wanted
11. House / flat for sale
12. 5 Debate both for the motion and against the motion.
13. Home works should be banned in all schools.
14. Or
15. should India be a demoractic country?

MATHS:

1. Let A and B be sets. If $A \cap X = B \cap X = \phi$ and $A \cup X = B \cup X$ for some set X, show that $A = B$.
2. Show that $A \cup B = A \cap B$ implies $A = B$.
3. Find the domain and range of the real function $f(x) = \sqrt{9 - x^2}$.
4. Let $f = \{(x, \frac{x^2}{1+x^2}) : x \in \mathbb{R}\}$ be a function from $\mathbb{R}$ into $\mathbb{R}$. Determine the range of f.
5. Let R be a relation from $\mathbb{Q}$ to $\mathbb{Q}$ defined by $R = \{(a, b) : a, b \in \mathbb{Q} \text{ and } a - b \in \mathbb{Z}\}$.

Show that: (i) $(a, a) \in R$ for all $a \in \mathbb{Q}$ (ii) $(a, b) \in R$ implies that $(b, a) \in R$

(iii) $(a, b) \in R$ and $(b, c) \in R$ implies that $(a, c) \in R$

6. Prove that $\tan 4x = \frac{4 \tan x (1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x}$
7. Prove that $\cos 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1$.
8. If $\tan x = \frac{3}{4}$, $\pi < x < \frac{3\pi}{2}$, find the values of $\sin \frac{x}{2}$, $\cos \frac{x}{2}$, $\tan \frac{x}{2}$?
9. Prove that $\cos^2 x + \cos^2(x + \frac{\pi}{3}) + \cos^2(x - \frac{\pi}{3}) = \frac{3}{2}$
10. Prove that $\cos 2x \cos \frac{x}{2} - \cos 3x \cos \frac{9x}{2} = \sin 5x \sin \frac{5x}{2}$
11. Prove that $(\cos x - \cos y)^2 + (\sin x - \sin y)^2 = 4 \sin^2(\frac{x-y}{2})$.

12. If $(x + iy)^3 = u + iv$, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$
13. Solve $6 \leq -3(2x - 4) < 12$.
14. A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that the acid content in the resulting mixture will be more than 15% but less than 18%?
15. Find r , if: (i) ${}_4P_r = 6 \cdot {}_5P_{r-1}$. (ii) $n_{P_r} = 840$ and $n_{C_r} = 35$.
16. How many numbers greater than a million can be formed by using the digits 1,2,0,2,4,2,4?
17. Using the letters of the word DAUGHTER, answer the following questions:
- How many words can be formed with or without meaning,
- (i) each of 2 vowels and 3 consonants?
- (ii) there are always 4 letters between D and R, assuming that no letter is repeated?
- (iii) all the consonants occur together?
- (iv) no two vowels come together?
- (v) vowels occupy even places only?
18. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consists of:
- (i) exactly 3 girls? (ii) no girl? (iii) at least 3 girls?
- (iv) at most 3 girls? (v) at least one boy and one girl?
19. Find the number of words with or without meaning which can be made using all the letters of the word AGAIN. If these words are written as in a dictionary, what will be the 50th and 60th words?
20. Find $(x + 1)^6 + (x - 1)^6$. Hence, evaluate $(\sqrt{2} + 1)^6 + (\sqrt{2} - 1)^6$.
21. Find the sum to n terms of the sequence 8, 88, 888, 8888, ...
22. The sum of two numbers is 6 times their geometric mean, show that numbers are in the ratio $(3 + 2\sqrt{2}) : (3 - 2\sqrt{2})$
23. The sum of first three terms of a G.P. is $\frac{13}{12}$ and their product is -1 . Find the common ratio and the terms.
24. Find the value of n so that $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ may be the geometric mean between a and b .
25. Let $x = 1 + a + a^2 + \dots$ and $y = 1 + b + b^2 + \dots$, where $|a| < 1$ and $|b| < 1$.
Prove that $1 + ab + a^2b^2 + \dots = \frac{xy}{x+y-1}$.

COMPUTER SCIENCE:

Day 1 | Simple if and if-else

Q1. Write a program to accept an integer and display whether it is even or odd.

SAMPLE RUN

Enter a number: 7

7 is Odd

Q2. Write a program to accept the age of a person and check whether the person is eligible to vote (age 18 or above). If not eligible, display how many more years the person must wait.

SAMPLE RUN

Enter your age: 16

Not eligible. Wait for 2 more year(s)

Q3. Write a program to accept two numbers and display the larger of the two.

SAMPLE RUN

Enter first number: 25

Enter second number: 40

Larger number: 40

Q4. Write a program to accept a year and check whether it is a leap year. (A year is a leap year if it is divisible by 4 but not by 100, or it is divisible by 400.)

SAMPLE RUN

Enter a year: 2024

2024 is a Leap Year

Q5. Write a program to accept marks out of 100 and display Pass if the marks are 33 or more, otherwise display Fail.

SAMPLE RUN

Enter marks out of 100: 28

Result: Fail

Day 2 | if-elif-else Ladder

Q1. Write a program to accept a number and display whether it is positive, negative or zero.

SAMPLE RUN

Enter a number: -8

Negative

Q2. Accept marks out of 100 and display the grade: A (90 and above), B (75 to 89), C (60 to 74), D (33 to 59) and E - Fail (below 33).

SAMPLE RUN

Enter marks (0-100): 82

Grade: B

Q3. Write a program to accept three numbers and display the largest among them.

SAMPLE RUN

Enter first number: 12

Enter second number: 45

Enter third number: 30

Largest = 45

Q4. Accept the three sides of a triangle. First check whether a triangle can be formed (sum of any two sides must be greater than the third). If valid, display whether it is Equilateral, Isosceles or Scalene.

SAMPLE RUN

Enter side 1: 5

Enter side 2: 5

Enter side 3: 8

Isosceles triangle

Q5. Write a program to calculate an electricity bill: first 100 units at Rs. 5 per unit, next 100 units at Rs. 7 per unit and units above 200 at Rs. 10 per unit.

SAMPLE RUN

Enter units consumed: 250

Total bill: Rs. 1700

Day 3 | Nested if and Applications

Q1. Using nested if statements, accept a number and display whether it is divisible by both 3 and 5, by 3 only, by 5 only, or by neither.

SAMPLE RUN

Enter a number: 45

Divisible by both 3 and 5

Q2. Accept two numbers and an operator (+, -, *, /). Perform the operation and display the result. Display a suitable message for division by zero and for an invalid operator.

SAMPLE RUN

Enter first number: 12

Enter operator (+, -, *, /): *

Enter second number: 5

Result: 60.0

Q3. Accept the coefficients a, b and c of a quadratic equation $ax^2 + bx + c = 0$. Display whether the roots are real and distinct, real and equal, or not real. Display the roots wherever they are real.

SAMPLE RUN

Enter a: 1

Enter b: -5

Enter c: 6

Two distinct real roots: 3.0 2.0

Q4. Accept a single character and display whether it is a vowel, a consonant, a digit or a special character.

SAMPLE RUN

Enter a single character: @

Special character

Q5. Accept the bill amount of a customer and give a discount: 20% on Rs. 5000 or more, 10% on Rs. 3000 or more, 5% on Rs. 1000 or more, otherwise no discount. Display the discount rate, discount amount and the amount payable.

SAMPLE RUN

Enter bill amount: 4000

Discount: 10%

Discount amount: 400.0

Amount payable: 3600.0

Day 4 | for Loop and range()

Q1. Write a program to accept a number n, display the first n natural numbers and find their sum.

SAMPLE RUN

Enter n: 5

1 2 3 4 5

Sum = 15

Q2. Write a program to accept a number and display its multiplication table up to 10.

SAMPLE RUN

Enter a number: 5

5 x 1 = 5

5 x 2 = 10

5 x 3 = 15

5 x 4 = 20

5 x 5 = 25

5 x 6 = 30

5 x 7 = 35

5 x 8 = 40

5 x 9 = 45

5 x 10 = 50

Q3. Write a program to find the sum of all even numbers and the sum of all odd numbers from 1 to n separately.

SAMPLE RUN

Enter n: 10

Sum of even numbers: 30

Sum of odd numbers: 25

Q4. Write a program to accept a number and display its factorial. Display a suitable message if the number is negative.

SAMPLE RUN

Enter a number: 5

Factorial of 5 is 120

Q5. Write a program to display all numbers between 1 and 100 that are divisible by 7, and also display how many such numbers there are.

SAMPLE RUN

7 14 21 28 35 42 49 56 63 70 77 84 91 98

Total: 14

Day 5 | while Loop and Digit Programs

Q1. Write a program to accept a number and find the sum of its digits.

SAMPLE RUN

Enter a number: 4725

Sum of digits = 18

Q2. Write a program to accept a number and display its reverse.

SAMPLE RUN

Enter a number: 1234

Reversed number = 4321

Q3. Write a program to check whether a number is a palindrome (reads the same forwards and backwards).

SAMPLE RUN

Enter a number: 121

121 is a palindrome

Q4. Write a program to count the number of digits in a given number using a while loop.

SAMPLE RUN

Enter a number: 90458

Number of digits = 5

Q5. Write a program to check whether a number is an Armstrong number (the sum of each digit raised to the power of the number of digits equals the number). Example: $153 = 1^3 + 5^3 + 3^3$.

SAMPLE RUN

Enter a number: 153

153 is an Armstrong number

Day 6 | Number Series and break / continue

Q1. Write a program to accept a number and check whether it is prime.

SAMPLE RUN

```
Enter a number: 29  
29 is a prime number
```

Q2. Write a program to display all prime numbers between two given limits.

SAMPLE RUN

```
Enter lower limit: 10  
Enter upper limit: 30  
Prime numbers: 11 13 17 19 23 29
```

Q3. Write a program to display the first n terms of the Fibonacci series (0, 1, 1, 2, 3, 5, ...).

SAMPLE RUN

```
How many terms? 8  
0 1 1 2 3 5 8 13
```

Q4. Write a program to accept two numbers and find their HCF (GCD) and LCM.

SAMPLE RUN

```
Enter first number: 12  
Enter second number: 18  
HCF = 6  
LCM = 36
```

Q5. Write a program to repeatedly accept numbers from the user until 0 is entered (use break). Ignore negative numbers (use continue) and display the sum of the positive numbers entered.

SAMPLE RUN

```
Enter a number (0 to stop): 10  
Enter a number (0 to stop): -5  
Negative number ignored  
Enter a number (0 to stop): 20  
Enter a number (0 to stop): 0  
Sum of positive numbers = 30
```

Day 7 | Nested Loops and Patterns

Q1. Write a program to accept the number of rows and print a right-angled triangle of stars.

SAMPLE RUN

Enter number of rows: 4

```
*  
  
**  
  
***  
  
****
```

Q2. Write a program to accept the number of rows and print an inverted triangle of numbers (see the sample run).

SAMPLE RUN

Enter number of rows: 4

```
1 2 3 4  
1 2 3  
1 2  
1
```

Q3. Write a program to accept the number of rows and print a pyramid of stars.

SAMPLE RUN

Enter number of rows: 4

```
  *  
 * *  
* * *  
* * * *
```

Q4. Write a program to accept the number of rows and print the number triangle shown in the sample run.

SAMPLE RUN

Enter number of rows: 4

```
1  
12  
123  
1234
```

Q5. Write a program to accept the number of rows and print Floyd's triangle, which fills consecutive natural numbers row by row.

SAMPLE RUN

Enter number of rows: 4

1

2 3

4 5 6

7 8 9 10

Day 8 | String Basics: Indexing, Slicing, Traversal

Q1. Write a program to accept a string and display its length, first character, last character and the reversed string (using slicing).

SAMPLE RUN

Enter a string: Python

Length: 6

First character: P

Last character: n

Reversed: nohtyP

Q2. Write a program to accept a string and count the number of vowels, consonants, digits and spaces in it.

SAMPLE RUN

Enter a string: Hello World 2026

Vowels: 3

Consonants: 7

Digits: 4

Spaces: 2

Q3. Write a program to check whether a string is a palindrome. Ignore the case of the letters.

SAMPLE RUN

Enter a string: Madam

Madam is a palindrome

Q4. Write a program to count the uppercase and lowercase letters in a string and display the characters present at even index positions (0, 2, 4, ...).

SAMPLE RUN

Enter a string: Python Programming

Uppercase letters: 2

Lowercase letters: 15

Characters at even positions: Pto rgamn

Q5. Write a program to change every uppercase letter of a string to lowercase and every lowercase letter to uppercase, without using swapcase().

SAMPLE RUN

Enter a string: Hello World

Toggled string: hELLO wORLD

Day 9 | String Methods and Operations

Q1. Write a program to accept a sentence, count the number of words in it and display the longest word.

SAMPLE RUN

Enter a sentence: Python is a powerful language

Number of words: 5

Longest word: powerful

Q2. Write a program to accept a string and a character, and count how many times the character occurs in the string (once using a loop and once using the count() method).

SAMPLE RUN

Enter a string: programming

Enter the character to count: g

Using loop: 2

Using count(): 2

Q3. Write a program to accept a string and display a new string after removing all the vowels.

SAMPLE RUN

Enter a string: Computer Science

String without vowels: Cmptr Scnc

Q4. Write a program to accept a sentence and convert the first letter of every word to uppercase and the remaining letters to lowercase, without using title().

SAMPLE RUN

Enter a sentence: welcome to python programming

Welcome To Python Programming

Q5. Write a program to check whether two strings are anagrams (they contain the same letters in a different order). Ignore case and spaces.

SAMPLE RUN

Enter first string: Listen

Enter second string: Silent

The strings are anagrams

Day 10 | Combined Programs: Strings with Loops and Conditions

Q1. Write a program to encrypt a message using the Caesar cipher: shift every letter forward by 3 positions (A becomes D, Z becomes C). Keep the case of the letters and leave other characters unchanged.

SAMPLE RUN

Enter text: Hello, World!

Encrypted text: Kloor, Zruog!

Q2. Write a program to accept a sentence and display all the words that begin with a vowel.

SAMPLE RUN

Enter a sentence: Python is an easy and interesting language

is

an

easy

and

interesting

Q3. Write a program to accept a sentence and reverse every word individually while keeping the word order the same.

SAMPLE RUN

Enter a sentence: Learn Python Daily

yliaD ytnoP nraeL

Q4. Write a program to check the strength of a password. A password is Strong if it has at least 8 characters and contains an uppercase letter, a lowercase letter, a digit and a special character; otherwise it is Weak.

SAMPLE RUN

Enter a password: Kalinga@2026

Strong password

Q5. Write a program to accept a word and print the pattern shown in the sample run, building up the word one letter at a time and then shrinking it back.

SAMPLE RUN

Enter a word: CODE

C

CO

COD

CODE

COD

CO

C

[Chemistry:](#)**Chemistry (Theory)**

Syllabus: Chapters 1–5 (NCERT Chemistry Part I)

Name: _____ Section: _____ Roll No.: _____**General Instructions**

1. Attempt all questions in a separate, neat Chemistry homework notebook (or A4 sheets pinned together). Write the question number before each answer.
 2. Short Answer (SA) questions carry 2 marks each; Long Answer (LA) questions carry 3 or 5 marks, as indicated.
 3. Show every step in numerical problems, with proper units and correct significant figures.
 4. Draw neat, labelled diagrams / structures wherever required.
 5. Most questions are from the NCERT textbook. Revise the NCERT text and solved examples of each chapter before attempting.
 6. Submit the homework on the day school reopens. Neatness and presentation carry marks.
-

Chapter 1: Some Basic Concepts of Chemistry**Section A: Short Answer Questions (2 marks each)**

1. State the law of multiple proportions. Illustrate it with the example of the oxides of carbon (CO and CO₂).
2. Distinguish between molarity and molality. Which of the two does not change with temperature, and why?
3. How many significant figures are present in each of the following? (i) 0.0025 (ii) 208 (iii) 5005 (iv) 126,000 (v) 500.0 (vi) 2.0034
4. Define limiting reagent. Explain with a suitable example.

- Calculate the number of atoms in: (i) 52 moles of Ar (ii) 52 u of He (iii) 52 g of He.
- Differentiate between empirical formula and molecular formula. Give one example.
- Calculate the molar mass of glucose ($C_6H_{12}O_6$) and find the number of molecules present in 18 g of it. ($N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$)
- Define mole fraction. Calculate the mole fraction of ethanol in a solution containing 46 g of ethanol and 54 g of water.

Section B: Long Answer Questions

- [3 marks]** A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molar mass is 98.96 g. What are its empirical and molecular formulae?
- [3 marks]** Calculate the amount of carbon dioxide that could be produced when: (i) 1 mole of carbon is burnt in air; (ii) 1 mole of carbon is burnt in 16 g of dioxygen; (iii) 2 moles of carbon are burnt in 16 g of dioxygen.
- [5 marks]** Dinitrogen and dihydrogen react with each other to produce ammonia according to the equation $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$. (i) Calculate the mass of ammonia produced if 2.00×10^3 g of dinitrogen reacts with 1.00×10^3 g of dihydrogen. (ii) Will any of the two reactants remain unreacted? (iii) If yes, which one and what would be its mass?
- [3 marks]** Calculate the concentration of nitric acid in moles per litre in a sample which has a density of 1.41 g mL^{-1} and the mass per cent of nitric acid in it being 69%.
- [3 marks]** How much copper can be obtained from 100 g of copper sulphate ($CuSO_4$)? (Atomic mass of Cu = 63.5 u, S = 32 u, O = 16 u)
- [5 marks]** (a) State the law of conservation of mass and the law of definite proportions with one example each. (b) Explain Dalton's atomic theory and state the postulates that were later found to be incorrect.

Chapter 2: Structure of Atom

Section A: Short Answer Questions (2 marks each)

- State Heisenberg's uncertainty principle and write its mathematical expression. What is its significance?
- Write the electronic configurations of Cr ($Z = 24$) and Cu ($Z = 29$). Why do they show exceptional configurations?
- State Pauli's exclusion principle and Hund's rule of maximum multiplicity with one example each.
- Calculate the wavelength, frequency and wavenumber of a light wave whose period is $2.0 \times 10^{-10} \text{ s}$.
- What is the total number of orbitals associated with the principal quantum number $n = 3$? How many electrons can be accommodated in them?
- Differentiate between an orbit and an orbital.
- Which of the following are isoelectronic species? Na^+ , K^+ , Mg^{2+} , Ca^{2+} , S^{2-} , Ar.
- Write the values of all four quantum numbers for the outermost electron of a sodium atom ($Z = 11$).
- What are the drawbacks of Rutherford's nuclear model of the atom?

Section B: Long Answer Questions

10. **[5 marks]** State the postulates of Bohr's model of the hydrogen atom. Derive the expression for the energy of the electron in the n th orbit. State any two limitations of the model.
 11. **[3 marks]** Electromagnetic radiation of wavelength 242 nm is just sufficient to ionise a sodium atom. Calculate the ionisation energy of sodium in kJ mol^{-1} . ($h = 6.626 \times 10^{-34} \text{ J s}$, $c = 3 \times 10^8 \text{ m s}^{-1}$)
 12. **[3 marks]** Calculate the wavelength of an electron moving with a velocity of $2.05 \times 10^7 \text{ m s}^{-1}$. (Mass of electron = $9.11 \times 10^{-31} \text{ kg}$)
 13. **[3 marks]** Calculate the energy associated with the first orbit of He^+ . What is the radius of this orbit?
 14. **[3 marks]** A nitrogen laser produces radiation of wavelength 337.1 nm. If the number of photons emitted is 5.6×10^{24} , calculate the power of this laser (assume 1 s emission time).
 15. **[5 marks]** (a) Explain the photoelectric effect. State the observations made by experiments. (b) How did Einstein explain these observations? Write Einstein's photoelectric equation.
 16. **[5 marks]** Draw the shapes of 1s, 2s, 2p and 3d orbitals. Calculate the number of radial and angular nodes in 3p and 4d orbitals. State the Aufbau principle and the $(n + l)$ rule.
-

Chapter 3: Classification of Elements and Periodicity in Properties

Section A: Short Answer Questions (2 marks each)

1. State the modern periodic law. Why was it necessary to change Mendeleev's periodic law?
2. What is the basic difference between the terms electron gain enthalpy and electronegativity?
3. The first ionisation enthalpy of nitrogen is greater than that of oxygen. Explain.
4. What is the screening (shielding) effect? How does it affect the ionisation enthalpy?
5. Arrange the following in order of increasing ionic radii and justify: O^{2-} , F^- , Na^+ , Mg^{2+} .
6. Write the atomic number of the element present in the third period and seventeenth group of the periodic table. Write its electronic configuration.
7. Electron gain enthalpy of chlorine is more negative than that of fluorine. Explain.
8. What would be the IUPAC name and symbol of the element with atomic number 120? Which block and group would it belong to?
9. Define isoelectronic species. Give two examples of species isoelectronic with Ne.
10. Why are cations smaller and anions larger than their parent atoms?

