

SUBJECT-1-ENGLISH

Q.1 SAMPLE QUESTION PAPER

SECTION-A

(READING)

Read the following passage.

10 Marks

- 1) The growing preference for indigenous craft items is a welcome trend in today's globalised world, where mass-produced goods often dominate markets. These handcrafted products, rooted in the cultural and artistic traditions of their regions, offer more than just aesthetic appeal. They symbolise sustainability, support local economies, and preserve the heritage of diverse communities.
- 2) One of the primary reasons for choosing indigenous crafts is their eco-friendliness. Unlike factory-made products, most traditional crafts are created using natural, locally sourced materials. Artisans often employ time-tested methods that minimise waste and avoid harmful industrial processes. For example, pottery made from local clay, handwoven textiles using organic dyes, and bamboo-based crafts all have a much lower environmental footprint compared to their machine-made counterparts. By opting for these items, consumers indirectly contribute to reducing pollution and promoting sustainable practices.
- 3) Supporting indigenous crafts also strengthens local economies. Many artisans depend solely on their craft for livelihood, often working in small communities where opportunities for other forms of employment are limited. When people purchase their products, it provides a direct income to these artisans, empowering them and encouraging their craftsmanship. Initiatives like fair trade further ensure that artisans receive fair wages, fostering economic stability within their communities.
- 4) Moreover, indigenous craft items help preserve cultural heritage. Every handcrafted product carries a story—a glimpse into the traditions, beliefs, and skills passed down through generations. In India, whether it's paintings, terracotta jewellery, sculptures, athangudi tiles, mud work frames or many others, each item reflects the unique identity of its region. By choosing these crafts, people not only appreciate the artistry but also help keep these traditions alive in an era where cultural homogenisation threatens diversity.
- 5) In addition to their economic and cultural value, indigenous crafts add a personal touch to homes and wardrobes. Unlike mass-produced items, which often lack individuality, handcrafted products are unique. Each piece bears the imprint of the artisan's effort, creativity, and dedication, making it special for the buyer.
- 6) However, the preference for indigenous crafts requires sustained efforts to thrive. Governments, organisations, and consumers all have roles to play. Policies that promote local craftsmanship, provide training to artisans, and create global platforms for showcasing their work can boost the visibility and demand for these products. Consumers, too, must actively seek out and invest in handmade crafts rather than opting for cheaper, factory-made alternatives. Choosing indigenous craft items is a meaningful step toward a more sustainable and culturally enriched world.

Answer the following questions, based on the passage above.

- i) Why is the growing preference for indigenous craft items described as a 'welcome trend' in paragraph 1?
- ii) According to paragraph 1, the indigenous craft items have all the following qualities EXCEPT being:

A. handcrafted products

B. rooted in artistic traditions

C. aesthetic in appeal

D. easily accessible

iii) Complete the following by selecting the correct option from those given in the brackets.

The usage of locally sourced materials makes the indigenous crafts _____ (traditional / eco-friendly). (Paragraph 2)

iv) Select the option that is True from (a)-(c) given for what the phrase, 'time-tested methods' suggests in paragraph 2.

A. Artisans use traditional techniques that have been refined and proven effective over generations

B. Artisans use outdated practices that are no longer relevant in today's commercial markets.

C. Artisans follow techniques that prioritise speed and mass production over craftsmanship.

v) Complete the analogy by selecting one of the two correct options (a), (b)

fair trade: fair wages:: _____ : _____ (Paragraph 3)

(a)employment: job security (b) mass production : reduced prices

vi) Why is supporting indigenous crafts considered an effective way to improve the economic conditions of small communities? (Paragraph 3)

vii) What are the main ideas of paragraph 4 and paragraph 5?

a) Choosing indigenous crafts helps preserve cultural heritage

b) Handcrafted products lack individuality.

c) Indigenous crafts reflect the artisan's creativity.

d) Indigenous crafts promote uniformity by erasing regional differences in artistic traditions.

e) Cultural homogenisation encourages people to choose indigenous crafts over mass-produced goods.

Select the correct option.

OPTIONS	MAIN IDEA OF PARA 4	MAIN IDEA OF PARA 5
A.	li	lv
B.	v	li
C.	i	lii
D.	lv	li

viii) Why is it important for consumers to take an active role alongside government and organisations in sustaining indigenous crafts? (Paragraph 6)

2. Read the following passage.

1) A recent study conducted across two age groups—students aged 10–12 and 13–16—explored their preferences for ballpoint and micro-tip pens for various writing activities such as note-taking, examinations, and personal writing. The study aimed to understand trends in writing habits and the factors influencing pen selection among students.