Section B: Long Answer Questions

11. **[5 marks]** Explain the variation of atomic radius (a) across a period and (b) down a group. Give reasons. Distinguish between covalent, metallic and van der Waals radii.
12. **[5 marks]** What is ionisation enthalpy? Discuss the factors which affect it. Explain why the first ionisation enthalpy of Be is higher than that of B, and why the second ionisation enthalpy is always higher than the first.

13. **[3 marks]** The elements with $Z = 117$ and 120 have not been discovered yet. In which family/group would you place these elements and also give the electronic configuration in each case.
 14. **[5 marks]** Classify the elements into s-, p-, d- and f-blocks. Write the general outer electronic configuration and two characteristics of each block, with examples.
 15. **[3 marks]** Explain the trend of electronegativity across a period and down a group. How is it related to the metallic and non-metallic character of elements?
 16. **[3 marks]** Explain why elements of the same group have similar chemical properties but those of the same period have different properties. Explain with the example of group 1 and period 3 elements.
-

Chapter 4: Chemical Bonding and Molecular Structure

Section A: Short Answer Questions (2 marks each)

1. Define the following terms: (i) bond length (ii) bond angle (iii) bond enthalpy (iv) bond order.
2. Write the Lewis dot structures of CO , CO_3^{2-} and HNO_3 .
3. Define formal charge. Calculate the formal charge on each atom in O_3 .
4. Write the resonance structures of CO_3^{2-} and O_3 . What is the importance of resonance?
5. Explain why NH_3 has a bond angle of 107° while H_2O has a bond angle of 104.5° .
6. Explain why NH_3 has a higher dipole moment than NF_3 , although both have a pyramidal shape.
7. Define hydrogen bond. Distinguish between intermolecular and intra molecular hydrogen bonding with one example each.
8. Differentiate between a sigma (σ) bond and a pi (π) bond.
9. Explain why BeCl_2 and BF_3 are exceptions to the octet rule. Name two other types of exceptions with examples.
10. Define dipole moment. Why is the dipole moment of CO_2 zero while that of H_2O is not?

Section B: Long Answer Questions

11. **[5 marks]** Using the VSEPR theory, predict the shapes of the following: BeCl_2 , BCl_3 , SiCl_4 , AsF_5 , H_2S , PH_3 . Mention the number of bond pairs and lone pairs in each.
12. **[5 marks]** Explain the type of hybridisation and the structure of CH_4 , C_2H_4 and C_2H_2 molecules. Show the formation of σ and π bonds with the help of diagrams.
13. **[5 marks]** Write the molecular orbital configuration of O_2 . Calculate its bond order and explain why it is paramagnetic. Compare the relative stability and magnetic behaviour of O_2^+ , O_2 , O_2^- and O_2^{2-} .
14. **[3 marks]** Explain the formation of the PCl_5 molecule on the basis of sp^3d hybridisation. Why are the axial bonds longer than the equatorial bonds?
15. **[3 marks]** Discuss the shape of the following using hybridisation: (i) SF_6 (ii) NH_4^+ (iii) BF_3 .
16. **[5 marks]** Explain the formation of the following with the help of Molecular Orbital Theory: (i) H_2 molecule (ii) He_2 (does not exist) (iii) N_2 molecule. State the conditions for the combination of atomic orbitals.

Chapter 5: Thermodynamics

Section A: Short Answer Questions (2 marks each)

1. Define the terms system and surroundings. Distinguish between open, closed and isolated systems with one example of each.
2. State the first law of thermodynamics. Write its mathematical expression and the sign conventions for q and w .
3. Differentiate between a state function and a path function. Give two examples of each.
4. Define enthalpy. Derive the relation $\Delta H = \Delta U + \Delta n_g RT$.
5. State Hess's law of constant heat summation. Give two applications.
6. Define standard enthalpy of formation and standard enthalpy of combustion with one example each.
7. Predict the sign of ΔS for the following: (i) $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{O}(\text{g})$ (ii) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$ (iii) $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$.
8. Define spontaneous process. What are the criteria of spontaneity in terms of ΔG ?
9. Define intensive and extensive properties with two examples each.
10. Why is the enthalpy of formation of an element in its standard state taken as zero?

Section B: Long Answer Questions

11. **[3 marks]** Calculate the amount of heat (kJ) necessary to raise the temperature of 60.0 g of aluminium from 35 °C to 55 °C. (Molar heat capacity of Al = 24 J mol⁻¹ K⁻¹; atomic mass of Al = 27 u)
 12. **[3 marks]** The enthalpy of combustion of carbon to CO₂ is -393.5 kJ mol⁻¹. Calculate the heat released upon the formation of 35.2 g of CO₂ from carbon and dioxygen gas.
 13. **[5 marks]** Calculate the enthalpy change on freezing of 1.0 mol of water at 10.0 °C to ice at -10.0 °C. ($\Delta_{\text{fus}} H = 6.03 \text{ kJ mol}^{-1}$ at 0 °C; $C_p[\text{H}_2\text{O}(\text{l})] = 75.3 \text{ J mol}^{-1} \text{ K}^{-1}$; $C_p[\text{H}_2\text{O}(\text{s})] = 36.8 \text{ J mol}^{-1} \text{ K}^{-1}$)
 14. **[3 marks]** Calculate the standard enthalpy of formation of CH₃OH(l) from the following data: $\text{CH}_3\text{OH}(\text{l}) + 3/2 \text{ O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$, $\Delta_r H^\circ = -726 \text{ kJ mol}^{-1}$; $\text{C}(\text{graphite}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g})$, $\Delta_c H^\circ = -393 \text{ kJ mol}^{-1}$; $\text{H}_2(\text{g}) + 1/2 \text{ O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$, $\Delta_f H^\circ = -286 \text{ kJ mol}^{-1}$.
 15. **[3 marks]** For the reaction $2\text{A}(\text{g}) + \text{B}(\text{g}) \rightarrow 2\text{D}(\text{g})$, $\Delta U^\circ = -10.5 \text{ kJ}$ and $\Delta S^\circ = -44.1 \text{ J K}^{-1}$. Calculate ΔG° for the reaction at 298 K, and predict whether the reaction may occur spontaneously.
 16. **[5 marks]** (a) Define entropy. State the second law of thermodynamics in terms of entropy. (b) Write the Gibbs energy equation and discuss, with the help of a table, how the signs of ΔH and ΔS decide the spontaneity of a reaction at different temperatures. (c) Establish the relation between ΔG° and the equilibrium constant K .
 17. **[5 marks]** Explain reversible and irreversible processes. Derive an expression for the work done in the isothermal reversible expansion of an ideal gas from volume V_1 to V_2 . Why is the work done in a reversible process the maximum?
-

Do not copy from guides or the internet; write the answers in your own words. Best wishes for a happy and safe autumn break!

– Chemistry Department, KV INS Kalinga

Biology:

Chapters Covered

Cell: The Unit of Life

Cell Cycle and Cell Division

Biomolecules

Photosynthesis in Higher Plants

NCERT-based questions • Competency-based learning • Diagram practice • Scientific reasoning

General instructions for students

Complete all written work neatly in your Biology notebook.

Answer questions using appropriate biological terminology.

Draw neat, labelled diagrams wherever required.

Practise important NCERT diagrams, tables, definitions and comparisons.

Complete the subject enrichment activities given for each chapter.

Show all steps in numerical and application-based questions.

Use the prescribed NCERT Biology textbook and classroom notes for revision.

Part A – Cell: The Unit of Life

Section I: Long Answer Questions (4–5 marks each)

- Describe the structure of a typical eukaryotic cell with a neat, labelled diagram.
- Explain the structure and functions of the nucleus, including the nuclear envelope, nucleoplasm, nucleolus and chromatin.
- Describe the structure of mitochondria and explain how it is related to ATP production.
- Explain the structure of a chloroplast, including grana, thylakoids, stroma and stroma lamellae.
- Describe the endomembrane system and explain the coordinated functions of the endoplasmic reticulum, Golgi apparatus, lysosomes and vacuoles.
- Explain the structure of the plasma membrane and the significance of its selective permeability.

Section II: Diagram Practice

- Draw and label:
 - A typical plant cell.
 - A typical animal cell.
 - Mitochondrion.
 - Chloroplast.
 - Nucleus.
 - Fluid mosaic model of the plasma membrane.

Part B – Cell Cycle and Cell Division

Section I: Long Answer Questions (4–5 marks each)

- Explain the different phases of the cell cycle with a labelled flowchart.
- Describe the stages of mitosis with suitable diagrams.
- Explain the stages of prophase I of meiosis: leptotene, zygotene, pachytene, diplotene and diakinesis.
- Describe meiosis I and meiosis II and explain how they reduce the chromosome number.
- Compare mitosis and meiosis in terms of chromosome number, number of divisions, daughter cells and biological significance.
- Explain the importance of cell-cycle regulation and the possible consequences of uncontrolled cell division.

Section II: Diagram Practice

- Draw and label:
- Cell-cycle flowchart.
- Stages of mitosis.
- Stages of meiosis I.
- Crossing over between homologous chromosomes.
- Comparison of mitosis and meiosis using a flowchart.

Part C – Biomolecules

Section I: Long Answer Questions (4–5 marks each)

- Classify carbohydrates and explain their structures and biological functions with examples.
- Describe the different levels of protein structure.
- Explain the structure of DNA and RNA and compare their major functions.
- Describe the structure and function of enzymes. Explain the factors affecting enzyme activity.
- Explain the difference between bio macromolecules and micromolecules with examples.
- Describe the major classes of biomolecules and their significance in living organisms.

Section II: Diagram and Practice Work

- Draw the general structure of an amino acid.
- Represent the formation of a peptide bond.
- Draw a nucleotide and label its components.
- Prepare a comparison chart of carbohydrates, proteins, lipids and nucleic acids.
- Draw a labelled graph showing the effect of temperature on enzyme activity.

Part D – Photosynthesis in Higher Plants

Section I: Short Answer Questions (2–3 marks each)

- Write the overall balanced equation for photosynthesis.
- Differentiate between the light-dependent reactions and the Calvin cycle.
- Explain the role of photosystems I and II.
- What is photolysis of water? Mention its products.
- Differentiate between cyclic and non-cyclic photophosphorylation.

- Explain the role of ATP and NADPH in carbon fixation.
- Describe the major steps of the Calvin cycle.
- Differentiate between C₃ and C₄ plants.
- Explain the significance of Kranz anatomy in C₄ plants.
- What is photorespiration, and why does it reduce photosynthetic efficiency?
- Explain how light intensity, carbon dioxide concentration and temperature affect photosynthesis.
- Why is water essential for photosynthesis even though it is not the source of carbon in carbohydrates?

Section II: Long Answer Questions (4–5 marks each)

- Describe the light reactions of photosynthesis, including electron transport, photolysis and ATP formation.
- Explain the Calvin cycle with its three major phases: carboxylation, reduction and regeneration.
- Compare C₃ and C₄ pathways with reference to the first stable product, primary carbon dioxide acceptor, site and photorespiration.
- Explain the significance of chloroplast structure in photosynthesis with a labelled diagram.
- Discuss the major factors affecting the rate of photosynthesis and explain the concept of limiting factors.
- Explain cyclic and non-cyclic photophosphorylation and compare their products.

Section III: Diagram Practice

Draw and label:

- Structure of a chloroplast.
- Photosystems and electron transport in the thylakoid membrane.
- The Calvin cycle.
- C₃ and C₄ pathways in a comparative flowchart.
- A graph showing the effect of light intensity on photosynthetic rate.

Part E– Investigatory Project- Do the project of your own choice.

- Suggested project-file format
- Cover page
- Certificate and acknowledgement, Index
- Aim and research question
- Hypothesis
- Introduction and scientific principle
- Materials required
- Procedure
- Observations, table and labelled drawing
- Results and discussion
- Conclusion
- Precautions and limitations
- Bibliography

PHYSICS:

Chapter 1: Units and Measurements

- What are significant figures? State the rules for determining significant figures and explain how they are used in mathematical calculations.

Chapter 2: Motion in a Straight Line

- Derive the three equations of uniformly accelerated motion using the velocity–time graph.
- Differentiate between distance and displacement, and between speed and velocity. Can the magnitude of displacement be greater than the distance travelled? Justify your answer.

Chapter 3: Motion in a Plane

- Derive expressions for the time of flight, maximum height and horizontal range of a projectile projected at an angle.
- State and explain the parallelogram law of vector addition. Find the magnitude and direction of the resultant of two perpendicular vectors of magnitudes 3 units and 4 units.

Chapter 4: Laws of Motion

- State Newton's three laws of motion and explain each law with one suitable example from everyday life.
- State the law of conservation of linear momentum. Using Newton's laws of motion, derive the principle of conservation of linear momentum for two interacting bodies.
- Define static friction, limiting friction and kinetic friction. Explain the factors on which frictional force depends and distinguish between static and kinetic friction.

Chapter 5: Work, Energy and Power

Define work done by a constant force. Derive the work–energy theorem and explain its significance.

1. State the law of conservation of mechanical energy. Derive the relation showing the conversion of potential energy into kinetic energy for a freely falling body, neglecting air resistance.
2. Chapter 6: System of Particles and Rotational Motion
3. Define centre of mass. Derive the expression for the centre of mass of a system of two particles and explain the meaning of torque and angular momentum.

ARTIFICIAL INTELLIGENCE:

Unit 1: AI For Everyone

SHORT ANSWER QUESTIONS

- Q1.** Define Artificial Intelligence. "AI does not replace human decisions; it adds value to human judgement." Explain this statement with two examples, and list any four tasks that AI can perform.
- Q2.** What is not AI? Explain any four types of machines or systems that are not considered AI, with an example of each.

- Q3.** A calculator can solve arithmetic problems faster than any human, yet it is not considered AI. Justify this statement.
- Q4.** Differentiate between Narrow AI, Broad AI and General AI with one example of each.
- Q5.** Name the three domains of AI. Write the type of input each domain works on.
- Q6.** What is data? Explain structured, unstructured and semi-structured data with one example of each.
- Q7.** Differentiate between NLP, NLU and NLG.
- Q8.** What is a pixel? What is meant by the resolution of an image? How many pixels are there in an image of resolution 1920×1080 ?
- Q9.** What is Cognitive Computing? Write any three of its features and name two examples of cognitive computing software.

LONG ANSWER AND APPLICATION QUESTIONS

- Q10.** Explain the relationship between Artificial Intelligence, Machine Learning and Deep Learning. Draw a diagram to show this relationship.
- Q11.** Describe the structure of an Artificial Neural Network with a labelled diagram. When is a neural network called a Deep Neural Network?
- Q12.** Differentiate between Machine Learning and Deep Learning on any five points.
- Q13.** Explain the three types of Machine Learning (Supervised, Unsupervised and Reinforcement) with the kind of data used and one example algorithm for each.
- Q14.** Identify the type of machine learning in each case and justify your answer: (a) a model is trained on emails labelled "spam" and "not spam"; (b) a shop groups its customers by buying habits without any labels; (c) a robot learns to play a game by receiving points for good moves.
- Q15.** Discuss any four benefits and any four limitations of AI.

Unit 2: Unlocking Your Future in AI

SHORT ANSWER QUESTIONS

- Q16.** List any six job roles in the field of AI. Explain the roles of a Machine Learning Engineer, a Data Scientist and an AI Ethicist.
- Q17.** Explain the technical skills required for a successful career in AI.
- Q18.** Why are soft skills important for AI professionals? Explain any four soft skills.
- Q19.** Write the use of each of these tools: Python, R, Java, C++, TensorFlow, SciPy and NumPy.

LONG ANSWER AND APPLICATION QUESTIONS

- Q20.** Choose any two industries from Agriculture, Healthcare, Retail, Finance, Tourism and Automobile. For each, explain how AI is used, write any three job roles and list the school subjects relevant to them.
- Q21.** A student who likes Biology and Computer Science wants to build a career in AI. Suggest a suitable industry, two job roles, the skills and tools the student should learn, and the school subjects the student should choose.

Unit 3: Python Programming

SHORT ANSWER QUESTIONS

- Q22.** Write any five features of Python. Who created Python and in which year was it released?

- Q23.** What are tokens? Name the five types of tokens in Python with one example of each.
- Q24.** What is an identifier? Write the rules for naming identifiers. Which of these are invalid identifiers and why: 2marks, my_name, class, total-marks, _count, Roll No, marks2?
- Q25.** What are literals? Name the different types of literals in Python with an example of each.
- Q26.** Differentiate between mutable and immutable data types. Classify string, list, tuple and dictionary as mutable or immutable.
- Q27.** What is dynamic typing? What is type casting? Explain with an example using input().
- Q28.** Explain control flow in Python. Name the three types of control statements and the Python statements that come under each.
- Q29.** Explain the for loop with its syntax. What will range(100, 110, 2) generate?
- Q30.** What is a library in Python? What is the purpose of the math library? Write a statement to import it and use the sqrt() function.
- Q31.** What is NumPy? Why is it used in Artificial Intelligence? How is it installed?

LONG ANSWER AND APPLICATION QUESTIONS

- Q32.** Explain the different types of operators in Python with an example of each.
- Q33.** Write the syntax of the if, if-else and if-elif-else statements and give one example of each.
- Q34.** What is a CSV file? Why are datasets used in AI often saved in CSV format? Write the statements to import the csv library, open a file in reading mode, write one row, read all rows and close the file.
- Q35.** What is Pandas? Differentiate between a Series and a DataFrame with an example of each.
- Q36.** Differentiate between loc[] and iloc[] with an example. What is the use of the isnull() function?
- Q37.** Explain any five attributes or functions of a DataFrame (index, columns, dtypes, values, shape, head(n), tail(n)) with their purpose.
- Q38.** What is Scikit-learn? List its key features.
- Q39.** Explain the purpose of load_iris, train_test_split and KNeighborsClassifier. Why is a dataset divided into a training set and a testing set? What is the most common splitting ratio?

Unit 4: Introduction to Capstone Project

SHORT ANSWER QUESTIONS

- Q40.** What is a capstone project? List any four skills that students learn while doing it and give two examples of capstone projects.
- Q41.** Differentiate between critical thinking and creative thinking.
- Q42.** What is problem decomposition? Explain its four steps.
- Q43.** What is a prototype? Why is a prototype not made perfect? Mention three ways of creating a prototype and explain how the Test stage is related to it.
- Q44.** Differentiate between brainstorming, brain dump and brain writing.

LONG ANSWER AND APPLICATION QUESTIONS

- Q45.** Explain the 5W1H method. Apply it to the problem "Students of your school waste food in the canteen" and write a clear problem statement.
- Q46.** Define Design Thinking. Explain its five stages. Why is it called a non-linear and repetitive approach?

- Q47.** What is an Empathy Map? Name its four quadrants. What is a persona and what details does it include?
- Q48.** Create an Empathy Map (Says, Thinks, Does, Feels) for an elderly person who is learning to use a smartphone for digital payments.
- Q49.** What is sustainable development? How many Sustainable Development Goals (SDGs) has the United Nations defined? Choose any two SDGs and suggest an AI-based solution for each.
- Q50.** Prepare a project abstract for a capstone project of your choice that is aligned to an SDG. Include: Project Name, Team Members, Problem Selection, Users Affected, Empathize, Define (5W1H and problem statement), Ideate, Prototype and Test (optional).
- Part B: Programming Questions

Python Basics: Input, Output and Operators

- P1.** Write a program to read the name of a student and the marks in English, Artificial Intelligence and Maths. Display the name, the total marks and the percentage (out of 300).
- P2.** Write a program to read the radius of a circle and display its area and circumference. Use $\pi = 3.14$.
- P3.** Write a program to read two numbers and display the result of all arithmetic operators: +, -, *, /, //, % and **.
- P4.** Write a program to read a temperature in Celsius and convert it to Fahrenheit using $F = C \times 9/5 + 32$.
- P5.** Write a program to read a number using input(), display it with its data type, convert it first to int and then to float, and display the value and data type after each conversion.

Selection Statements: if, if-else, if-elif-else

- P6.** Write a program to read the marks of a student (out of 100) and display the grade using an if-elif-else ladder: 90 and above is A, 75 and above is B, 60 and above is C, 33 and above is D, otherwise Fail.
- P7.** Asmita goes to a restaurant. Write a program that displays the menu "Veg | Nonveg | Mixed", reads the choice in any case (use lower()) and displays a suitable welcome message for each choice. Display "Invalid choice" for any other input.
- P8.** Write a program to read three numbers and display the largest of them.
- P9.** A park charges a ticket based on age: below 5 years is free, 5 to 12 years is Rs. 50, 13 to 59 years is Rs. 100 and 60 years and above is Rs. 60. Write a program to read the age and display the ticket price.
- P10.** Write a program to read the weight (in kg) and height (in metres) of a person, calculate BMI = weight / (height × height) and display the category: below 18.5 is Underweight, below 25 is Normal, below 30 is Overweight, otherwise Obese.

Loops, Lists, Strings and Dictionaries

- P11.** Write a program to display the even numbers between 100 and 120 along with their squares, in the form "100 squared is 10000". Use range() with a step value.
- P12.** Write a program to read a number n and display the sum and the average of the first n natural numbers using a for loop.
- P13.** Write a program to display every element of the list below along with its data type using type().

GIVEN

```
lst = [45, "AI", 3.14, (1, 2), True, 200]
```

- P14.** Write a program to read a sentence, split it into a list of words, and display each word with its length. Also display the total number of words.
- P15.** Write a program to display each student with the marks, the names of students who scored above 80, and the name of the topper from the dictionary below.

GIVEN

```
marks = {"Asha": 78, "Ravi": 91, "Meera": 85, "John": 67, "Fathima": 94}
```

- P16.** Write a program to read 5 numbers from the user into a list using a loop. Display the list, the sum, the largest number and the smallest number.

CSV Files

- P17.** Write a program to create a file students.csv using the csv module. The first row must be the header (RollNo, Name, Class, TrName), followed by at least four student records written using writerow(). Open the file with newline="" in writing mode.
- P18.** Write a program to open students.csv in reading mode using csv.reader() and display every record.
- P19.** Write a program to read students.csv, count the number of records (excluding the header row) and display the names of all students of a class entered by the user.

NumPy

- P20.** Create a 2-D NumPy array from the list of tuples below (marks of 3 students in 3 subjects). Display the array and its shape.

GIVEN

```
marks = [(78, 85, 90), (66, 72, 80), (91, 88, 95)]
```

EXPECTED OUTPUT (KEY LINES)

```
[[78 85 90]
```

```
 [66 72 80]
```

```
 [91 88 95]]
```

```
(3, 3)
```

- P21.** Write a program to read the size n and then n numbers from the user into a NumPy array created using np.empty(). Display the array, the sum of its elements and the largest element.
- P22.** Create the NumPy arrays a = [10, 20, 30] and b = [1, 2, 3]. Display a + b, a - b, a * b and a / b.

Pandas

- P23.** Create a Pandas Series from the list of names below. Display the Series with its index and then display the element at index 2.

GIVEN

```
names = ["Rakesh", "Ajit", "Abheshk", "Anil"]
```

- P24.** Create three NumPy arrays [55, 60, 65], [70, 75, 80] and [85, 90, 95]. Using them, create a DataFrame with columns T1, T2 and T3 and display it.
- P25.** Create a DataFrame from the list of dictionaries below with the index Asha, Ravi and Meera. Display the DataFrame, use isnull() to find the missing values and display the number of missing values in each column.

GIVEN

```
[{"Maths": 80, "Science": 75},  
 {"Maths": 90, "Science": 85, "AI": 95},  
 {"AI": 70}]
```

- P26.** Create the DataFrame Result given below. Then: (a) add a new column John with marks 70, 75, 82; (b) add a new row English with marks 80, 76, 88, 72 using loc[]; (c) delete the row Science; (d) delete the column Ravi; (e) display the marks of AI using loc[] and the first row using iloc[]. Display the DataFrame after each step.

GIVEN

	Asha	Ravi	Meera
Maths	78	66	91
Science	85	72	88
AI	90	80	95

- P27.** Create the DataFrame Teacher given below. Display its index, columns, dtypes, values, shape, the first 2 rows using head(2) and the last 2 rows using tail(2).

GIVEN

	XI	XII
Physics	Anita	Suresh
Maths	Rahul	Divya
AI	Meena	Kiran

- P28.** Read students.csv (created earlier) into a DataFrame using read_csv() and display it. Add a new column Section with values A, B, A, B and export the DataFrame to a new file students_out.csv using to_csv().

Scikit-learn

Revise first: load_iris, train_test_split, KNeighborsClassifier, fit(), predict(), accuracy.

P29. Write a program to load the Iris dataset using load_iris. Display the feature names, the target names, the shape of the data and the first 5 rows of the data.

EXPECTED OUTPUT (KEY LINES)

Shape of data: (150, 4)

P30. Split the Iris dataset into training and testing sets in the ratio 80:20 using train_test_split (use random_state = 42). Display the number of samples in the training set and in the testing set.

EXPECTED OUTPUT (KEY LINES)

Training samples: 120

Testing samples: 30

P31. Train a KNeighborsClassifier with n_neighbors = 3 on the training set of the Iris dataset (80:20 split, random_state = 42). Predict the classes of the testing set and display the accuracy of the model.

EXPECTED OUTPUT (KEY LINES)

Accuracy: 1.0

CLASS-12

HINDI:

नोट-

1 कार्य को अपनी आभ्यास पुस्तिका (notebook) में कीजिए।

2 कार्य को सुंदर और साफ़ लेखें ।

प्रश्न 1-पाठ कवितावली व लक्ष्मणमूर्दा का अर्थ लिखकर सभी प्रश्नों को हल करें।

प्रश्न 2-अतीत के दबे पाँव का सारांश लिखकर सभी प्रश्नों को हल करें।

प्रश्न 3- रुबाइयाँ व गजल पाठ के अर्थ व सभी प्रश्नों के उत्तर लिखें ।

प्रश्न 4-शरदकालीन अवकाश में अपने बिताये हुए समय का अनुभव लिखें ।

प्रश्न 5- फीचर एवं आलेख लेखन क्या है। इनकी विशेषताएँ व दोनों में अंतर लिखें।

ENGLISH:

**KENDRIYA VIDYALAYA SANGATHAN REGIONAL OFFICE, JABALPUR ENGLISH CORE- Code
No. 301**

PRE BOARD EXAMINATION 2025-26 CLASS-XII

Time allowed: 3 Hrs.

Maximum Marks: 80

General Instructions

- i. This question paper has 13 questions. All questions are compulsory.
- ii. This question paper contains three sections:
Section A: Reading Skills, Section B:
Creative Writing Skills Section C:
Literature.
- iii. Attempt all questions based on specific instructions for each part. Write the correct question number and part thereof in your answer sheet.
- iv. Separate instructions are given with each question/part, wherever necessary.
- v. Adhere to the prescribed word limit while answering the questions.

SECTION A READING SKILLS

22 marks

1. Read the following passages.

(12)

The evening air was thick with the scent of rain, and the lamps along the platform glowed dimly through the mist. Jonathan stood near the edge, his suitcase at his feet, glancing every few seconds at the clock above the ticket office. The train to Waverley was late again—just as it had been the night before.

He was a man of careful habits, one who disliked uncertainty. Yet tonight, as the hands of the clock crept past eight, a curious restlessness stirred in him. Perhaps it was the journey itself, or the letter folded neatly in his pocket—the one written in his sister’s familiar, hurried hand, summoning him home after so many silent years.

A porter shuffled past, humming softly and lighting the lamps. A group of soldiers laughed near the far bench, their voices rising and falling in bursts, like the flicker of the lanterns. Jonathan watched them absently, wondering at their easy companionship. The sound made his solitude sharper.

At last, the faint rumble of wheels echoed through the fog. The train emerged, steam billowing like breath into the cold air. Jonathan lifted his case, but hesitated. He could still return to the inn, pretend he had missed it, write to his sister tomorrow. Yet he knew that excuse had worn thin with time.

As he climbed aboard, a woman brushed past him, clutching a small basket. A child's toy—a wooden horse—fell from it and rolled beneath the seat. Jonathan picked it up and handed it to her. She smiled, a little breathless. "Thank you. It's his favourite."

Her kindness was brief, ordinary, yet it softened something inside him. He took his seat by the window. The train shuddered, then moved. Town lights slipped away into darkness.

He drew out the letter once more. The words were simple: "Come home. Mother is not well. We both need you."

Outside, the rain began again, tapping lightly against the glass—steady, persistent, like the ticking of time he had ignored for years.

Answer the following questions, based on the passage above.

- I. Which line shows Jonathan's impatience while waiting? 1
- II. The writer describes the lamps and mist mainly to create a mood of _____ 1
- III. Jonathan's hesitation before boarding the train suggests his —
A. excitement B. uncertainty C. anger D. confidence 1
- IV. What type of statement is made in "Come home. Mother is not well."?
A. command B. request C. warning D. announcement 1
- V. What detail indicates Jonathan's loneliness at the station? 1
- VI. What does the child's wooden horse symbolize in the story? 1
- VII. The repeated mention of rain and time suggests —
A. a dull environment B. Jonathan's regret and passage of time C. nature's indifference D. his desire for adventure 1
- VIII. What does the encounter with the woman and child reveal about Jonathan's emotional state? (Answer in about 40 words) 2
- IX. How does the author use setting and imagery to reflect Jonathan's inner conflict? (Answer in about 40 words) 2

X. Choose the most suitable main idea of the passage:

A. A man returns home after years of estrangement and self-reflection

B. A delayed train journey through a rainy night

C. A chance meeting between two travellers

D. The beauty of railway journeys

1

2. Read the following carefully.

10

1. A recent nationwide survey conducted by the National Reading Foundation (NRF) examined the reading habits of 3,000 young people aged 16–25 across India. The objective was to study how digital technology and lifestyle changes have influenced the choice of reading materials and the time spent on reading. Respondents were from both urban and rural regions and represented diverse educational and socioeconomic backgrounds.

2. The study revealed that while 92% of the respondents still read something daily, the format and purpose of reading have undergone significant transformation. Digital reading, through blogs, news apps, and social media posts, dominates, while traditional print reading such as novels and newspapers has declined. Reading is often linked more to information gathering or entertainment rather than leisure or reflection.

3. The data collected is summarized below:

Type of Reading Material	Average Daily Time Spent (in minutes)	Percentage of Youth Engaged
Social Media Content	45	82%
News Articles/Online Blogs	25	67%
E-books or Digital Novels	20	41%
Printed Books (fiction/non-fiction)		

15

29%

Newspapers/Magazines

10

24%

4. The findings highlight a growing shift towards fast, concise, and image-rich content, reflecting a global trend of shorter attention spans. Interestingly, rural youth, though less digitally connected, showed slightly higher engagement with printed material compared to urban youth. Experts suggest that while digital reading increases accessibility, it may reduce comprehension and critical thinking due to fragmented attention.

5. The study concludes that educational institutions must promote balanced reading habits—encouraging deep reading along with digital literacy—to strengthen analytical and reflective skills among students. Libraries, teachers, and parents play a vital role in integrating technology without losing the joy and discipline of sustained reading.

Answer the following questions, based on your reading of the the above passage.

I. What was the main objective of the survey conducted by the National Reading Foundation?

1

II. Fill in the blank with the correct option.

Digital reading has largely replaced _____ forms of reading among youth.

A) reflective B) printed C) academic D) professional

1

III. Based on the data table, which type of reading material engages the least number of young readers?

1

IV. What does the phrase “fast, concise, and image-rich content” suggest about the reading preferences of today’s youth?

2

V. With reference to paragraph 4, why might digital reading reduce comprehension and critical thinking?

2

VI. Suggest any two ways educational institutions can encourage balanced reading habits, as discussed in the passage.

1

VII. “Rural youth showed slightly higher engagement with printed material.” What does this reveal about the influence of technology on reading habits?

1

VIII. Which of the following aspects is NOT addressed in the passage?

1

A) Gender differences in reading habits

B) Role of schools and parents in promoting reading

C) Impact of digital reading on comprehension

D) Urban-rural reading pattern differences

SECTION B CREATIVE WRITING SKILLS (18 marks)

3. Attempt any one of the two, (A) or (B), in about 50 words

1x4=4

A. You are Ritika Sharma, Cultural Secretary of Sunrise Public School, Delhi. Your school is organising an Inter-School Music and Dance Competition to celebrate Cultural Harmony Week. Write a notice inviting entries from students of Classes XI and XII. Include details about the event date, venue, categories, and last date for registration. Put the notice in a box.

OR

B. You are Aditya Verma, President of the Readers’ Forum, City Library, Lucknow. The library is launching a “Readathon Challenge” to promote reading habits among youth. Write a notice

informing members about the event, rules for participation, prizes, and registration details. Put the notice in a box.

4. Attempt any one of the two, (A) or (B), in about 50 words.

1x4=4

You are Aarav Mehta, Head Boy of Starlight Public School, Pune. Your school is organising an Inter-School Debate Competition on “Artificial Intelligence: Boon or Bane?” Draft a formal invitation inviting the Principal of Bright Future School to act as a judge for the event. Include all necessary details.

OR

You are Sanjana, living at 27, Green Park, New Delhi. You are turning 18 and plan to host a small get-together and movie night at your home to celebrate the occasion.

Write an informal invitation to your close friend Nisha, inviting her to the celebration.

5. Attempt any one of the two, (A) or (B), in 120-150 words

1x5=5

A. You are Aarohi Menon, a student of Class XII, residing at E-27, Nehru Nagar, Bengaluru. Write a letter to the Editor of The Daily Herald, expressing concern over the rising use of AI tools among students for academic work. Highlight how over-reliance on technology can affect creativity, critical thinking, and originality in learning. Suggest measures schools can take to promote responsible and ethical use of technology.

Use your own ideas and the following cues:

- Increasing dependence on AI tools for homework and essays
- Decline in analytical and creative writing skills
- Importance of digital ethics and awareness programs
- Role of teachers and parents in guiding responsible use

OR

B. You are Rishabh Tandon, a Commerce graduate from Indore University, currently living at 23, Lake View Apartments, Indore. You have come across the following advertisement in The Career Journal for the post of Finance Assistant at Bright Wave Solutions Pvt. Ltd. Write a letter applying for the post, including your bio-data.

6. Attempt any one of the two, (A) or (B), in 120-150 words

1x5=5

A. You are Tanya Kapoor, a student of Class XII, Bluebell Senior Secondary School, Pune. You feel that while technology connects people globally, it has also made real human connections fragile. Write an article for your school magazine on the topic that we are connected yet alone. It is a Paradox of Social Media.

Use your own ideas and the following cues:

- Increased online interaction but emotional isolation
- Impact on friendships, family bonds, and communication skills
- Need for balance between online and offline life
- Role of digital mindfulness and responsible usage

OR

B. You are Amaan Sheikh, Cultural Secretary of Riverview International School, Dehradun. Your school organised a unique event called “*Night Under the Stars*” – an open-air astronomy and

music festival for students and parents. Write a report for the school magazine describing the event, its highlights, and participants' response.

Use your own ideas and the following cues:

- Organisation and purpose of the event
- Activities: stargazing, telescope workshops, student band performances
- Student and parent participation
- Learning outcomes and concluding remarks

SECTION C LITERATURE (40 marks)

7. Read the following extracts and solve ANY ONE of the given two, (A) or (B).

(1x6=6)

A. *Now we will count to twelve and we will all keep still.*

*For once on the face of the Earth let's not
speak in any language,*

let's stop for one second,

*and not move our arms so much. It
would be an exotic moment without
rush, without engines, we would all be
together*

in a sudden strangeness.

(Keeping Quiet)

I. What is the poet's intention behind asking everyone to "keep still"? (1)

II. Complete the following appropriately:

The phrase "without rush, without engines" symbolically suggests the poet's appeal for _.(1)

III. How does the poet's use of the expression "an exotic moment" create an atmosphere of universality and harmony? (1)

IV. Fill in the blank with the correct option:

The word "strangeness" here primarily implies a feeling of _____(discomfort / unfamiliar peace / collective confusion / social isolation). (1)

V. What change in human behaviour does the poet expect as a result of this moment of silence? Chose the correct option: (1)

- a) People will understand the importance of material success.
- b) Humanity will introspect and develop mutual understanding.
- c) Society will value language diversity more deeply.
- d) Individuals will seek personal entertainment.

VI. All of the following statements are true about the extract, EXCEPT – (1)

- a) The poet criticizes human haste and mechanical living.
- b) The appeal for stillness is equated with passivity and inactivity.
- c) The idea of silence is linked to global unity.
- d) The poet envisions peace arising from collective reflection.

OR

B. *Therefore, on every morrow, are we wreathing A
flowery band to bind us to the earth,
Spite of despondence, of the inhuman dearth Of noble
natures, of the gloomy days,
Of all the unhealthy and o'er-darkened ways*

Made for our searching:

(A Thing of Beauty)

I. What does the expression “wreathing a flowery band” metaphorically suggest about human connection with nature? (1)

II. Complete the sentence suitably:

The contrast between “flowery band” and “inhuman dearth” emphasizes the conflict between _____ (1)

III. How does the poet’s choice of imagery evoke both hope and despair in the extract?(1)

IV. Fill in the blank with the correct option:

The phrase “unhealthy and o’er-darkened ways” refers to _____. (1)

- (a) the poet’s disillusionment with industrial progress
- (b) the moral and emotional decline of mankind
- (c) the excessive admiration of material pleasures
- (d) the lack of natural beauty in human life

V. Which of the following best interprets the poet’s purpose in this extract? (1)

- a) To glorify the endless cycle of human suffering.
- b) To show that beauty offers solace amidst despair.
- c) To suggest that happiness lies in material possessions.
- d) To reject nature as a source of inspiration.

VI. All of the following are true for the extract, EXCEPT – (1)

- a) The poet presents beauty as a life-sustaining force.
- b) The repetition of dark imagery suggests hopelessness.
- c) The contrast between beauty and gloom deepens the emotional impact.
- d) The tone reflects optimism despite human suffering.

8. Read the following extracts and solve ANY ONE of the given two, (A) or (B).

(4×1=4)

A. *“I have killed the hundredth tiger. My vow has been fulfilled,” the Maharaja was overcome with elation. Ordering the tiger to be brought to the capital in grand procession, the Maharaja hastened away in his car. After the Maharaja left, the hunters went to take a closer look at the tiger. The tiger looked back at them rolling its eyes in bafflement. The men realised that the tiger was not dead; the bullet had missed it. It had fainted from the shock of the bullet whizzing past. The hunters wondered what they should do. They decided that the Maharaja must not come to know that he had missed his target. If he did, they could lose their jobs. One of the hunters took aim from a distance of one foot and shot the tiger. This time he killed it without missing his mark.*
(The Tiger King)

I. What does the Maharaja's reaction to the tiger's supposed death reveal about his character and priorities as a ruler? (1)

II. Complete the sentence suitably:

The hunters' decision to remain silent despite knowing the truth reflects their

_____ . (1)

III. How does the author use irony in this situation to criticise the Maharaja's obsession with power and pride? (1)

IV. Choose the correct option to complete the statement:

The description of the tiger fainting rather than dying primarily serves to highlight—

- a) the humour in human error
- b) the futility of blind arrogance
- c) the bravery of the Maharaja's men
- d) the skill of the royal hunters (1)

OR

B. *We discussed our fate some moments, and when Judewin said, 'We have to submit, because they are strong,' I rebelled.*

'No, I will not submit! I will struggle first!' I answered. I watched my chance, and when no one noticed, I disappeared. I crept up the stairs as quietly as I could in my squeaking shoes — my moccasins had been exchanged for shoes. Along the hall I passed, without knowing whither I was going. Turning aside to an open door, I found a large room with three white beds in it. The windows were covered with dark green curtains, which made the room very dim. Thankful that no one was there, I directed my steps toward the corner farthest from the door. On my hands and knees, I crawled under the bed, and huddled myself in the dark corner. (Memories of Childhood)

I. What does the narrator's reaction to Judewin's advice reveal about her sense of identity and resistance? (1)

II. Complete the sentence suitably:

The exchange of moccasins for squeaking shoes symbolises _____. (1)

III. How does the narrator's act of hiding under the bed serve as a metaphor for her emotional and cultural struggle? (1)

IV. Choose the correct statement that best interprets the narrator's defiance:

- a) It reflects her ignorance of the situation.
- b) It symbolises her rejection of forced assimilation.
- c) It indicates her dependence on her friends.
- d) It shows her fear of physical punishment. (1)

9. Read the following extracts and solve ANY ONE of the given two, (A) or (B).

(1x6=6)

A. *I started for school very late that morning and was in great dread of being scolded, especially because M. Hamel had said that he would question us on participles, and I did not know the first word about them. For a moment I thought of running away and spending the day out of doors.*

It was so warm, so bright! The birds were chirping at the edge of the woods, and in the open field back of the sawmill the Prussian soldiers were drilling. It was all much more tempting than the rule for participles, but I had the strength to resist and hurried off to school.