2) The results revealed distinct patterns based on age groups and writing purposes. Among students aged 10–12, 65% preferred ballpoint pens for notetaking, citing ease of use and affordability as key factors. However, 35% opted for micro-tip pens, valuing their precision and smooth writing. For examinations, ballpoint pens were the overwhelming choice, with 78% favouring them for their speed and reliability, while 22% stuck with micro-tip pens, appreciating their fine control.

3) In the 13–16 age group, preferences shifted slightly. For notetaking, 60% favoured micro- tip pens, highlighting their ability to produce neat, legible notes, while 40% continued to use ballpoint pens. During

examinations, however, 70% still relied on ballpoint pens, indicating their consistency under time constraints. When it came to personal writing, such as journalling or creative tasks, 58% in this group chose micro-tip pens, appreciating the aesthetic appeal of finer lines, while 42% stuck with ballpoint pens for their convenience.

4) These findings point to the importance of understanding age-specific preferences and task requirements, enabling manufacturers to innovate products. Manufacturers could further explore incorporating hybrid features, such as pens offering the speed of ballpoint pens with the precision of micro-tip pens, to cater to a wider range of student preferences.

Answer the following questions, based on the passage above

i) Why did the study most likely focus on the two specific age groups of 10–12 and 13–16? (Paragraph 1)

This is so because these age groups ____.

A. represent the largest population of growing students.

B. are when students develop and refine their writing habits.

C. were the easiest to survey across various schools.

D. have a natural preference for ballpoint pens.

ii) Identify the phrase in paragraph 1 that conveys the writer's reference to the patterns or preferences observed in how students use pens for various writing tasks.

iii) Complete the following by selecting the correct option from those given in the brackets. (Paragraph 2)

Geetha, aged 11, wishes to complete her practical file neatly, ensuring her work is legible and appealing. She is most likely to choose a micro-tip pen for this task because the _____ (speed / precision) offered by this type of pen helps produce tidy work.

iv) What does the writer mean by 'affordability' while citing the high percentage of ball point pen usage? (Paragraph 2)

v) Complete the following with the correct option.

When the writer says, 'distinct patterns' in the line 'The results revealed distinct patterns based on age groups and writing purposes,' of paragraph 3, s/he means that _____.

A. *students in both age groups use pens in the same way for all the listed purposes.*

B. *the preferences for pens varied according to the students' age and the type of writing task.*

C. *only micro-tip pens were popular across all writing tasks in the 13-16 age group.*

D. *students of all age groups preferred ballpoint pens for completing creative writing tasks.*

vi) Complete the following appropriately.

The one likely reason why more than 40% of students still chose ballpoint pens for creative tasks, even though micro-tip pens are better suited for such activities is _____. (Paragraph 3)

vii) How are 'aesthetic appeal' and 'finer lines' connected? (Paragraph 3) 1

viii) Elaborate how hybrid features in pens would lead to a commercially viable product. (Paragraph 4) 2

ix) Fill in the blank with ONE suitable word. (Paragraph 4)

Understanding age-specific preferences helps manufacturers design products that cater to the unique needs of different age groups, ensuring their products are both _____ as well as appealing.

SECTION- B

WRITING SKILLS & GRAMMAR (20 marks)

3. Complete any ten of twelve of the following tasks, as directed.

i) Fill in the blank by using the correct form of the word in the bracket for the given portion of market research:

The special subscriptions of newspapers are well ____ (illustrate), to make reading interesting for school students.

ii) Identify the error and write the correction in the given sentence from a life skills' book.

The road to success is not the bed of roses.

Error	Correction

iii) Fill in the blank with the correct form of verb given in the brackets.

I'm so happy to see my plants again! They ____ (grow) so much since I last saw them.

iv) Read the given statement.

They said to the guide, "We'd love to come here again next year."

Report it correctly by completing the following.

They told the guide that _____.

v) Fill in the blank by choosing the correct option to complete the conclusion of a letter of placing order.

There would be no compromise _____ the quality of items supplied.

A. regards B. regard C. regardless D. regarding

vi) Report the following by completing the sentence correctly.

"Don't try mending the trousers yourself," she warned him.

She warned him _____.

vii) Complete the given opinion by filling the blank with correct option.

The experience of watching the movie left me ____ grateful for knowing the importance of being empathetic to others.

A. having felt B. feeling C. felt D. feel

viii) The given question has an error. Select the option that correctly identifies the error and the correction.

Which kind of person does something like that?

Sl.No.	ERROR	CORRECTION
A.	Which	what
B.	Kind	kinds
C.	Something	somethings
D.	That	this

ix) Report the following question.

She said to her sister, "Are you joining us for lunch today?"

x) Fill in the blank with the correct option from those given in the brackets.

Everyone is saying that Farhana's chances are bright in the upco

ming tournament and she ____ (must / may) become the youngest football player ever.

xi) Fill in the blank to complete the sentence in a teacher's diary by choosing the correct option

. ____ student in the class submitted their assignment on time.