When I passed the town hall, there was a crowd in front of the bulletin-board. For the last two years, all our bad news had come from there — the lost battles, the draft, the orders of the commanding officer — and I thought to myself, without stopping, “What can be the matter now?”
(The Last Lesson)

I. Select the option that best reflects Franz’s internal conflict in this extract. (1)

- A. Curiosity about the news vs. fear of punishment
- B. Joy of freedom vs. duty toward learning
- C. Anger at the invaders vs. guilt of negligence
- D. Interest in war vs. interest in grammar

II. Fill in the blank with the most appropriate word:

The tone of the narrator in the line “What can be the matter now?” best conveys his sense of _____. (1)

III. What does the reference to “Prussian soldiers drilling” symbolise in the context of the extract? (1)

IV. Which of the following best explains the contrast between Franz’s surroundings and his thoughts? (1)

- 1. Nature’s beauty vs. human oppression
- 2. Joy of childhood vs. burden of fear
- 3. Carefree morning vs. strict discipline
- 4. A student’s duty vs. external control

Select the most suitable option:

- A. 1 and 3
- B. 2 and 4
- C. 1 and 2
- D. 3 and 4

V. In what way does this extract serve as foreshadowing for the events that follow in the story? (1)

VI. Complete the following sentence suitably:

The crowd at the bulletin-board contributes to the mood of _____ and prepares the reader for _____. (1)

OR

B. This settlement was adopted unanimously by the commission. Gandhi explained that the amount of the refund was less important than the fact that the landlords had been obliged to surrender part of the money and, with it, part of their prestige. Therefore, as far as the peasants were concerned, the planters had behaved as lords above the law. Now the peasant saw that he had rights and defenders. He learned courage.

Events justified Gandhi’s position. Within a few years the British planters abandoned their estates, which reverted to the peasants. Indigo sharecropping disappeared.

(Indigo)

I. Fill in the blank by choosing the correct option from those given in the brackets. (1)

Gandhi considered the refund amount to be less important than the landlords' surrender because it symbolised the _____.

(economic gain / moral victory / end of indigo cultivation)

II. Select the option that best represents the shift in power highlighted in the extract.

(1)

- A. From planters to British officials
- B. From peasants to landlords
- C. From landlords to peasants
- D. From Gandhi to the commission

III. What does the phrase "lords above the law" reveal about the social hierarchy before Gandhi's intervention? (1)

- A. The landlords were accountable to the government.
- B. The landlords exploited the peasants without restraint.
- C. The peasants held equal rights under the law.
- D. The British authorities strictly controlled the landlords.

IV. Which line from the extract best shows the long-term impact of Gandhi's leadership on the peasants? (1)

- A. "The amount of the refund was less important..."
- B. "Events justified Gandhi's position."
- C. "The planters had behaved as lords above the law."
- D. "This settlement was adopted unanimously."

V. Complete the sentence suitably: (1)

The peasants' realization that they had rights and defenders marks the beginning of their journey from _____ to _____.

VI. What broader idea does the disappearance of indigo sharecropping symbolise in the context of India's freedom struggle? (1)

- A. The end of colonial trade monopoly and social injustice.
- B. The peasants' rejection of agricultural work.
- C. Gandhi's retreat from active politics.
- D. The British government's complete withdrawal from India.

10. Answer any five of the following six questions in 40 -50 words each:

(5x2=10)

I. How does the peddler's transformation in 'The Rattrap' highlight the redemptive power of compassion and trust?

II. What does Sophie's fascination with Danny Casey in Going Places reveal about her outlook towards life and reality?

III. In 'The Interview', how does Umberto Eco's perspective on his writing process challenge the traditional notion of time management and creativity?

IV. What does Aunt Jennifer's act of creating tigers on her tapestry symbolise about her inner desires and unexpressed emotions? (Aunt Jennifer's Tigers)

V. In what way, Robert Frost uses the contrast between the rural poor at the roadside stand and the indifferent city dwellers to highlight social injustice and the growing divide between urban prosperity and rural deprivation? (A Roadside Stand)

VI. Discuss, how Anees Jung in 'Lost Spring' portrays the loss of childhood innocence through the lives of street children like Saheb and Mukesh?

11. Answer any two of the following three questions in 40 -50 words each:

(2x2=4)

I. What makes the author use the stark and pristine landscape of Antarctica to make students reflect on the fragility of Earth's ecosystem and the urgent need for sustainable living? (Journey to the End of the Earth)

II. How does Mr. Lamb's attitude towards life challenge Derry's belief that physical appearance determines one's happiness and social acceptance? (On the Face of It)

III. Dr. Sadao's internal conflict between his duty as a doctor and his loyalty to his country highlight the moral dilemmas faced by individuals during wartime. Elucidate. (The Enemy)

12. Answer any one of the following two questions, in about 120-150 words.

(1x5=5)

A. How does the poem "My Mother at Sixty-Six" by Kamala Das go beyond a personal moment of separation to reflect universal emotions of love, fear, and the inevitable passage of time? Discuss how the poet's use of imagery and tone deepens the theme of human mortality.

OR

B. Drawing inspiration from "Deep Water" by William Douglas, explain how the author's journey from fear to courage can be applied to real-life situations where individuals confront psychological or emotional challenges. How does his experience serve as a lesson in resilience and self-mastery for today's youth?

13. Answer any one of the following two questions, in about 120-150 words

(1x5=5)

A. "The Third Level" by Jack Finney uses the idea of escapism through time travel to comment on human anxiety in the modern world. Discuss how Charley's longing for the third level reflects deeper psychological needs and the universal desire to escape the pressures of contemporary life.

OR

B. Pearl S. Buck uses a balanced and objective narrative technique in "The Enemy" enhance the moral complexity of the story. Discuss how her descriptive realism, third-person point of view, and calm tone help readers understand Dr. Sadao's inner conflict and evoke empathy for both the Japanese and the American characters.

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**KENDRIYA VIDYALAYA SANGATHAN, BANGALORE REGION PRE BOARD 1
EXAMINATION 2025-26**

SUBJECT: ENGLISH CORE (Code: 301)

CLASS: XII

Time allowed : 3 hours

Maximum Marks: 80

General Instructions

Read the following instructions very carefully and follow them:

i. This question paper has 13 questions. All questions are compulsory.

ii. This question paper contains three sections:

Section A: Reading Skills,

Section B: Creative Writing

Skills Section C: Literature.

iii. Attempt all questions based on specific instructions for each part. Write

SECTION A: READING SKILLS (22 Marks)

1.	Read the following passages.	12
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Gone are the days when malnutrition would mean a sickly thin child. Now it covers a spectrum that refers to deficiencies, excesses, or imbalances in a child's intake of energy or nutrients. The new century is a harbinger of new sights and technology. Keeping up with the times is also the changing face of malnutrition in kids. In the 21st Century, malnutrition has taken the form of an ugly three-headed monster - the one that combines under nutrition, poor vitamin and mineral status, and overweight.

Under nutrition which includes low weight-for-height or wasting, low height-for-age or stunting and underweight which is low weight-for-age. Under nutrition makes children vulnerable to all kinds of diseases and can even be life-threatening. This is usually treatable and preventable too. Low weight-for-age means the child has recently undergone severe weight loss, either due to diarrhea or any other health condition. Low height-for-age usually means long standing lack of nutritious food. This can be traced back to poor nutrition when the child was in the mother's womb, poor nutrition as a child and frequent illness. Stunting can severely limit a child in terms of its intelligence and physical capabilities. Underweight children can be so either due to stunting or wasting or due to both.

Micro nutrient malnutrition is deficiency of vitamins and minerals which are collectively called micro nutrients and they are required for healthy growth and development. Children who display difficult eating behavior or those who do not consume a variety of foods might not be meeting their vitamin and mineral requirements. Most of the times, absorption could also be an issue. Deficiencies of

	iodine, vitamin A and iron is a global health problem with many children deficient in them. Gone are the days when a cherubic baby was a sign of a healthy baby. Overweight or obesity means a child is much too heavy for their age. This predicament is because there is an imbalance between consumption of calories and expenditure. Sugar and fat laden drinks and snacks are responsible for this. Excess fat can impair health. The big three faces of malnutrition pose many issues at the individual and at the country level. For starters, all forms of malnutrition can lead to diet- related non-communicable diseases such as heart attacks and stroke, and often linked with high blood pressure. At a country level, lack of productivity from malnourished individuals and increase in healthcare costs pose an economic burden on the country. Nation-wide efforts are needed to tackle this problem of malnutrition. Access to safe, nutritious foods even to the economically disadvantaged societies, providing nutrition education for families to make the correct dietary choice and improving assessment and nutrition monitoring can help weed and rectify malnutrition early. Source (Hindustan Times/ Malnutrition and its three big forms parents must be wary of/ By Dr Pankaj Garg / Oct 07, 2021 /444 words)	
	Answer the following questions, based on the passage above.	
I	Select the option that classifies writer's view on changing definition of emerging causes of malnutrition in wake of 21 century (1 Mark) (a) Poverty and starvation (b) Lack of nutrition literacy (c) Opulent resources (d) Lack of resources	
II	Pick the option that correctly indicates a condition of a malnourished child : Mark) 1. Wasted 2. Obese 3. Normal 4. Stunted (a) 2,3,4 (b) 1,2,3 (c) 1,2,4 (d) 1.3.4	1

II	Share evidence from the text to support the view that the writer is urging for immediate intervention, detection and prevention of malnutrition.	2																				
<table><tr><td></td><td>Column I</td><td></td><td>Column II</td></tr><tr><td>1</td><td>Stunting</td><td>(i)</td><td>Thinner than normal weight</td></tr><tr><td>2</td><td>Obese</td><td>(ii)</td><td>Shorter than normal height</td></tr><tr><td>3</td><td>Wasting</td><td>(iii)</td><td>Overweight than normal</td></tr><tr><td>4</td><td>Underweight</td><td>(iv)</td><td>both thinner and shorter than normal</td></tr></table>				Column I		Column II	1	Stunting	(i)	Thinner than normal weight	2	Obese	(ii)	Shorter than normal height	3	Wasting	(iii)	Overweight than normal	4	Underweight	(iv)	both thinner and shorter than normal
	Column I		Column II																			
1	Stunting	(i)	Thinner than normal weight																			
2	Obese	(ii)	Shorter than normal height																			
3	Wasting	(iii)	Overweight than normal																			
4	Underweight	(iv)	both thinner and shorter than normal																			

IV	Match the conditions appropriately: (a) 1-iv, 2-iii, 3-ii, 4-i (b) 1-i, 2-ii, 3-iii, 4-iv (c) 1-ii, 2-iii, 3-i, 4-iv (d) 1-iii, 2-ii, 3-iv, 4-i	1
V	Who are the ugly three-headed monster that the writer blames for malnutrition (1 Marks) (a) Under nutrition, micro nutrient related deficiency and overweight (b) Micro nutrient adequacy, obesity and stunting (c) wasting, overweight and vitamin adequacy (d) stunting, excess nutrition and minerals adequacy	
VI	Explain, why a cherubic baby is no longer considered a healthy baby	2
VII	How malnutrition could be a threat to economic growth of a nation ?	1
VIII	"Nation needs to tackle malnutrition holistically ". What strategies need to be employed to prevent malnutrition and improve nutrition among children.	2
IX	Identify the relation among the given set of words/ phrase and fill the blank with the appropriate one phrase Nutrition literacy : healthy child : Nutrition ignorance : -----	1

Q2	1. Introduction: In the hasty lifestyle of today's world, the choice of snacks can greatly impact one's health and well-being. This case study aims to analyse the preference for seasonal fruits compared to packaged snacks among different age groups and the implications for overall health. 2. Methodology: A survey was conducted among individuals across various age groups, ranging from children to seniors, to determine their snacking preferences. Participants were asked to indicate their preferred snack choices and provide reasons for their preferences. The data was then analysed to identify trends and patterns among different age demographics. 3. Survey Examination: The survey encompassed a comprehensive examination of snacking habits, including not only preferred snack choices but also delving into the underlying motivations and influences guiding these choices. Beyond mere preference, participants were	10
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	encouraged to articulate the reasons behind their selections, providing invaluable insights into the multifaceted nature of snacking behavior. 4. Results: The survey results revealed interesting insights into snacking preferences among different age groups: 5. Implications for Interventions: By discerning the diverse preferences among different age groups, policymakers and health practitioners can tailor interventions to address specific demographic needs. For instance, targeting educational campaigns towards parents could empower them to instill healthy eating habits in their children from an early age. Concurrently, efforts to mitigate the influence of advertising and peer pressure on teenagers could involve regulatory measures and educational initiatives aimed at promoting critical thinking and informed decision-making. Furthermore, the prominence of seasonal fruits as a preferred snack choice among middle-aged adults and senior's points towards the importance of promoting access to fresh produce and nutritional education across all age demographics. 6. Conclusion: The survey outcomes serve as a roadmap for designing targeted interventions that not only cater to diverse demographic needs but also nurture a culture of health and well-being. By harnessing the insights gleaned from this study, stakeholders can collaboratively work towards building healthier communities and promoting sustainable practices for generations to come. (Created for Academic Usage / 315 words)	
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	Answer the following questions, based on the given passage. i. Complete the following suitably. 1m In the introduction, the researcher links a hasty lifestyle with the choice of snacks in the study to highlight_____. ii. What would the following be classified as? 1m To examine snacking preferences across various age groups in detail, and assess health implications. Select the appropriate response. a) Primary purpose b) Method of analysis c) Secondary objective d) Research outcome	
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	iii. Give two points to support why it is likely that fresh fruits were given as an option to the survey participants to choose from in the study on snacking preferences. 2m iv. Paragraph 3 includes words – ‘motivations’ and ‘influences.’ 1m Classify the following sentences as 'influence' or 'motivation': Sentence 1: Peer pressure leads teenagers to prefer packaged snacks over healthier options. Sentence 2: The drive to maintain health as one ages makes middle-aged adults to choose seasonal fruits. v. Read the following: 1m Seema regularly enjoys snacking on chips and cool drinks while watching movies. Mohan, her neighbour, prefers to snack on oranges and also some nuts occasionally. Arindam, who lives across, often tends to eat a mix of carrot sticks and instant noodles, in between meals. Select the option that identifies the correct demographic Seema, Mohan and Arindam belong to. a) Seema – young adult; Mohan – teenager; Arindam -middle-age b) Seema - teenager; Mohan – middle-age; Arindam -child c) Seema – young adult; Mohan – child; Arindam - teenager d) Seema - teenager; Mohan – elderly; Arindam -young adult vi. Although children, middle-aged, and elderly groups all prefer seasonal fruits, why is the preference percentage highest among the elderly? 1m vii. Analyse how targeted interventions based on the diverse snacking preferences of different age groups can lead to improved health outcomes. (Paragraph 5) 2m viii. What is the ultimate goal for stakeholders, based on the insights from the study? 1m a) Increase profitability through enhanced snack marketing b) Building healthier communities c) Reducing the cost of healthcare services d) Expanding the range of available snack product	
SECTION B : CREATIVE WRITING SKILLS (18 marks)		
3.	Attempt any one of the two, (A) or (B), in about 50 words	1 x 4 =4
A	Your school is planning to conduct an inter-class seminar on the topic-The Importance of Mental Health-to create awareness in adolescents. As the head of the organising committee, write a notice to inform all students about the seminar and invite registrations from classes XI-XII. Include other necessary details. Put your notice in a box. OR	

B	Your school is organising an inter-House webinar on enhancing coding skills, As the President of the Computer Club, write a notice to inform all House members from IX-XII about the webinar and specify the number of registrations invited per House. Include other	
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	necessary details. Put your notice in a box.	
4.	Attempt any one of the two, (A) or (B), in about 50 words	1 x 4 =4
A	Draft a formal invitation in card format not more than 50 words from Vani Gopalan, Chief Project Officer of an NGO, for the launch of the 'Each One Teach One' programme, addressed to school Principals and Coordinators. Mention a compelling highlight of the programme along with other necessary details	
B	An invitation had been issued by Mr. Cherian, the HR Head of your company inviting you for the company picnic. As Joseph Vijayan, Asst. Manager, Operations, draft a informal reply in not more than 50 words, consenting to attend.	
5.	Attempt any one of the two, (A) or (B), in 120-150 words	1x5=5
A	Financial literacy is increasingly recognised as a crucial 21st-century skill for young individuals. Write a letter to the editor of a local daily discussing the benefits of providing financial literacy education to children. Also, suggest effective ways to raise awareness about the importance of this education among parents and guardians. You may use some of the given cues along with your own ideas to draft the letter. You are a counsellor, Chitra Mahapatra from Puri, Odisha. ✓ Skills learned during childhood tend to have a lasting impact. ✓ Understanding the power of finances beneficial for young learners. ✓ The long-term benefits of learning financial independence from a young age	
OR		
B	You are Maya Syiem from Shillong. You read the given advertisement and wish to apply for the post advertised. Write this job application along with your bio-data. Join our Creative Team! A renowned publishing house in Shillong -A NEW WORLD- is seeking a talented illustrator for children's books. Creative individuals with a passion for storytelling through art, welcome. Experience, not mandatory. Team players with degree/ diploma in Fine Arts/ Graphic Design may apply with 5 samples from portfolio illustrating a variety of work. Write to the Project Lead, 23-C Rosewood Lane, Shillong-793005	
6.	Attempt ANY ONE of two in about 120-150 words.	5

A	In an era of rapid globalisation and technological advancement, the preservation of cultural heritage remains a vital challenge, particularly for the youth. India continues to navigate the complexities of maintaining tradition alongside modernity. Write an article exploring the role of cultural heritage in shaping the identities of today's Indian youth. Provide examples to illustrate your points wherever necessary. You may use some of the given cues along with your own ideas. You are Arti Nirula of Class XII-A. • The benefits of preserving cultural heritage for young people. It contributes to their sense of identity and community • Suggest ways in which young people and institutions can work together to ensure the preservation of cultural heritage • Global interactions and technologies influenced or changed these traditional practices among today's youth	
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	OR	
B	You are Hina Aziz, student of Class XII-D and a member of the school magazine editorial board. Write a comprehensive report detailing the activities undertaken by students as part of the celebrations on Yoga Day. Include descriptions of the events, participation details, and the overall impact of these activities on the school community. You may organise your report by following - Who - What – When – Where – Why – How	

SECTION C : LITERATURE TEXTBOOK
AND SUPPLEMENTARY READING TEXT (40 marks)

7	Read the following extracts and solve ANY ONE of the given two, (A) or (B).	6
A.	<i>And such too is the grandeur of the dooms We have imagined for the mighty dead; All lovely tales that we have heard or read: An endless fountain of immortal drink, Pouring unto us from the heaven's brink.</i>	
I	Which of the following themes is best represented in the given extract? (a) The beauty of nature (b) The power of imagination (c) The immortality of art and literature (d) The inevitability of death	1
II	State whether the given statement is TRUE or FALSE, with reference to the extract. By referring to the dead as "mighty", the poet emphasizes their importance and the power they exerted on the people.	1
III	Complete the sentence appropriately. The "endless fountain of immortal drink" is an apt analogy for the tales of the mighty dead because _____.	1

IV	The use of the word "brink" in the extract suggests that the immortality that is being poured onto us is on the verge of overflowing. Explain the imagery used in the last two lines.	1
V	Based on the poem rhyme scheme, evident in lines 2-5, of the given extract, which word would rhyme with line 1? (Said / think / tombs)	1
VI	Select the option that is NOT true about the lack of punctuation at the end of line 1 in the extract (a) Creates a sense of continuity and flow that connects the line with the second line. (b) Encourages the reader to continue reading seamlessly without any pause. (c) Creates a sense of anticipation and expectation for the reader. (d) Encourages a revisit to the ideas in the preceding lines.	1
OR		
B	 I looked again at her, wan, pale as a late winter's moon and felt that old familiar ache, my childhood's fear, but all I said was, see you soon, Amma, all I did was smile and smile and smile..... (My Mother at Sixty-six)	
I	What is the speaker's emotional state when looking at her mother? (a) Confused and disoriented (b) Nostalgic and longing (c) Empathetic and understanding (d) Fearful and apprehensive	1

II	What does the use of the word "but" at the beginning of the line, but all I said..", suggest?	1
III	Select the word that WILL NOT complete the sentence appropriately. The description of the mother as "wan, pale / as a late winter's moon" creates a vivid image of: (a) vulnerability (b) sensitivity (c) frailty (d) mortality	1
IV	State whether the given statement is TRUE or FALSE The poetic device used in the line, 'pale as a winter's moon' is the same as the one used in the line, 'the winter wind wistfully waisted at night'.	1
V	What message do these lines highlight, in the context of familial relationships, and the speaker's sense of anxiety and fear at the prospect of losing her mother?	1

VI	Complete the sentence appropriately. The repetition of the word, 'smile' suggests that _____.	1
8	Read the following extracts and solve ANY ONE of the given two, (A) or (B)	4
A	Climate change is one of the most hotly contested environmental debates of our time. Will the West Antarctic ice sheet melt entirely? Will the Gulf Stream ocean current be disrupted? Will it be the end of the world as we know it? Maybe. Maybe not. Either way, Antarctica is a crucial element in this debate not just because it's the only place in the world, which has never sustained a human population and therefore remains relatively 'pristine' in this respect; but more importantly, because it holds in its ice-cores half-million-year-old carbon records trapped in its layers of ice. (Journey to the End of the Earth	
I	How does the absence of a human population in Antarctica make it significant in the climate change debate? (1)	1
II	Why is "climate change" described as a "hotly contested" issue in the extract provided? This is so, because there _____. (a) is universal agreement on the causes and implications of climate change (b) is a planned path ahead about how to address climate change (c) are differing views on the causes and implications of climate change (d) are minimal reports of fresh threats to climate change	1
III	The analogy of a time machine is an appropriate analogy for the role of carbon records in the study of climate change because _____.	1
IV	Give one reason why the writing style of the extract can be called factual and informative.	1
OR		
B.	In other words, the Tiger King is dead. The manner of his death is a matter of extraordinary interest. It can be revealed only at the end of the tale. The most fantastic aspect of his demise was that as soon as he was born, astrologers had foretold that one day the Tiger King would actually have to die. "The child will grow up to become the warrior of warriors, hero of heroes, champion of champions. But..." they bit their lips and swallowed hard. When compelled to continue, the astrologers came out with it. "This is a secret which should not be revealed at all. And yet we are forced to speak out. The child born under this star will one day have to meet its death." (<i>The Tiger King</i>)	
I	Complete the sentence appropriately. The author's purpose in using foreshadowing, is to _____.	1

II	In the given extract, what emotion were the astrologers feeling when they "bit their lips and swallowed hard"? (a) Humiliation (b) Disbelief (c) Grief (d) Unease	1
III	Which trait are the astrologers lauding when they say "warrior of warriors, hero of heroes, champion of champions"?	1
IV	How is the line, "the most fantastic aspect of his demise", an example of contrast?	1
9	Read the following extracts and solve ANY ONE of the given two, (A) or (B).	6
A.	Usually, when school began, there was a great bustle, which could be heard out in the street, the opening and closing of desks, lessons repeated in unison, very loud, with our hands over our ears to understand better, and the teacher's great ruler rapping on the table. But now it was all so still! I had counted on the commotion to get to my desk without being seen; but, of course, that day everything had to be as quiet as Sunday morning. Through the window I saw my classmates, already in their places, and M. Hamel walking up and down with his terrible iron ruler under his arm. I had to open the door and go in before everybody. You can imagine how I blushed and how frightened I was. <i>(The Last Lesson)</i>	
I	List any two sensory details present in this extract.	1
II	Why does the protagonist feel anxious about entering the classroom on this particular day? (a) The classmates have started the lesson (b) The teacher is in a bad mood (c) The classroom is too quiet (d) The protagonist is running late	1
III	Complete the sentence appropriately. The phrase "as quiet as Sunday morning" suggests that	1
IV	Pick evidence from the extract that helps one infer that this was not the protagonist's first time being late to school.	1
V	What does the term 'terrible iron ruler' indicate about M. Hamel?	1
VI	Which of the following headlines best suggests the central idea of the extract? (a) The Fears of a Latecomer (b) The Importance of Punctuality (c) The Rigidity of the School System (d) The Anxiety of a Young Student	1
OR		

B.	Unaware of what his name represents, he roams the streets with his friends, an army of barefoot boys who appear like the morning birds and disappear at noon. Over the months, I have come to recognise each of them. "Why aren't you wearing chappals?" I ask one. "My mother did not bring them down from the shelf," he answers simply." Even if she did, he will throw them off," adds another who is wearing shoes that do not match. When I comment on it, he shuffles his feet and says nothing. "I want shoes," says a third boy who has never owned a pair all his life. Travelling across the country I have seen children walking barefoot, in cities, on village roads. It is not lack of money but a tradition to stay barefoot, is one explanation. (Lost Spring)	
I	What is the writer's purpose in allowing the boys to speak for themselves via dialogue, as	1

	opposed to only a writer's commentary?	
II	The line, "It is not lack of money but a tradition to stay barefoot" can be best classified as: (a) a fact (b) an opinion (c) a theme (d) a plot point	1
III	Explain any one possible inference that can be drawn from the line, "an army of barefoot boys who appear like the morning birds and disappear at noon",	1
IV	Identify the line from the text that bears evidence to the fact that the writer's association with the boys is not a recent one.	1
V	Based on the context provided in the extract, select the most likely comment that the writer would have made, based on the boy's reaction to the mismatched shoes. (a) "Why are your shoes mismatched? That's not a good look." (b) "Don't worry about your shoes, you can wear a matching pair later." (c) "I like your shoes. What matters is that they protect your feet." (d) "Have you chosen to mismatch your shoes?"	1
VI	Complete the sentence with ONE word. The phrase "he answers simply", suggests that the boy's response to the writer's question about why he wasn't wearing chappals was ____.	1
10	Answer any five of the following six questions in 40 50 words each :	5 x 2=10
I	What can be inferred from Rajendra Prasad's recorded upshot of the lawyer consultations, at Motihari? <i>[Reference - The senior lawyer replied, they had come to advise and help him; if he went to jail there would be nobody to advise and they would go home. What about the injustice to the sharecroppers, Gandhi demanded.]</i> (Indigo)	

II	Douglas uses sensory details to create a vivid image of the unfortunate experience in the pool. What might be the impact on the reader if the narration were more informative than sensory? (Deep Water)	
III	How does the setting of the remote forest location in 'The Rattrap' contribute to the overall tone and mood of the story?	
IV	What philosophical insight does the poet intend to convey by linking the fisherman's non-aggression toward the whales with the salt-gatherer's painful, self-inflicted injury?	
V	Why did Sophie fantasize Danny Casey ?	
VI	Subbu's character embodies both creativity and servitude in the film industry. How does Ashokamitran highlight this in 'Poets and Pancakes'.	
11	Answer any two of the following three questions in 40 -50 words each :	2 x 2=4
I	What impact is Mr. Lamb's death likely to have on Derry's future emotional development and social integration?	
II	How does the inclusion of the "Toy Tiger" in the climax of Kalki's "The Tiger King" function as a satirical device to highlight the Maharaja's fatal hubris and ultimately underscore the central irony of his life?	

III	How did Zitkala-Sa find the 'eating by formula' a hard trial?	
12	Answer any one of the following two questions, in about 120-150 words.	1 x 5=5
A	Imagine you are Pablo Neruda, the poet of <i>Keeping Quiet</i>. What advice might you offer to Robert Frost, the poet of <i>A Roadside Stand</i>, in the context of his conflicted emotions, as displayed in the given lines- <i>The requisite lift of spirit has never been found, Or so the voice of the country seems to complain, I can't help owning the great relief it would be To put these people at one stroke out of their pain.</i> Pen down your advice, in a letter to Frost. You may begin this way: <i>Dear Robert I recently read your poem, "A Roadside Stand," and... You may end this way: I hope this advice is helpful to you. Please let me know if there is anything else I can do to support you. Warmly, Pablo Neruda</i>	
OR		
B	The different portrayals of women in the texts 'Aunt Jennifer's Tigers', 'Going Places 'Lost Spring', and 'My Mother at Sixty-six', offer insights into the experiences of women in society. You have been asked to address your peers and share- - the ways these portrayals highlight the diversity of the female experience. - the importance of understanding each individual woman's challenges and experiences. Compose this draft, with reference to any three of these prescribed texts listed above. You may begin this way: <i>Good morning, everyone. As I analysed the allotted texts...</i> You may end this way. <i>To conclude, I'd like to say that..</i>	
13	Answer any one of the following two questions, in about 120-150 words	5
A	The influence of belief in traditions such as religion, family bonds and patriotism can be used to develop narrative techniques like setting, motivation, sources of conflict, and pacing. Analyse how the writer has incorporated such influences to good effect in the story, <i>The Enemy</i>. Support your answer with valid textual evidence. OR	
B	To what extent do Jack Finney's use of stream of consciousness and the blurring of fantasy and reality serve as the primary narrative engine for conveying Charlie's profound need for escapism and his idealized view of the past?	

MATHS:

1. Find the points on the line $\frac{x+2}{3} = \frac{y+1}{2} = \frac{z-3}{2}$ at a distance of 5 units from the point $P(1, 3, 3)$. (2M)
2. Three vectors $\vec{a}$, $\vec{b}$ and $\vec{c}$ satisfy the condition $\vec{a} + \vec{b} + \vec{c} = \vec{0}$. Evaluate the quantity $\mu = \vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a}$, if $|\vec{a}| = 3$, $|\vec{b}| = 4$ and $|\vec{c}| = 2$. (3M)
3. Find the vector and Cartesian equations of the lines which is perpendicular to the lines with equations $\frac{x+2}{1} = \frac{y-3}{2} = \frac{z+1}{4}$ and $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and passes through the point $(1, 1, 1)$. Also find the angle between the given lines. (3M)
4. If $|\vec{a}| = 2$, $|\vec{b}| = 7$ and $\vec{a} \times \vec{b} = -3\hat{i} + \hat{j} + 2\hat{k}$, find the angle between $\vec{a}$ and $\vec{b}$. (2M)
5. Find the co-ordinates of the foot of the perpendicular drawn from the point $A(-1, 8, 4)$ to the line joining points $B(0, -1, 3)$ and $C(2, -3, -1)$. Hence find the image of the point A in the line BC . (5M)
6. The equation of a line is $5x - 3 = 15y + 7 = 3 - 10z$ Write the direction cosines of the line (2M)
7. Find the values of p , so that the lines $l_1: \frac{1-x}{3} = \frac{7y-14}{p} = \frac{z-3}{2}$ and $l_2: \frac{7-7x}{3p} = \frac{y-5}{1} = \frac{6-z}{5}$ are perpendicular to each other. Also, find the equation of a line passing through a point $(3, 2, -4)$ and parallel to line l_1 . (5M)
8. Show that the points A, B, C with position vectors $2\hat{i}-\hat{j}+\hat{k}$, $\hat{i}-3\hat{j}-5\hat{k}$ and $3\hat{i}-4\hat{j}-4\hat{k}$ respectively, are the vertices of a right-angled triangle. Hence find the area of the triangle (3M)
9. If $\vec{a} = 4\hat{i} + 5\hat{j} - \hat{k}$, $\vec{b} = -\hat{i} + 4\hat{j} - 5\hat{k}$, then find another vector $\vec{d}$ which is perpendicular to both $\vec{a}$ and $\vec{b}$, and such that $\vec{c} \cdot \vec{d} = 21$ where $\vec{c} = 3\hat{i} + \hat{j} - \hat{k}$. (3M)
10. Find the shortest distance between the Lines:
 $\vec{r} = (3\hat{i} + 2\hat{j} - 4\hat{k}) + \lambda(\hat{i} + 2\hat{j} + 2\hat{k})$ and $\vec{r} = (5\hat{i} - \hat{j}) + \mu(3\hat{i} + 2\hat{j} + 6\hat{k})$. Also, find whether the lines are intersecting or not (5M).
11. Find a vector of magnitude 6, perpendicular to each of the vectors $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$, where $\vec{a} = \hat{i} + \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} + 3\hat{k}$.
12. Find the area of a parallelogram whose adjacent sides are $2\hat{i}-4\hat{j}+5\hat{k}$ and $3\hat{i}-6\hat{j}+2\hat{k}$.
13. Find a vector in the direction of vector $\vec{a} = \hat{i} - 2\hat{j}$ that has magnitude 7 units
14. Find the projection of the vector $\hat{i} + 3\hat{j} + 7\hat{k}$ on the vector $7\hat{i} - \hat{j} + 8\hat{k}$.
15. If $\vec{a} = 4\hat{i} + 5\hat{j} - \hat{k}$, $\vec{b} = -\hat{i} + 4\hat{j} - 5\hat{k}$, then find another vector $\vec{d}$ which is perpendicular to both $\vec{a}$ and $\vec{b}$, and such that $\vec{c} \cdot \vec{d} = 21$ where $\vec{c} = 3\hat{i} + \hat{j} - \hat{k}$
16. If $A = \begin{pmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{pmatrix}$, then find a matrix X such that $A^2 - 5A + 4I + X = 0$.
17. Solve the system of equations $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$; $\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$; $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$
- 18.. For two matrices $A = \begin{bmatrix} 3 & -6 & -1 \\ 2 & -5 & -1 \\ -2 & 4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -2 & -1 \\ 0 & -1 & -1 \\ 2 & 0 & 3 \end{bmatrix}$, find the product AB and hence solve the system of equations: $3x - 6y - z = 3$, $2x - 5y - z + 2 = 0$ and $-2x + 4y + z = 5$

19. If $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 3 \\ 1 & -2 & 1 \end{bmatrix}$ then find A^{-1} and hence solve the system of system of linear equations: $x + y + z = 6$, $y + 3z = 7$ and $x - 2y + z = 0$

20. If $A = \begin{bmatrix} -1 & a & 2 \\ 1 & 2 & x \\ 3 & 1 & 1 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1 & -1 & 1 \\ -8 & 7 & -5 \\ b & y & 3 \end{bmatrix}$, find the value of $(a+x) - (b+y)$

21. Let N be the set of natural numbers and R be the relation on $N \times N$ defined by $(a, b) R (c, d)$ iff $ad = bc$ for all $a, b, c, d \in N$. Show that R is an equivalence relation.

22. Let $f: R - \left\{-\frac{4}{3}\right\} \rightarrow R$ be a function defined as $(x) = \frac{4x}{3x+4}$. Show that f is a one one function. Also check whether f is an onto function or not

23. A function $f: [0, \infty) \rightarrow [-5, \infty)$ be defined by $f(x) = 3x^2 + 9x - 5$

Prove that the function is a one-one and on-to function.

24. 1. Minimize $Z = 5x + 10y$ subject to the constraints; $x + 2y \leq 120$; $x + y \geq 6$; $x - 2y \geq 0$; $x, y \geq 0$.

25. Maximize $Z = 3x + 9y$ Subject to constraints $x + 3y \leq 60$, $x + y \geq 10$, $x \leq y$, $x, y \geq 0$
Solve the above L.P.P graphically.

26. Solve the following linear programming problem graphically: Maximise $z = 600x + 400y$, Subject to constraints: $x + 2y \leq 12$, $2x + y \leq 12$, $x + 1.25y \geq 5$, $x \geq 0$, $y \geq 0$

27. The corner points of the feasible region determined by the system of linear inequalities are $(0,0)$, $(4,0)$, $(2,4)$, and $(0,5)$. If the maximum value of $Z = ax + by$, where $a, b > 0$ occurs at both $(2,4)$ and $(4,0)$, then

a) $a = 2b$ b) $2a = b$ c) $a = b$ d) $3a = b$

28. Which of the following points is not in the feasible region of the constraints: $x + 2y \leq 8$, $3x + 2y \leq 12$, $x \geq 0$, $y \geq 0$.

(A) $(0, -1)$ (B) $(0, 1)$ (C) $(2, 2)$ (D) $(4, 0)$

SCIENCE:

Biology:

Chapters Covered

- Principles of Inheritance and Variation
- Molecular Basis of Inheritance
- Evolution

NCERT-based assignments • Diagrams • Investigatory project

General instructions for students

1. Complete the written assignments neatly in your Biology notebook.
2. Answer all questions using appropriate scientific terminology and labelled diagrams.
3. Practise NCERT in-text and exercise questions from all three chapters.
4. Give special attention to Mendelian crosses, pedigree analysis, molecular processes, numerical problems and evolutionary evidence.
5. Attempt the previous-year-style questions under examination conditions before checking your notes.
6. Prepare one investigatory project using the project guidelines provided below.

7. Use the prescribed NCERT textbook and the current CBSE syllabus as the final reference for examinable topics.

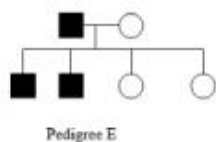
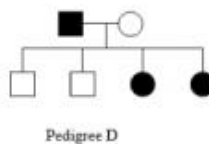
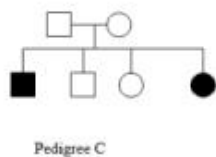
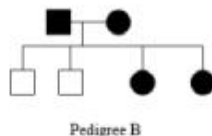
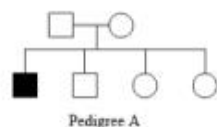
Part A – Principles of Inheritance and Variation

Section I: Short answer questions (2–3 marks each)

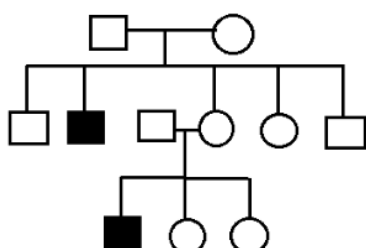
1. Explain Mendel's law of dominance with a suitable example.
2. Differentiate between incomplete dominance and codominance with examples.
3. Explain the inheritance of ABO blood groups in humans.
4. Why is the test cross useful in determining an unknown genotype?
5. Differentiate between monohybrid and dihybrid crosses.
6. Explain sex determination in human beings with a cross diagram.
7. What are sex-linked traits? Explain X-linked inheritance using haemophilia as an example.
8. Explain the significance of pedigree analysis in studying inheritance.
9. Differentiate between linkage and recombination.
10. Explain how mutations can produce genetic variation.
11. Write short notes on Down syndrome, Turner syndrome and Klinefelter syndrome.
12. Why are Mendel's pea plant experiments considered important in the development of genetics?

Section II: Long answer questions (4–5 marks each)

1. Explain a dihybrid cross and show how it supports the law of independent assortment.
2. Explain sex-linked inheritance using a suitable cross involving colour blindness.
3. Describe Mendel's monohybrid cross and explain the genotypic and phenotypic ratios in the F_2 generation.
4. Explain Morgan's work on *Drosophila* with the help of all three crosses.
5. Explain how linkage and crossing over influence the inheritance of traits.
6. Explain Sickle cell anemia, Thalassemia and Phenylketonuria.
7. Solve these pedigree and mention the traits and genotype.



Pedigree F



Part B – Molecular Basis of Inheritance

Section I: Short answer questions (2–3 marks each)

1. Explain the structure of a DNA nucleotide.
2. State Chargaff's rules and explain their significance.
3. Differentiate between DNA and RNA.
4. Explain the semiconservative mode of DNA replication.
5. Describe the role of DNA polymerase, helicase and ligase in DNA replication.
6. Differentiate between transcription and translation.
7. Explain the roles of mRNA, tRNA and rRNA in protein synthesis.
8. What is the genetic code? State any three important properties.
9. Explain the significance of the start and stop codons.
10. What is the lac operon? Explain the role of the inducer.
11. Mention the major objectives of the Human Genome Project.
12. Explain the principle and two applications of DNA fingerprinting.

Section II: Long answer questions (4–5 marks each)

1. Describe the Watson–Crick model of DNA with a labelled diagram.
2. Explain DNA replication with a suitable diagram and describe its semiconservative nature.
3. Explain transcription in prokaryotes, including initiation, elongation and termination.
4. Describe translation and explain the role of ribosomes, tRNA and mRNA.
5. Explain the lac operon and how gene expression is regulated in the presence and absence of lactose.
6. Describe the major goals and important findings of the Human Genome Project.
7. Explain DNA fingerprinting, its principle and its applications.