A. All B. One C. Every D. A

xii) Choose the correct option to fill the blank.

I looked inside the bucket and saw there was _____ water in it, so they had to add more to use.

A. little B. any C. few D. least

SECTION-C

WRITING

4A) As Vaibhav, the Club in-charge of your school's Ecology Club, you strongly believe in the importance of starting Eco-Clubs in schools in the rural areas surrounding your city to promote the preservation and conservation of nature. Write a letter to the Education Secretary of your city, in about 120 words, highlighting the significance of ecological awareness and suggesting the need to establish Eco- Clubs in these schools.

OR

4B) As Amitha, the Vice Head Girl of Vidya Mandir, you are aware of the increasing prevalence of cyber-attacks and unauthorised exploitation of systems, networks, and technologies affecting individuals across all demographics. Write a letter to the editor of a national daily in about 120 words, stressing the urgent need to promote digital security among all age groups. Highlight the challenges posed by cyber threats and propose practical solutions to address this growing issue.

5A) You are the President of the Debate Society in your school. Two guest speakers --Mr. Rajan Sharma and Ms. Meera Kapoor, have written to express their interest in participating in your upcoming debate competition. Below are excerpts from their letters.

Excerpt 1

...I am thrilled to express my interest in participating as a guest speaker at your school's debate competition. With over 10 years of experience as a public speaker and debate coach, I have guided numerous students to success in national-level competitions. My approach focuses on encouraging critical thinking and fostering a passion for debating. I have previously spoken at various schools and universities, often receiving positive feedback for my engaging sessions and practical insights. I believe my experience and knowledge can inspire and empower your students to excel in debating.

Best regards

Mr. Rajan Sharma

Excerpt 2:

...It would be a privilege to participate as a guest speaker at your school's upcoming debate competition. I have participated in international debate forums and have won accolades for my arguments on global and social issues. My strength lies in connecting with young audiences and making debates relevant to real-world scenarios. I also emphasise how debating can improve public speaking, confidence, and interpersonal skills. I look forward to sharing my journey and experiences with your students to inspire them to use debating as a tool for personal growth.

Yours sincerely

Ms. Meera Kapoor

Analyse the information in a paragraph, justifying which guest speaker would be a better choice. Consider factors such as experience, relevance to the topic, and audience engagement.

OR

5B) Jaspreet, class X, is known for her creativity, excellent communication skills, and ability to think outside the box. However, she sometimes struggles with time management and prefers collaborative efforts over working solo. She has been assigned an art-integrated project presentation and must choose a partner from Sunaina, Tabassum, and Alice.

Below are the profiles of the three candidates.

Sunaina: Sunaina is highly disciplined and excels in meeting deadlines. She is known for her strong organisational skills and ability to handle multiple tasks efficiently. However, she is slightly reserved and prefers working in structured, predictable environments.

Tabassum: Tabassum is enthusiastic and spontaneous, with a talent for generating unique ideas. She is an excellent artist and thrives in creative settings. However, she occasionally struggles to stay focused on tasks and complete them on time.

Alice: Alice is confident and articulate, with a flair for delivering polished presentations. She is detail-oriented and ensures that the final product is of high quality. However, she sometimes prefers to take control and may overlook collaborative efforts.

Based on the features of each candidate, analyse and decide who would be the best partner for Jaspreet. Consider aspects such as complementary strengths, teamwork, and the project's requirements.

SECTION D

LITERATURE TEXTBOOK (40 marks)

6) Read the given extracts A and B and answer ANY ONE of the two.

A. He just felt a bit dizzy Then he flapped his wings once and he soared upwards. "Ga, ga, ga, Ga, ga, ga, Gaw-col-ah," his mother swooped past him, her wings making a loud noise. He answered her with another scream. Then his father flew over him screaming. He saw his two brothers and his sister flying around him curvetting and banking and soaring and diving. Then he completely forgot that he had not always been able to fly, and commended himself to dive and soar and curve, shrieking shrilly.

(Two Stories About Flying - First Flight)

i) Contradict the view that the young seagull celebrated his maiden flight alone.

ii) Which of the following statements best explains the young seagull's experience as he starts flying?

a) The young seagull immediately mastered flying and was no longer afraid.

b) The young seagull gradually gained confidence and joined his family in the air.

iii) What can be inferred about the young seagull's emotional state after flying with his family?

iv) Read the following sound and movement words.

i) flapped ii) shrieking iii) swooped iv) soared v) screaming

Select the option that correctly categorises (i) –(v) into sound and movement words.

No.	Sound	Movement
A	i ii v	iii iv
B	iv v	i ii iii
C	ii v	i iii iv
D	v	i ii iii iv

B. "Paper has more patience than people. I thought of this saying on one of those days when I was feeling a little depressed and was sitting at home with my chin in my hands, bored and listless, wondering whether to stay in or go out. I finally stayed where I was, brooding: Yes, paper does have more patience, and since I'm not planning to let anyone else read this stiff-backed notebook grandly referred to as a 'diary', unless I should ever find a real friend, it probably won't make a bit of difference."