Part C – Evolution

Section I: Short answer questions (2–3 marks each)

1. Differentiate between homologous and analogous organs with examples.
2. Explain adaptive radiation with a suitable example.
3. Describe the major ideas of Darwin's theory of natural selection.
4. Explain how fossils provide evidence for evolution.
5. Differentiate between divergent and convergent evolution.
6. What is industrial melanism? Explain how it illustrates natural selection.
7. Explain the significance of genetic drift in small populations.
8. State the Hardy–Weinberg principle and name four factors that can disturb genetic equilibrium.
9. Explain how mutations and recombination contribute to evolution.
10. Differentiate between Lamarckism and Darwinism.
11. What is speciation? Explain the importance of reproductive isolation.
12. Write a short note on human evolution using examples of major evolutionary stages.

Section II: Long answer questions (4–5 marks each)

1. Explain the evidence for evolution from fossils, comparative anatomy and molecular biology.
2. Describe Darwin's theory of natural selection and explain it with a suitable example.
3. Explain the Hardy–Weinberg principle and its significance in population genetics and solve one problem related to this principle.
4. Discuss the major factors responsible for changes in allele frequencies in populations.
5. Explain adaptive radiation with suitable examples.
6. Describe the major stages in human evolution, highlighting important characteristics.

Part D – Investigatory Project- Do the project of your own choice.

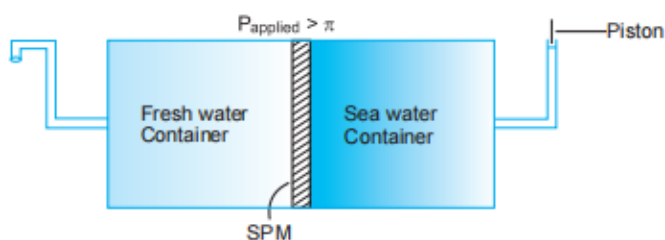
Suggested project-file format

1. Cover page
2. Certificate and acknowledgement, Index

3. Aim and research question
4. Hypothesis
5. Introduction and scientific principle
6. Materials required
7. Procedure
8. Observations, table and labelled drawing
9. Results and discussion
10. Conclusion
11. Precautions and limitations
12. Bibliography

Chemistry: CHAPTER -1 (SOLUTIONS)

- 1 (a) Define the following terms : (i) Ideal solution (ii) Osmotic pressure
 (b) Calculate the boiling point elevation for a solution prepared by adding 10 g CaCl_2 to 200 g of water, assuming that CaCl_2 is completely dissociated.
 (Kb) for water = $0.512 \text{ K kg mol}^{-1}$; Molar mass of $\text{CaCl}_2 = 111 \text{ g mol}^{-1}$ Ans : 0.69 K
 - 2 (a) What type of deviation is shown by a mixture of ethanol and acetone? Give reason.
 (b) A solution of glucose (molar mass = 180 g mol^{-1}) in water is labelled as 10% (by mass). What would be the molality and molarity of the solution? (Density of solution = 1.2 g mL^{-1})
 - 3 (a) Vapour pressure of pure water at 298 K is 23.8 mm Hg. 50 g of urea NH_2CONH_2 is dissolved in 850 g of water. Calculate the vapour pressure of water for this solution and its relative lowering. Ans: 0.0173
 (b) Explain types of azeotropes with graph.
 4. (a) The depression in freezing point of water observed for the same amount of acetic acid, trichloroacetic acid and trifluoroacetic acid increases in the order given above. Explain briefly.
 (b) Henry's law constant for the molality of methane in benzene at 298 K is $4.27 \times 10^5 \text{ mm Hg}$. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg. Ans : 178×10^{-5} .
- Q5.



- (a) Given alongside is the sketch of a plant for carrying out a process.
 - (i) Name the process occurring in the given plant.
 - (ii) To which container does the net flow of solvent take place?
 - (iii) Name one SPM which can be used in this plant.
 - (iv) Give one practical use of the plant.
- b) A solution containing 15 g urea (molar mass = 60 g mol^{-1}) per litre of solution in water has the same osmotic pressure (isotonic) as a solution of glucose (molar mass = 180 g mol^{-1}) in water. Calculate the mass of glucose present in one litre of its solution.

Ans. b) 45 g

CHAPTER -2 (ELECTROCHEMISTRY)

- Calculate emf and ΔG for the following cell : $\text{Mg(s)}/\text{Mg}^{2+}(0.001\text{M})//\text{Cu}^{2+}(0.0001\text{M})/\text{Cu(s)}$;
 $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$, $E^\circ_{\text{Mg}^{2+}/\text{Mg}} = -2.37\text{V}$
- Calculate $\Delta_r G^\circ$ for the reaction at 25°C : $\text{Au(s)} + \text{Ca}^{2+}(1\text{M}) \rightarrow \text{Au}^{3+}(1\text{M}) + \text{Ca(s)}$,
 $E^\circ_{\text{Ca}^{2+}/\text{Ca}} = -2.87\text{V}$, $E^\circ_{\text{Au}^{3+}/\text{Au}} = +1.50\text{V}$. Predict whether the reaction will be spontaneous or not at 25°C which of the above two half cells will act as an oxidizing agent and which one will be a reducing agent?
- Calculate the emf of the cell . The following chemical reaction is occurring in an electrochemical cell. $\text{Mg(s)} + 2\text{Ag}^+(0.0001\text{M}) \rightarrow \text{Mg}^{2+}(0.10\text{M}) + 2\text{Ag(s)}$ The electrode values are $\text{Mg}^{2+}/\text{Mg} = -2.36\text{V}$ $\text{Ag}^+/\text{Ag} = 0.81\text{V}$. For this cell calculate / write (a) (i) E° value for the electrode $2\text{Ag}^+/\text{Ag}$ (ii) Standard cell potential E°_{cell} . (b) Cell potential (E) cell (c) (i) Symbolic representation of the above cell. (ii) Will the above cell reaction be spontaneous?
- A voltaic cell is set up at 25°C With the following half cells : $\text{Al(s)}/\text{Al}^{3+}(0.001\text{M})$ and $\text{Ni}^{2+}(0.50)/\text{Ni(s)}$, Write the equation for the cell reaction that occurs when the cell generates an electric current and determine the cell potential (given $E^\circ_{\text{Ni}^{2+}/\text{Ni}} = -0.25\text{V}$, $E^\circ_{\text{Al}^{3+}/\text{Al}} = -1.66\text{V}$).
- One half cell in a voltaic cell is constructed from a silver wire dipped in silver nitrate solution of unknown concentration . The other half cell consists of a zinc electrode in a 0.10M solution of Zinc nitrate. A voltage of 1.48V is measured for this cell. Use this information to calculate the concentration of silver nitrate solution.
 $(E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.763\text{V}$,
 $E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80\text{V})$

CHAPTER -3 (CHEMICAL KINETICS)

- The following results have been obtained during the kinetic studies of the reaction :

$2\text{A} + \text{B} \rightarrow \text{C} + \text{D}$			
Experiment No.	[A]	[B]	Initial rate of formation of D
i	0.1 M	0.1 M	$6.0 \times 10^{-3} \text{ M min}^{-1}$
ii	0.3 M	0.2 M	$7.2 \times 10^{-2} \text{ M min}^{-1}$
iii	0.3 M	0.4 M	$2.88 \times 10^{-1} \text{ M min}^{-1}$
iv	0.4 M	0.1 M	$2.40 \times 10^{-2} \text{ M min}^{-1}$

Calculate the rate of formation of D when $[\text{A}] = 0.5 \text{ mol L}^{-1}$ and $[\text{B}] = 0.2 \text{ mol L}^{-1}$.

Ans : $1.2 \times 10^{-1} \text{ mol L}^{-1} \text{ min}^{-1}$

- For the hydrolysis of methyl acetate in aqueous solution, the following results were obtained :

t/s	0	30	60
$[\text{CH}_3\text{COOCH}_3]/\text{mol L}^{-1}$	0.60	0.30	0.15

(i) Show that it follows pseudo first order reaction, as the concentration of water remains constant.

(ii) Calculate the average rate of reaction between the time interval 30 to 60 seconds.

Ans: (i) $k = 0.0231 \text{ s}^{-1}$ (ii) $5 \times 10^{-3} \text{ mol L}^{-1} \text{ s}^{-1}$

- (i) Define half-life of a reaction. Write the expression of half-life for (a) zero order reaction and (b) first order reaction.

(ii) The rate constants of reaction at 500 K and 700 K are 0.02 s^{-1} and 0.07 s^{-1} respectively.

Calculate the value of activation energy, E_a . Ans: (ii) $E_a = 18228.07 \text{ J mol}^{-1}$

4. (i) The first order rate constant for the decomposition of ethyl iodide by the reaction :

$\text{C}_2\text{H}_5\text{I}(\text{g}) \rightarrow \text{C}_2\text{H}_4(\text{g}) + \text{HI}(\text{g})$ at 600 K is $1.6 \times 10^{-5} \text{ s}^{-1}$. Its energy of activation

is 209 kJ mol^{-1} . Calculate the rate constant of reaction at 700 K.

(ii) How does a change in temperature affect the rate of a reaction? How can this effect on the rate constant of reaction be represented quantitatively? Ans : (i) $6.34 \times 10^{-3} \text{ s}^{-1}$

5. (i) A first order reaction has a rate constant value of 0.00510 min^{-1} . If we begin with 0.10 M concentration of the reactant, how much of the reactant will remain after 3.0 hours?

(ii) Explain the difference between the average rate and instantaneous rate of chemical reaction.

Ans : (i) 0.04 M

CHAPTER -4 (D AND F BLOCK ELEMENTS)

1. What is lanthanoid contraction? Give its cause and consequences.

2.(i) Differentiate between lanthanoids and actinoids.

(ii) what is misch metal ? What are its uses?

3 (a) Write the method of preparation of potassium dichromate.

(b) What is the effect of pH on dichromate ion?

4 . Explain giving reasons:

a. Transition metals and many of their compounds show paramagnetic behavior.

b. The enthalpies of atomization of the transition metals are high.

c. The transition metals generally form coloured compounds.

d. Transition metals and their many compounds act as good catalysts.

e. Scandium ($Z = 21$) is a transition element but zinc ($Z = 30$) is not?

5. a). What is the state of hybridization of Mn in MnO_4^- ?

b) Write an application of potassium permanganate.

c) What are the products formed after heating potassium permanganate?

d) How many electrons are involved in oxidation by KMnO_4 , in different mediums?

CHAPTER -5 (COORDINATION COMPOUNDS)

1(i) What is crystal field splitting energy? How does the magnitude of Δ_0 decide the actual configuration of d-orbitals in a coordination entity?

(ii) Explain the difference between a weak field ligand and a strong field ligand.

(iii) Predict the number of unpaired electrons in $[\text{Pt}(\text{CN})_4]^{2-}$.

2(i) Aqueous copper sulphate solution (blue in colour) gives: (i) a green precipitate with aqueous potassium fluoride and (ii) a bright green solution with aqueous potassium chloride. Explain these experimental results.

(ii) Give evidence that $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$ and $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Cl}$ are ionisable isomers.

(iii) Why are low spin tetrahedral complexes not formed?

3(i) How many geometrical isomers are possible in the following coordination entities?

(a) $[\text{Cr}(\text{C}_2\text{O}_4)_3]^{3-}$ (b) $[\text{CoCl}_3(\text{NH}_3)_3]$ (c) $[\text{Pt}(\text{en})_2\text{Cl}_2]$

(ii). Using IUPAC norms, write the formulae for the following :

(a) Tetrahydroxozincate(II)

(b) Hexaammineplatinum (IV)

4(a) Explain with two examples each of the following: coordination entity, ligand, coordination number, coordination polyhedron, homoleptic and heteroleptic.

Draw the figure to show the splitting of d-orbital in an octahedral crystal field.

Calculate the spin only magnetic moment of the complex $[\text{FeF}_6]^{3-}$.

5(a) Explain the bonding in coordination compounds in terms of Werner's postulates.

What is meant by chelate effect? Give an example.

CHAPTER -6 (HALOALKANES AND HALOARENES)

(a) Write the formula of freon.

(b) Give two uses of chlorofluorocarbons.

(c) How does freon-12 deplete ozone layer?

(d) Do you think the use of CFCs should be banned? Give reason.

(a) What are ambident nucleophiles? Explain with an example.

(b) Write the structure of the major organic product for the reaction:



(c) n-butyl bromide has higher boiling point than tert.-butyl bromide?

(d) Butan-1-ol is optically inactive but Butan-2-ol is optically active.

(e) Benzyl chloride undergoes $\text{S}_\text{N}1$ reaction faster than cyclohexyl methyl chloride.

(a) Arrange each set of compounds in order of increasing boiling points

Bromomethane, bromoform, chloromethane, dibromomethane.

(b) Which of the compounds will react faster in $\text{S}_\text{N}1$ reaction with the OH^- ion?

$\text{CH}_3\text{—CH}_2\text{—Cl}$ or $\text{C}_6\text{H}_5\text{—CH}_2\text{—Cl}$

(c) Name the reaction: $\text{C}_6\text{H}_5\text{ONa} + \text{C}_2\text{H}_5\text{Cl} \rightarrow \text{C}_6\text{H}_5\text{—O—C}_2\text{H}_5$

(d) Complete the following analogy

Same molecular formula but different structures: A

Non super imposable mirror images: B

- (e) Why iodoform has appreciable antiseptic properties?
- (a) What is the direction of the polarity of a Carbon Halogen bond?
- (b) Fluorine is the most electronegative of the Halogens, yet Chloromethane has the largest dipole moment of the halomethanes. How is this possible?
- (c) Ethane and Bromomethane have widely different boiling points. Explain.
- (d) What is the stereochemistry of the S_N2 reaction?
- (e) What is the order of stability of carbocations?
- (a) How would you convert: (i) Benzene to Biphenyl (ii) Aniline to Chlorobenzene.
- (b) Arrange in order of property indicated:
 - (i) $CH_3CH_2CH_2CH_2Br$, $(CH_3)_3Br$, $(CH_3)_3CHCH_2Br$ (Increasing boiling point)
 - (ii) CH_3F , CH_3I , CH_3Cl , CH_3Br (nucleophilic substitution).
- (c) p-Dichlorobenzene has higher melting point and lower solubility than those of o- and m- isomers. Discuss.

CHAPTER -7 (ALCOHOLS ,PHENOLS AND ETHERS)

1. (a) Write the IUPAC names of the following compounds:

$CH_3 - C(CH_3)_2 CH(OH) CH_3$

$CH_3 CH=CH CH(Br) CH_2OH$

$CH_3 - O - CH C(CH_3)_3$

(b) Give simple chemical test to distinguish between the following pairs of compounds:

Ethanol and phenol

Propanol and 2-methyl propan-2-ol

2. (a) Arrange the following compounds in increasing order of acidic strength

p-nitrophenol, ethanol, phenol

(b) Arrange the following in increasing order of boiling point

Butanol, 2-methyl propanol, 2,2-dimethyl propanol, propanol

(c) Write the equations involved in following reactions:

Oxidation reaction of Phenol

Williamson synthesis

Friedel crafts alkylation of phenol

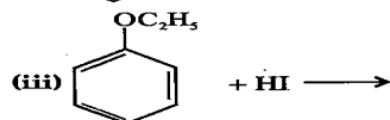
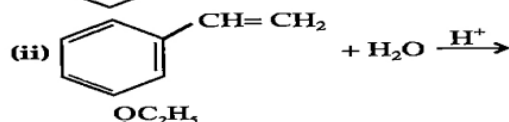
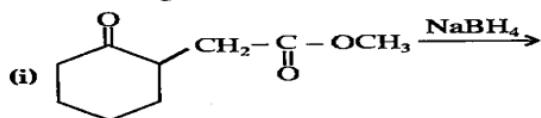
3. (a) Account for the following:

Alcohols are soluble in water as compared to hydrocarbons.

Which of the following is more volatile: o-nitrophenol, p-nitrophenol?

(b) Write Lucas test for primary, secondary and tertiary alcohol.

4. (a) Complete the following equations:



(b) Why phenol undergoes electrophilic substitution reactions?

5. (a) Predict the reagent for carrying out the following conversions:

Phenol to benzoquinone

Anisole to p-bromoanisole

Phenol to 2, 4, 6-tribromophenol

(b) Write equation for the following reactions:

(a) Kolbe's reaction (b) Reimer-Tiemann reaction

CHAPTER -8 (ALDEHYDES ,KETONES AND CARBOXYLIC ACIDS)

Which of the following compounds would undergo Aldol condensation, which the Cannizzaro reaction and which neither? Write the structures of the expected products of Aldol condensation and Cannizzaro reaction.

Methanal (b) 2-Methylpentanal © Benzaldehyde (d) Benzophenone (e) Cyclohexanone

(f) 1-Phenylpropanone (g) Phenylacetaldehyde (h) Butan-1-ol (i) 2,2-Dimethylbutanal.

Give reasons for the following :

$\text{C}_6\text{H}_5\text{COOH}$ is weaker than formic acid.

HCOOH and CH_3COOH are differentiated by Tollen's reagent.

$\text{R}-\text{COOH}$ do not give characteristic reaction of $>\text{C}=\text{O}$ (Carbonyl group)

Carboxylic acids are stronger acids than phenols.

Ethanoic acid does not show Cannizzaro reaction

(i) Arrange the following in the property indicated:

Acetaldehyde, Acetone, di-tert-butyl ketone, Methyl tert-butyl ketone in

(increasing reactivity towards HCN)

(b) $\text{CH}_3\text{CH}_2\text{CHBrCOOH}$, $\text{CH}_3\text{CHBrCH}_2\text{COOH}$, $(\text{CH}_3)_2\text{CHCOOH}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ (in increasing order of acid strength)

(ii) An aliphatic compound 'A' with a molecular formula of C_3H_6O reacts with phenylhydrazine to give compound 'B'. Reaction of 'A' with I_2 in alkaline medium on warming, gives yellow precipitate 'C'. Identify the compounds A,B and C.

What is meant by the following terms? Give an example in each case.

(i)Cyanohydrin (ii) Semicarbazone (iii) Schiff base (iv) Ketal (v)Oxime

PHYSICS:

Chapter 1: Ray Optics and Optical Instruments

1. Derive the lens maker's formula for a thin lens. Write the expression for the power of a lens and state its SI unit.
2. An object is placed 30 cm in front of a convex lens of focal length 20 cm. Calculate the image position, magnification and nature of the image using the lens formula.

Chapter 2: Wave Optics

3. State Huygens' principle. Using the wavefront construction, explain the laws of reflection of light.
4. In Young's double-slit experiment, derive the expression for the fringe width. What happens to the fringe width when the wavelength of light is increased or the distance between the slits is decreased?

Chapter 3: Dual Nature of Radiation and Matter

5. State Einstein's photoelectric equation. Explain the effect of frequency and intensity of incident light on the photoelectric current and stopping potential.
6. Define de Broglie wavelength. Derive the expression for the de Broglie wavelength of an electron accelerated through a potential difference V .

Chapter 4: Alternating Current

7. Derive the expression for the impedance of a series LCR circuit connected to an AC source. Define resonance and state the condition for resonance.
8. Define power factor in an AC circuit. Explain the significance of the power factor and derive the expression for average power consumed in an AC circuit.

Chapter 5: Electromagnetic Waves

9. What are electromagnetic waves? Explain their important properties and show the relationship between the speed of propagation, electric field and magnetic field.
10. Arrange the different regions of the electromagnetic spectrum in increasing order of frequency. Mention one important use of each of the following: radio waves, microwaves, infrared rays, ultraviolet rays, X-rays and gamma rays.

Submission: Complete all ten questions neatly, practise the derivations and revise the important formulae from all five chapters.

ARTIFICIAL INTELLIGENCE:

Chapter 2: Data Science Methodology

Long Answer Questions

1. What is Data Science Methodology and why is it important?
2. Explain the steps involved in Data Science Methodology.
3. What are the different types of analytics, and how do they differ from each other?
4. What is Feature Engineering and why is it crucial for machine learning models?
5. Describe the differences between structured, semi-structured, and unstructured data. Provide examples of each.
6. What is the importance of the "Evaluation" phase in the Data Science Methodology?
7. Explain the concept of K-Fold Cross-Validation and its advantages over simple train-test split.
8. What are the different evaluation metrics used for classification models?
9. What is the role of "Business Understanding" in Data Science?
10. Explain the differences between "Descriptive Modelling" and "Predictive Modelling."
11. How does Data Preparation impact the performance of machine learning models?
12. What are some common challenges faced in the "Data Collection" phase of Data Science?
13. Why is "Model Validation" important, and what techniques are commonly used?
14. What are the key considerations when deploying a machine learning model in a real-world scenario?
15. What is "Feedback" in Data Science Methodology, and why is it important?

Chapter 3: Computer Vision

Short Answer Questions

1. Define Computer Vision. How is it related to Artificial Intelligence?
2. What is a digital image and how is it stored in a computer?
3. How does image resolution affect the quality of an image?
4. Differentiate between image classification and object detection with an example.
5. Name two algorithms used for object detection and mention one use case.
6. What is image pre-processing and why is it necessary in computer vision?
7. Which feature extraction method highlights object boundaries in an image and why is it important?
8. How does histogram equalization improve image quality?
9. Write any two real-life applications of Computer Vision.
10. Distinguish between semantic segmentation and instance segmentation with examples.
11. What is image acquisition? Mention one factor that affects its quality.
12. Which supervised learning algorithm is used for image classification and why?
13. Why do lighting variations create challenges in computer vision?

14. Why does computer vision raise privacy concern in surveillance systems?
15. What is high-level processing in computer vision and where is it applied?
16. What problem is posed by duplicate and false content in computer vision?
17. How do single-object detection tasks differ from multi-object detection tasks?
18. Why are Convolutional Neural Networks (CNNs) preferred for feature extraction?
19. Which computer vision application can help urban planners create detailed city models?
20. How does image resolution affect printed photographs in a student project?

Long Answer Questions (4 Marks Each)

1. Explain the stages of the Computer Vision process with suitable examples.
2. What is image segmentation? Explain semantic and instance segmentation with examples.
3. Describe four real-world applications of Computer Vision.
4. What are the main challenges faced by Computer Vision systems?
5. Differentiate between classification, detection, and localization tasks in Computer Vision with examples.
6. Explain how pre-processing techniques improve Computer Vision models.
7. How does high-level processing in Computer Vision help in decision-making?
8. Explain why convolutional neural networks (CNNs) are widely used in Computer Vision.
9. How can Computer Vision be used to build detailed 3D city models?
10. Discuss the ethical concerns related to Computer Vision applications.

Chapter 4: Big Data Analytics

Theory Questions

1. What is Big Data, and how does it differ from small data?
2. Explain the 3V's of Big Data and their significance.
3. What are the main types of Big Data, and how do they differ from each other?
4. Describe the advantages and disadvantages of using Big Data.
5. What are the 6V's of Big Data, and how do they provide a more holistic view of Big Data?
6. What is the role of Hadoop in Big Data processing?
7. Explain the differences between structured, semi-structured, and unstructured data.
8. What is Data Mining, and how does it apply to Big Data?
9. How does Big Data Analytics work, and what are its key components?
10. What are some common types of Big Data Analytics?
11. What is Data Stream Mining, and how is it used?
12. What challenges are associated with the "Veracity" of Big Data?
13. How can Big Data be used in the healthcare industry?
14. What is the significance of "Cloud Computing" in Big Data Analytics?

15. How do the “Volume” and “Velocity” aspects of Big Data affect the analysis process?
16. What role do Machine Learning algorithms play in Big Data analytics?
17. How does “Batch Processing” differ from “Stream Processing” in Big Data analytics?
18. What are the ethical concerns associated with Big Data?
19. What tools are commonly used in Big Data analytics, and how do they help?
20. What are the future trends in Big Data Analytics?

Chapter 5: Neural Networks

Short Answer Type Questions

1. What is a neural network, and how does it work?
2. Explain the importance of activation functions in neural networks.
3. What are the key components of a neural network?
4. Explain the difference between a feedforward neural network and a recurrent neural network.
5. How does backpropagation work in training a neural network?
6. What are convolutional neural networks (CNNs), and why are they used in image processing?
7. What are generative adversarial networks (GANs), and how do they work?
8. What are some common challenges in training deep neural networks?
9. What is the significance of the learning rate in neural networks?
10. How do neural networks handle non-linearity?
11. What is dropout, and why is it used in neural networks?
12. How do Recurrent Neural Networks (RNNs) process sequential data?
13. How does batch normalization improve neural network training?
14. What is transfer learning, and why is it useful?
15. What is the role of pooling layers in CNNs?

Chapter 6: Generative AI

Short Answer Questions

1. What is Generative AI, and how does it work?
2. How do Generative AI models differ from Discriminative AI models?
3. What are Generative Adversarial Networks (GANs) and how do they function?
4. What is a Variational Autoencoder (VAE), and how is it used in Generative AI?
5. What are Large Language Models (LLMs), and how do they contribute to Generative AI?
6. How do transformers improve the performance of Large Language Models (LLMs)?
7. What are some real-world applications of Generative AI?
8. What are deepfakes, and why are they considered a major ethical concern?
9. How can biases in Generative AI models be addressed?
10. What is the Gemini API, and how can it be used to create AI-powered chatbots?
11. What are some limitations of Generative AI?
12. What are the risks associated with Large Language Models (LLMs)?
13. What ethical considerations should be made when using Generative AI in content creation?
14. How is Generative AI used in personalized marketing and advertising?

How can AI-generated media be identified and prevented from spreading misinformation

COMPUTER SCIENCE:

Part A · File Handling

A1. Objective Questions (1 Mark each)

Assertion–Reason options (used wherever "A–R" is mentioned)

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

FH-01 1 Mark*Paper 1 · Q.16*

_____ files are stored in a computer in a sequence of bytes.

- (A) Text (B) Binary
(C) CSV (D) Notepad

FH-02 1 Mark*Paper 1 · Q.18***Assertion–Reason.**

- (A) **Assertion (A):** If numeric data are to be written to a text file, the data needs to be converted into a string before writing to the file.
(R) **Reason (R):** write() method takes a string as an argument and writes it to the text file.

FH-03 1 Mark*Paper 2 · Q.6*

Which of the following modes in Python creates a new file, if file does not exist and overwrites the content, if the file exists?

- (a) r+ (b) r
(c) w (d) a

FH-04 1 Mark*Paper 2 · Q.11*

The correct syntax of tell() is:

- (a) tell.file_object() (b) file_object.tell()
(c) tell.file_object(1) (d) file_object.tell(1)

FH-05 1 Mark*Paper 2 · Q.18***Assertion–Reason.**

- (A) **Assertion (A):** readlines() reads all the lines from a text file and returns the lines along with newline as a list of strings.
(R) **Reason (R):** readline() can read the entire text file line by line without using any looping statements.

FH-06 1 Mark*Paper 3 · Q.6*

Which of the following mode keeps the file offset position at the end of the file?

- (a) r+ (b) r
- (c) w (d) a

FH-07 1 Mark*Paper 3 · Q.11*

The syntax of seek() is: file_object.seek(offset[,reference_point]). What is the default value of reference_point?

- (a) 0 (b) 1
- (c) 2 (d) 3

FH-08 1 Mark*Paper 4 · Q.10*

A text file song.txt contains the following contents in it: **Life goes on as it never ends**. What will be the output of the following code snippet?

```
f1=open("song.txt","r")
s1=f1.read(5)
s2=f1.readline(4)
s3=f1.read(3)
print(s1,s3,sep="#")
```

- (A) goes# on (B) Life #goes# on
- (C) Life # on (D) Error

FH-09 1 Mark*Paper 5 · Q.10*

Consider the statement given below:

```
f1 = open("pqr.dat","_____")
```

Which of the following is the correct file mode to open the file in read only mode?

- (A) a (B) rb
- (C) r+ (D) rb+

FH-10 1 Mark*Paper 6 · Q.20*

Assertion–Reason.

(A) Assertion (A): For a binary file opened using 'rb' mode, the pickle.dump() method will display an error.

(R) Reason (R): The pickle.dump() method is used to read from a binary file.

[A2. Text File – Programming Questions \(3 Marks each\)](#)

FH-11 3 Marks*Paper 1 · Q.28*

(a) Write a method/function COUNTWORDS() in Python to read contents from a text file DECODE.TXT, to count and return the occurrence of those words, which are having 5 or more characters.

— OR —

- (b) Write a method/function COUNTLINES() in Python to read lines from a text file CONTENT.TXT, and display those lines, which have @ anywhere in the line.

For example, if the content of the file is:

Had an amazing time at the concert last night with @MusicLoversCrew.

Excited to announce the launch of our new website!

G20 @ India

The method/function should display:

Had an amazing time at the concert last night with @MusicLoversCrew.

G20 @ India

FH-12 3 Marks

Paper 2 · Q.27

- (a) Write a function in Python that displays the book names having 'Y' or 'y' in their name from a text file "Bookname.txt".

Example: if the file contains the names of the following books:

One Hundred Years of Solitude

The Diary of a Young Girl

On the Road

After execution, the output will be:

One Hundred Years of Solitude

The Diary of a Young Girl

— OR —

- (b) Write a function RevString() to read a text file "Input.txt" and print the words starting with 'O' in reverse order. The rest of the content is displayed normally.

Example: if the content of the text file is:

UBUNTU IS AN OPEN SOURCE OPERATING SYSTEM

Output will be (words 'OPEN' and 'OPERATING' are displayed in reverse order):

UBUNTU IS AN NEPO SOURCE GNITAREPO SYSTEM

FH-13 3 Marks

Paper 3 · Q.27

- (a) Write the definition of a Python function named LongLines() which reads the contents of a text file named 'LINES.TXT' and displays those lines from the file which have **at least 10 words** in it.

For example, if the content of 'LINES.TXT' is as follows:

Once upon a time, there was a woodcutter

He lived in a little house in a beautiful, green wood.

One day, he was merrily chopping some wood.

He saw a little girl skipping through the woods, whistling happily.

The girl was followed by a big gray wolf.

Then the function should display the output as:

He lived in a little house in a beautiful, green wood.

He saw a little girl skipping through the woods, whistling happily.

— OR —

- (b) Write a function `count_Dwords()` in Python to count the words **ending with a digit** in a text file "Details.txt".

Example: if the file content is as follows:

On seat2 VIP1 will sit and

On seat1 VVIP2 will be sitting

Output will be:

Number of words ending with a digit are 4

FH-14 3 Marks

Paper 4 · Q.29

- (a) Write a Python function that displays all the lines ending with a dot (.) from a text file "Colors.txt".

For example, if the file contains:

White is a mix of seven colors.

What are these seven colors ?

VIBGYOR – violet, indigo, blue, green, orange and red.

When we mix all these colors we just get one light

which is the WHITE light.

Then the output should be:

White is a mix of seven colors.

VIBGYOR – violet, indigo, blue, green, orange and red.

which is the WHITE light.

Hint: You will have to ignore trailing white spaces to check the last character.

— OR —

- (b) Write a function in Python to display the line which has the **maximum number of vowels** from a text file "Novel.txt".

FH-15 3 Marks

Paper 5 · Q.29

Consider a text file "Space.txt" containing:

Contents of Space.txt

Space exploration has unlocked incredible advancements in technology and science. Since the first moon landing in 1969, space agencies have sent probes to Mars, Jupiter and beyond. The ISS, orbiting Earth at about 400 km, serves as a hub for research. With missions planned for 2030, humanity's cosmic journey continues!

- (a) Write a Python function that counts and returns the number of **digits** appearing in the text file "Space.txt". For the file above, the function should return 11.

— OR —

- (b) Write a Python function that displays the words in which the lowercase letter 'e' appears **at least twice** in the text file 'Space.txt'. For the file above, the function should display:

Output

incredible advancements science. agencies serves research.

FH-16 3 Marks

Paper 6 · Q.29

- (a) Write a Python function that displays all the lines containing the word 'vote' from a text file "Elections.txt".

For example, if the file contains:

In an election many people vote to choose their representative.

The candidate getting the maximum share of votes stands elected.

Normally, one person has to vote once.

The process of voting may vary with time and region.

Then the output should be:

In an election many people vote to choose their representative.

Normally, one person has to vote once.

— OR —

- (b) Write a Python function that displays all the words **starting and ending with a vowel** from a text file "Report.txt". The consecutive words should be separated by a space in the output.

For example, if the file contains:

Once there was a wise man in a village.

He was an awesome story-teller.

He was able to keep people anchored while listening to him.

Then the output should be:

Once a a awesome able

A3. Binary File – Programming and Fill-in-the-Code Questions

FH-17 5 Marks

Paper 1 · Q.34

- (a) (i) What is the main purpose of seek() and tell() methods?
(ii) Consider a binary file, Cinema.dat containing information in the following structure: [Mno, Mname, Mtype]. Write a function search_copy() that reads the content from the file Cinema.dat and copies all the details of the **"Comedy"** movie type to a file named movie.dat.

— OR —

- (b) (i) Give one difference between write() and writeline() function in text file.
(ii) A binary file "Items.dat" has the structure [Icode, Description, Price], where Icode – Item code, Description – Detail of item, Price – Price of item. Write a function Add_data() that takes Icode, Description and Price from the user and writes the information in the binary file "Items.dat".

Atharva is a programmer, who has recently been given a task to write a Python code to perform the following binary file operation with the help of a user defined function/module:

Copy_new() : to create a binary file new_items.dat and write all the item details stored in the binary file items.dat, except for the item whose item_id is 101. The data is stored in the following format: {item_id:[item_name,amount]}

```
import _____ # Statement 1

def Copy_new():

    f1= _____ # Statement 2

    f2= _____ # Statement 3

    item_id=int(input("Enter the item id"))

    item_detail= _____ # Statement 4

    for key in item_detail:

        if _____: # Statement 5

            pickle. _____ # Statement 6

    f1.close()

    f2.close()
```

He has succeeded in writing partial code and has missed out certain statements. Help him to complete the code:

- (i) Which module should be imported in the program? (Statement 1) **[1]**
- (ii) Write the correct statement required to open the binary file "items.dat". (Statement 2) **[1]**
- (iii) Which statement should Atharva fill in Statement 3 to open the binary file "new_items.dat" and in Statement 4 to read all the details from the binary file "items.dat". **[2]**

— OR —

- (iii) What should Atharva write in Statement 5 to apply the given condition and in Statement 6 to write data in the binary file "new_items.dat". **[2]**

Shreyas is a programmer, who has recently been given a task to write a user defined function named `write_bin()` to create a binary file called `Cust_file.dat` containing customer information – customer number (`c_no`), name (`c_name`), quantity (`qty`), price (`price`) and amount (`amt`) of each customer.

The function accepts customer number, name, quantity and price. Thereafter, it displays the message 'Quantity less than 10..... Cannot SAVE', if quantity entered is less than 10. Otherwise the function calculates amount as `price * quantity` and then writes the record in the form of a list into the binary file.

```
import pickle
def write_bin():
    bin_file=_____ #Statement 1
    while True:
        c_no=int(input("enter customer number"))
        c_name=input("enter customer name")
        qty=int(input("enter qty"))
        price=int(input("enter price"))
        if _____ #Statement 2
            print("Quantity less than 10..Cannot SAVE")
        else:
            amt=price * qty
            c_detail=[c_no,c_name,qty,price,amt]
            _____ #Statement 3
            ans=input("Do you wish to enter more records y/n")
            if ans.lower()=='n':
                _____ #Statement 4
                _____ #Statement 5
                _____ #Statement 6
```

- (i) Write the correct statement to open a file '`Cust_file.dat`' for writing the data of the customer. [1]
- (ii) Which statement should Shreyas fill in Statement 2 to check whether quantity is less than 10. [1]

- (iii) Which statement should Shreyas fill in Statement 3 to write data to the binary file and in Statement 4 to stop further processing if the user does not wish to enter more records. [2]

— OR —

- (iii) What should Shreyas fill in Statement 5 to close the binary file named Cust_file.dat and in Statement 6 to call a function to write data in binary file? [2]

FH-20 5 Marks

Paper 4 · Q.36

Keshav is the IT Head in a hospital. He needs to manage the records of all the doctors in the hospital. For this, he wants to store the following information of each doctor in a file:

Field	Meaning
D_ID	An integer to store Doctor ID
D_Name	A string to store doctor's name
D_Dept	A string to store the Department of the doctor (Surgery, Radiology, etc.)
Experience	An integer to store doctor's experience (in years)

For example, a doctor's information may be: [1256, 'R. Gupta', 'Cardiology', 15]

As an applicant for the post of a Programmer, you have to answer the following questions in this context:

- (I) Write one difference of storing this data in a binary file over a CSV file. [1]
- (II) Assume that the data is stored in a binary file, named DOCTORS.DAT, and each record is stored as a list. Write a function, in Python, to read and display all the records from the file DOCTORS.DAT. [2]
- (III) Write a function addDoctor(), in Python, which accepts a doctor's data from the user and writes it in the file DOCTORS.DAT. [2]

FH-21 5 Marks

Paper 5 · Q.36

NextStep is an organization which has a pool of resource persons to conduct training workshops on various topics related to ICT. The data of all its Resource Persons is stored in a binary file RESOURCES.DAT using the following record structure (each record is a tuple): (R_ID, R_Name, R_Expertise, Charges)

Field	Meaning
R_ID	Resource Person's ID (an integer)
R_Name	Resource Person's Name (a string)
R_Expertise	Area of expertise of the Resource Person

Field	Meaning
Charges	Charges (in rupees) per hour to conduct a workshop

For example, a record in the file is: (12, 'P. Velusami', 'Machine Learning', 5000)

In this context, write the following user defined functions in Python:

- (i) Append() – To input the data of a Resource Person and write it in the file RESOURCES.DAT. [2]
- (ii) Update() – To increase the Charges of each resource person by 500. [3]

FH-22 5 Marks

Paper 6 · Q.36

A file, PASSENGERS.DAT, stores the records of passengers using the following structure: [PNR, PName, BRDSTN, DESTN, FARE]

Field	Meaning
PNR	Passenger Number (string type)
PName	Passenger Name (string type)
BRDSTN	Boarding Station Name (string type)
DESTN	Destination Station Name (string type)
FARE	Fare amount for the journey (float type)

Write user defined functions in Python for the following tasks:

- (i) Create() – to input data for passengers and write it in the binary file PASSENGERS.DAT.
- (ii) SearchDestn(D) – to read contents from the file PASSENGERS.DAT and display the details of those Passengers whose DESTN matches with the value of D.
- (iii) UpdateFare() – to increase the fare of all passengers by 5% and rewrite the updated records into the file PASSENGERS.DAT.

A4. CSV File – Programming Questions

FH-23 4 Marks

Paper 1 · Q.32

Mr. Mahesh is a Python Programmer working in a school. He has to maintain the records of the sports students. He has created a csv file named sports.csv, to store the details. The structure of sports.csv is: [sport_id, competition, prize_won] where sport_id is Sport id (integer), competition is competition name (string), prize_won is ("Gold", "Silver", "Bronze").

Mr. Mahesh wants to write the following user-defined functions:

- Add_detail() : to accept the detail of a student and add to a csv file, "sports.csv".
- Count_Medal() : to display the name of competitions in which students have won "Gold" medal.

Help him in writing the code of both the functions.

- (a) Write a point of difference between append (a) and write (w) modes in a text file. Write a program in Python that defines and calls the following user defined functions:
- (i) Add_Teacher() : It accepts the values from the user and inserts record of a teacher to a csv file 'Teacher.csv'. Each record consists of a list with field elements as T_id, Tname and design to store teacher ID, teacher name and designation respectively.
 - (ii) Search_Teacher() : To display the records of all the PGT (designation) teachers.

— OR —

- (b) Write one point of difference between seek() and tell() functions in file handling. Write a program in Python that defines and calls the following user defined functions:
- (i) Add_Device() : The function accepts and adds records of the peripheral devices to a csv file 'peripheral.csv'. Each record consists of a list with field elements as P_id, P_name and Price to store peripheral device ID, device name, and price respectively.
 - (ii) Count_Device() : To count and display number of peripheral devices, whose price is less than ₹ 1000.

- (a) Write one difference between CSV and text files. Write a program in Python that defines and calls the following user defined functions:
- (i) COURIER_ADD() : It takes the values from the user and adds the details to a csv file 'courier.csv'. Each record consists of a list with field elements as cid, s_name, Source, destination to store Courier ID, Sender name, Source and destination address respectively.
 - (ii) COURIER_SEARCH() : Takes the destination as the input and displays all the courier records going to that destination.

— OR —

- (b) Why is it important to close a file before exiting? Write a program in Python that defines and calls the following user defined functions:
- (i) Add_Book() : Takes the details of the books and adds them to a csv file 'Book.csv'. Each record consists of a list with field elements as book_ID, B_name and pub to store book ID, book name and publisher respectively.
 - (ii) Search_Book() : Takes publisher name as input and counts and displays number of books published by them.

Suman is an intern at a software startup. The company has assigned her a task to create a CSV file named CLUB.CSV, to store the records of the Club members. After discussing with Club Incharge, Suman has planned to store the following content of members in the file CLUB.CSV: [Mno, Name, Mobile, Fee] where Mno – Member Number, Name – Name of the Member, Mobile – Member's Mobile Number, Fee – Fee amount.

Assuming you are asked to help Suman in her assignment, write a Python code for performing the following tasks with the help of user-defined functions:

- NewMembers() : to accept records of members from the user and add them to the file CLUB.CSV.
- PriorityMember() : to find and display those members from the file CLUB.CSV, who are paying Fee more than 35000.

A csv file "States.csv" contains some data about all the states of India. Each record of the file contains the following data:

- Name of the State
- Capital of the State
- Population of the State
- Official Language of the State

For example, a sample record in the file is: ['Andhra Pradesh','Amaravati',52221000,'Telugu']

Write a Python program which reads the data from this file and **appends all those records where population is more than 10000000** into another csv file 'More.csv'.

Note: "States.csv" also contains the Header row. The Header row should NOT be copied to "More.csv".

A csv file "P_record.csv" contains the records of patients in a hospital. Each record of the file contains the following data: Name of a patient; Disease; Number of days patient is admitted; Amount.

For example, a sample record of the file may be: ["Gunjan","Jaundice",4,15000]

Write the following Python functions to perform the specified operations on this file:

- (i) Write a function `read_data()` which reads all the data from the file and displays the details of all the **'Cancer'** patients.
- (ii) Write a function `count_rec()` which counts and returns the number of records in the file.

B1. Objective Questions (1 Mark each)

Assertion–Reason options

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.

ST-01 1 Mark

Paper 2 · Q.17

Assertion–Reason.

- (A) **Assertion (A):** In Python, a stack can be implemented using a list.
 (R) **Reason (R):** A stack is an ordered linear list of elements that works on the principle of First In First Out (FIFO).

ST-02 1 Mark

Paper 3 · Q.18

Assertion–Reason.

- (A) **Assertion (A):** A stack is a LIFO structure.
 (R) **Reason (R):** Any new element pushed into the stack always gets positioned at the index after the last existing element in the stack.

B2. Stack Programming Questions (3 Marks each)

ST-03 3 Marks

Paper 1 · Q.30

A dictionary, `d_city` contains the records in the following format: `{state:city}`

Define the following functions with the given specifications:

- (i) `push_city(d_city)` : It takes the dictionary as an argument and pushes all the cities in the stack CITY whose states are of **more than 4 characters**.
 (ii) `pop_city()` : This function pops the cities and displays "**Stack empty**" when there are no more cities in the stack.

ST-04 3 Marks

Paper 2 · Q.30

A list contains the following record of course details for a University: `[Course_name, Fees, Duration]`

Write the following user defined functions to perform given operations on the stack named 'Univ':

- (i) `Push_element()` – To push an object containing the `Course_name`, `Fees` and `Duration` of a course, which has fees **greater than 100000**, to the stack.
 (ii) `Pop_element()` – To pop the object from the stack and display it. Also, display "**Underflow**" when there is no element in the stack.

For example, if the lists of course details are:

```
["MCA", 200000, 3]
```

```
["MBA",500000,2]
```

```
["BA",100000,3]
```

The stack should contain:

```
["MBA",500000,2]
```

```
["MCA",200000,3]
```

ST-05 3 Marks

Paper 3 · Q.30

- (a) A list contains the following record of a customer: [Customer_name, Room Type]. Write the following user defined functions to perform given operations on the stack named 'Hotel':
- (i) Push_Cust() – To push the names of those customers who are staying in '**Delux**' Room Type.
 - (ii) Pop_Cust() – To pop the names of customers from the stack and display them. Also, display "**Underflow**" when there are no customers in the stack.

For example, if the lists with customer details are as follows:

```
["Siddharth", "Delux"]
```

```
["Rahul", "Standard"]
```

```
["Jerry", "Delux"]
```

The stack should contain: Jerry, Siddharth

The output should be:

Jerry

Siddharth

Underflow

— OR —

- (b) Write a function in Python, Push(Vehicle) where Vehicle is a dictionary containing details of vehicles – {Car_Name: Maker}. The function should push the name of car manufactured by '**TATA**' (including all the possible cases like Tata, TaTa, etc.) to the stack.

For example, if the dictionary contains the following data:

```
Vehicle={"Santro":"Hyundai","Nexon":"TATA","Safari":"Tata"}
```

The stack should contain:

```
Safari
```

```
Nexon
```

ST-06 3 Marks

Paper 4 · Q.30

- (a) A stack named KeyStack contains records of some computer keyboards. Each record is represented as a list containing **Make, Keys, Connectivity**. The Make and Connectivity are strings, and Keys is an integer. For example, a record in the stack may be ('Hitech', 105, 'USB'). Write the following user-defined functions in Python to perform the specified operations on KeyStack:
- (I) push_key(KeyStack, new_key) : This function takes the stack KeyStack and a new record new_key as arguments and pushes this new record onto the stack.
 - (II) pop_key(KeyStack) : This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message "**Underflow**".

(III) isEmpty(KeyStack) : This function checks whether the stack is empty. If the stack is empty, the function should return True, otherwise the function should return False.

— OR —

(b) Write the following user-defined functions in Python:

- (I) push_vowels(S,St) : Here S is a string and St is a list representing a stack. The function should push all the vowels of the string S onto the stack St. For example, if the string S is "Easy Concepts", then the function push_vowels() should push the elements 'E','a','o','e' onto the stack.
- (II) pop_one(St) : The function should pop an element from the stack St, and return this element. If the stack is empty, then the function should display the message '**Stack Underflow**', and return None.
- (III) display_all(St) : The function should display all the elements of the stack St, without deleting them. If the stack is empty, the function should display the message '**Empty Stack**'.

ST-07 3 Marks

Paper 5 · Q.30

(a) A stack named FruitStack, implemented using list, contains records of some fruits. Each record is represented as a dictionary with keys 'Name', 'Origin', 'Price', and 'Expiry'. A sample record is given here:

| {'Name':'Apple','Origin':'France','Price':120,'Expiry':'12-08-2025'}

Write the following user-defined functions in Python to perform the specified operations on FruitStack:

- (i) push_fruit(FruitStack, Fruit) : This function takes the stack FruitStack and a new record Fruit as arguments and pushes the record stored in Fruit onto FruitStack **if the Price is less than 100**.
- (ii) pop_fruit(FruitStack) : This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display "**UNDERFLOW**".
- (iii) display(FruitStack) : This function displays all the elements of the stack starting from the topmost element. If the stack is empty, the function should display '**EMPTY STACK**'.

— OR —

(b) Write a Python program to accept 10 integers from the user. If the entered number is a **three-digit even integer**, push it onto a stack. After all inputs are taken, pop all the three-digit even integers from the stack and display them.

For example, if the user enters 12, 31, 320, 457, 6, 92, 924, 220, 1, 218, then the stack should contain:

| 320, 924, 220, 218

and the output of the program should be:

| 218 220 924 320

ST-08 3 Marks

Paper 6 · Q.30

(a) A stack, named ClrStack, contains records of some colors. Each record is represented as a tuple containing four elements – ColorName, RED, GREEN, BLUE. ColorName is a string, and RED,

GREEN, BLUE are integers. For example, a record in the stack may be ('Yellow', 237, 250, 68).

Write the following user-defined functions in Python to perform the specified operations on ClrStack:

- (i) `push_Clr(ClrStack, new_Clr)` : This function takes the stack ClrStack and a new record new_Clr as arguments and pushes this new record onto the stack.
- (ii) `pop_Clr(ClrStack)` : This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message "**Underflow**".
- (iii) `isEmpty(ClrStack)` : This function checks whether the stack is empty. If the stack is empty, the function should return True, otherwise the function should return False.

— OR —

(b) Write the following user-defined functions in Python:

- (i) `push_trail(N, myStack)` : Here N and myStack are lists, and myStack represents a stack. The function should push the **last 5 elements** from the list N onto the stack myStack. For example, if the list N is [1,2,3,4,5,6,7], then the function `push_trail()` should push the elements 3,4,5,6,7 onto the stack. Therefore the value of stack will be [3,4,5,6,7]. Assume that N contains at least 5 elements.
- (ii) `pop_one(myStack)` : The function should pop an element from the stack myStack, and return this element. If the stack is empty, then the function should display the message '**Stack Underflow**', and return None.
- (iii) `display_all(myStack)` : The function should display all the elements of the stack myStack, without deleting them. If the stack is empty, the function should display the message '**Empty Stack**'.

C1. Objective Questions (1 Mark each)

CN-01 1 Mark*Paper 1 · Q.6*

'L' in HTML stands for:

- | | |
|-----------|--------------|
| (A) Large | (B) Language |
| (C) Long | (D) Laser |

CN-02 1 Mark*Paper 1 · Q.11*

Ethernet card is also known as:

- | | |
|---------|---------|
| (A) LIC | (B) MIC |
| (C) NIC | (D) OIC |

CN-03 1 Mark*Paper 1 · Q.15*

Fill in the blank: The full form of WWW is _____.

CN-04 1 Mark*Paper 2 · Q.13*

Fill in the blank: In _____ switching, before a communication starts, a dedicated path is identified between the sender and the receiver.

- | | |
|-------------|-----------|
| (a) Packet | (b) Graph |
| (c) Circuit | (d) Plot |

CN-05 1 Mark*Paper 3 · Q.13*

Fill in the blank: _____ is used for point-to-point communication or unicast communication such as radar and satellite.

- | | |
|--------------------|----------------|
| (a) INFRARED WAVES | (b) BLUETOOTH |
| (c) MICROWAVES | (d) RADIOWAVES |

CN-06 1 Mark*Paper 4 · Q.17*

Which of the following devices is essential to set up a wired LAN?

- | | |
|--------------|--------------|
| (A) Modem | (B) NIC |
| (C) Repeater | (D) Firewall |

CN-07 1 Mark*Paper 4 · Q.18*

Which network device serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through it?

- | | |
|------------|--------------|
| (A) Modem | (B) Gateway |
| (C) Switch | (D) Repeater |

CN-08 1 Mark*Paper 4 · Q.19*

Which of the following IP addresses is valid?

- | | |
|-----------------------|---------------------|
| (A) 122.94.96.212 | (B) 212.254.258.210 |
| (C) 210.10.12.156.209 | (D) 122.294.56.68 |

Paper 5 · Q.17

With respect to computer networks, which of the following is the correct expanded form of RJ 45?

- (A) Radio Jockey 45 (B) Registered Jockey 45
(C) Radio Jack 45 (D) Registered Jack 45

Paper 5 · Q.18

Which network device serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through it in order to use routing paths?

- (A) Modem
(B) Gateway
(C) Switch
(D) Repeater

Paper 5 · Q.19

Expand the term XML.

Paper 6 · Q.17

Which of the following networking devices is used to regenerate and transmit the weakened signal ahead?

- (A) Hub
(B) Ethernet Card
(C) Repeater
(D) Modem

Paper 6 · Q.18

Which of the following options is the correct protocol used for phone calls over the internet?

- (A) PPP (B) FTP
(C) HTTP (D) VoIP

Paper 6 · Q.19

Expand ARPANET.

C2. Short Answer Questions (2 Marks each)

Paper 1 · Q.19

(a) (i) Expand the following terms: **URL, XML**. (ii) Give one difference between HTTP and FTP. **[1+1]**

— OR —

(b) (i) Define the term IP address with respect to network. (ii) What is the main purpose of a Router?
[1+1]

Paper 2 · Q.20

(a) Write any two differences between Fiber-optic cable and Coaxial cable.

— OR —

(b) Write one advantage and one disadvantage of wired over wireless communication.

Paper 2 · Q.23

(a) Write the full forms of the following: (i) XML (ii) HTTPS [1]

(b) What is the use of FTP? **[1]**

CN-18 2 Marks

Paper 3 · Q.20

(a) Differentiate between wired and wireless transmission.

— OR —

(b) Differentiate between URL and domain name with the help of an appropriate example.

CN-19 2 Marks

Paper 3 · Q.23

(a) Write the full forms of the following: (i) HTML (ii) TCP

(b) What is the need of Protocols?

CN-20 2 Marks

Paper 4 · Q.28

(I) (a) Expand the following terms: **POP, TCP**. (b) Write any one difference between a hub and a switch used in computer networks.

— OR —

(II) (a) Write any one difference between HTTP and HTTPS. (b) Write names of any two wireless transmission media.

CN-21 2 Marks

Paper 5 · Q.28

(a) List one advantage and one disadvantage of Bus topology.

— OR —

(b) What is a protocol in the context of computer networks? Which protocol is used to transmit hypertext across the web?

CN-22 2 Marks

Paper 6 · Q.28

(a) Expand and explain the term URL.

— OR —

(b) Expand the term PPP. What is the use of PPP?

C3. Case-Based Network Design Questions (5 Marks each)

CN-23 5 Marks

Paper 1 · Q.33

Logistic Technologies Ltd. is a Delhi based organization which is expanding its office set-up to Ambala. At the Ambala office campus, they are planning to have 3 different blocks for HR, Accounts and Logistics related work. Each block has a number of computers, which are required to be connected to a network for communication, data and resource sharing. As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised in (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.

From	To	Distance
HR Block	Accounts Block	400 m
Accounts Block	Logistics Block	200 m

From	To	Distance
Logistics Block	HR Block	150 m
Delhi Head Office	Ambala Office	220 km

Block	Number of computers
HR Block	70
Accounts Block	40
Logistics Block	30

- (i) Suggest the most appropriate block/location to house the SERVER in the Ambala office. Justify your answer.
- (ii) Suggest the best wired medium to efficiently connect various blocks within the Ambala office compound.
- (iii) Draw an ideal cable layout (Block to Block) for connecting these blocks for wired connectivity.
- (iv) The company wants to schedule an online conference between the managers of Delhi and Ambala offices. Which protocol will be used for effective voice communication over the Internet?
- (v) Which kind of network will it be between Delhi office and Ambala office?

CN-24 5 Marks

Paper 2 · Q.31

ABC Consultants are setting up a secure network for their office campus at Noida for their day-to-day office and web-based activities. They are planning to have connectivity between three buildings and the head office situated in Bengaluru. As a network consultant, give solutions to the questions (i) to (v), after going through the building locations and other details which are given below:

From	To	Distance
Building 1	Building 3	120 m
Building 1	Building 2	50 m
Building 2	Building 3	65 m
Noida Branch	Head Office (Bengaluru)	1500 km

Building	Number of computers
Building 1	25

Building	Number of computers
Building 2	51
Building 3	150
Head Office	10

- (i) Suggest the most suitable place to install the server for this organization. Also, give reason to justify your suggested location. **[1]**
- (ii) Suggest the cable layout of connections between the buildings inside the campus. **[1]**
- (iii) Suggest the placement of the following devices with justification: **Switch, Repeater**. **[1]**
- (iv) The organization is planning to provide a high-speed link with the head office situated in Bengaluru, using a wired connection. Suggest a suitable wired medium for the same. **[1]**
- (v) The System Administrator does remote login to any PC, if any requirement arises. Name the protocol, which is used for the same. **[1]**

CN-25 5 Marks

Paper 3 · Q.31

Quickdev, an IT based firm, located in Delhi is planning to set up a network for its four branches within a city with its Marketing department in Kanpur. As a network professional, give solutions to the questions (i) to (v), after going through the branches locations and other details which are given below:

From	To	Distance
Branch A	Branch B	40 m
Branch A	Branch C	80 m
Branch A	Branch D	65 m
Branch B	Branch C	30 m
Branch B	Branch D	35 m
Branch C	Branch D	15 m
Delhi Branch	Kanpur (Marketing Dept.)	300 km

Branch	Number of computers
Branch A	15
Branch B	25

Branch	Number of computers
Branch C	40
Branch D	115

- (i) Suggest the most suitable place to install the server for the Delhi branch with a suitable reason. [1]
- (ii) Suggest an ideal layout for connecting all these branches within Delhi. [1]
- (iii) Which device will you suggest, that should be placed in each of these branches to efficiently connect all the computers within these branches? [1]
- (iv) Delhi firm is planning to connect to its Marketing department in Kanpur which is approximately 300 km away. Which type of network out of LAN, WAN or MAN will be formed? Justify your answer. [1]
- (v) Suggest a protocol that shall be needed to provide help for transferring of files between Delhi and Kanpur branch. [1]

CN-26 5 Marks

Paper 4 · Q.37

‘CKNG Auto’ is a big car-selling agency having its Head Office in Delhi. It is planning to set up a new branch in Patiala. The Patiala branch will have four blocks – ADMIN, SALES, SERVICE and INSURANCE. You, as a network expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in points (I) to (V), keeping the following parameters in mind.

From	To	Distance
ADMIN	SALES	70 m
ADMIN	SERVICE	60 m
ADMIN	INSURANCE	65 m
SALES	SERVICE	80 m
SALES	INSURANCE	100 m
SERVICE	INSURANCE	60 m
Delhi Head Office	Patiala branch	250 km

Block	Number of computers
ADMIN	18
SALES	30

Block	Number of computers
SERVICE	20
INSURANCE	10

- (I) Suggest the most appropriate location of the server inside the Patiala branch. Justify your choice.
- (II) What kind of network (PAN/LAN/MAN/WAN) will be formed by interconnecting all the computers inside a block?
- (III) Draw the most effective cable layout to connect all four blocks of Patiala branch.
- (IV) Which device should be used to provide Internet connection to all the computers in the Patiala branch?
- (V) (a) Which is the best wired medium to connect the server of Patiala office to the head office at Delhi?

— OR —

- (b) Is there a need for repeater(s) in Patiala branch? Why, or why not?

CN-27 5 Marks

Paper 5 · Q.37

Sanjeevani is a big group of educational institutions with its head office in Hyderabad. It is planning to set up a new University in Amritsar. The Amritsar University Campus will have four blocks/buildings – ADMIN, ACADEMIC, HOSTEL, SPORTS. You, as a network expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in points (i) to (v), keeping in mind the distances between various blocks/buildings and other given parameters.

From	To	Distance
ADMIN	ACADEMIC	60 m
ADMIN	HOSTEL	160 m
ADMIN	SPORTS	80 m
ACADEMIC	HOSTEL	40 m
ACADEMIC	SPORTS	120 m
HOSTEL	SPORTS	150 m
Hyderabad Head Office	Amritsar University Campus	2000 km

Block	Number of computers
ADMIN	25

Block	Number of computers
ACADEMIC	600
HOSTEL	120
SPORTS	50

- (i) Suggest the most appropriate location of the server inside the Amritsar University Campus. Justify your choice.
- (ii) Draw the cable layout to efficiently connect various blocks within the Amritsar University Campus.
- (iii) Name any two wired media that can be used to connect various computers of a block inside Amritsar Campus.
- (iv) For the academic purpose, the University will provide its own 24×7 FM channel within the University Campus. Which communication medium, out of the following, is used by FM? (A) Radio Waves (B) Micro Waves (C) Infrared Waves
- (v) (a) The students will be attending a lot of online academic sessions and workshops. These will involve audio-visual communication. Write the full name of the protocol which will be used for such a communication through the internet.

— OR —

- (b) Where should a repeater be installed in Amritsar University campus to boost the signal between blocks? Justify your answer.

CN-28 5 Marks

Paper 6 · Q.37

‘Swabhaav’ is a big NGO working in the field of Psychological Treatment and Counselling, having its Head Office in Nagpur. It is planning to set up a center in Vijayawada. The Vijayawada Center will have four blocks – ADMIN, PSYCHIATRY, PSYCHOLOGY, and ICU. You, as a Network Expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in questions (i) to (v), keeping the following parameters in mind:

From	To	Distance
ADMIN	PSYCHIATRY	65 m
ADMIN	PSYCHOLOGY	65 m
ADMIN	ICU	65 m
PSYCHIATRY	PSYCHOLOGY	100 m
PSYCHIATRY	ICU	50 m
PSYCHOLOGY	ICU	50 m
Nagpur Head Office	Vijayawada Center	700 km

Block	Number of computers
ADMIN	16
PSYCHIATRY	40
PSYCHOLOGY	19
ICU	20

- (i) Suggest the most appropriate location of the server inside the Vijayawada Center. Justify your choice.
- (ii) Which hardware device will you suggest to connect all the computers within each block of Vijayawada Center?
- (iii) Draw a cable layout to efficiently connect various blocks within the Vijayawada Center.
- (iv) Where should the router be placed to provide internet to all the computers in the Vijayawada Center?
- (v) (a) The Manager at Nagpur wants to remotely access the computer in Admin block in Vijayawada. Which protocol will be used for this?

— OR —

- (b) Which type of Network (PAN, LAN, MAN or WAN) will be set up among the computers connected with Vijayawada Center?