(From the Diary of Anne Frank)

i) In light of the excerpt, what can we infer about the speaker's emotional state?

ii) The narrator enhances the narrative technique of the extract by using:

(A) descriptive language (B) literary allusions (C) humour (D) reflective

iii) Fill in the blank with the correct word from the bracket:

The narrator doesn't plan to let anyone read her diary as she doesn't have any real _____. (friend/incidents)

(iv) Why does the narrator say that 'paper has more patience than people'?

7) Read the given extracts A and B and answer ANY ONE of the two.

A. He is learning, well behind his desperate eyes,
The epistemology of loss, how to stand up
Knowing what every man must one day know
And most know many days, how to stand up.

(The Ball Poem)

i) What emotions are most appropriately conveyed by the phrase 'desperate eyes' and 'epistemology of loss'?

i) despair ii) anger iii) frustration iv) confusion v) helplessness

Select the correct option.

A. i, iii

B. i, iv, v

C. ii, iii, iv

D. iv, v

ii) What does the phrase 'how to stand up' suggest about the boy's emotional growth?

iii) Which phrase from the extract conveys the poet's idea that loss is universal?

iv) Fill in the blank with a phrase to suitably complete the sentence.

The loss of his ball symbolises _____ in life.

OR

B. Or if some time when roaming round,
A noble wild beast greets you,
With black stripes on a yellow ground,

Just notice if he eats you.
This simple rule may help you learn
The Bengal Tiger to discern.

(How to tell Wild Animals)

i). What does the poet imply by referring to the Bengal Tiger as a 'noble wild beast'?

- A. The tiger is majestic and dignified despite its ferocity.
- B. The tiger is kind and considerate toward humans.
- C. The tiger has a royal lineage and should be revered.
- D. The tiger is a symbol of fear and destruction.

ii) Complete the following suitably.

The word 'ground' in the line 'With black stripes on a yellow ground' refers to _____.

iii) How does the poet use humour in the description of the Bengal Tiger? 2

iv) Identify the phrase in the poem that is advisory in nature.

8. Answer ANY FOUR of the following five questions, in about 50 words each. 4x3=12

- a.) Otters are known for their peculiar behavioural traits. Support this statement with reference to any two traits mentioned in 'Mijbil the Otter.'
- b.) How does the use of repetition in the poem 'Amanda!' highlight the speaker's expectations and Amanda's responses?
- c.) How can Nelson Mandela's vision of 'liberating both the oppressed and the oppressor' be applied in modern-day societies to address issues of inequality and discrimination? (Nelson Mandela – Long Walk to Freedom)
- d.) How does the line 'and then moves on' reflect the transient nature of the fog thereby contributing to the poem's deeper message about life's impermanence? (Fog)
- e.) How does Chekov's reaction to Lomov's marriage proposal reflect his priorities and values? (The Proposal)

9) Answer ANY TWO of the following three questions, in about 40-50 words. 2x3=6

- a) How does 'The Necklace' illustrate the significance of honesty as the key element for leading a happy and stress-free life?
- b) Briefly evaluate the validity of the adage 'Values are caught, not taught', in the context of the relationship between Anil and Hari Singh in 'The Thief's Story'.
- c) Griffin's experiences moments of comfort and normalcy while being invisible. How do these fleeting moments impact his sense of identity and his actions throughout 'Footprints Without Feet'?

10) Answer ANY ONE of the following two questions, in about 100-120 words 1 x 6

- a). How does literature like 'The Baker from Goa,' 'Coorg,' and 'Tea from Assam' contribute to promoting tourism and raising awareness about regional cultures and traditions?

Or

- b) The poems, 'The Trees' and 'A Tiger in the Zoo' resonate the theme of importance of freedom and the desire to break free from any kind of dominance. Examine.

11) Answer ANY ONE of the following two questions, in about 100-120 words. 1 x 6

- a). How does the author use the narrative technique of misdirection in 'The Midnight Visitor', to enhance the suspense and the story's unexpected ending?

OR

- b) Comment critically on the role of the Surgery in the 'The Triumph of Surgery'.

Q.2 A. Reported Speech: Change into Indirect Speech (Grammar)

A. Read the conversation between a teacher and a student. Complete the reported speech by filling in the blank.

Teacher: Why are you late today?

Student: I missed the school bus.

The teacher asked the student why _____. The student replied that he had missed the school bus.

B. Change the following dialogue into reported speech.

Mother: Have you completed your homework?

Riya: No, I am still working on it.

C. Change the following into reported speech.

The doctor said to the patient, "Take your medicines regularly and avoid junk food."

D. Report the following dialogue.

Rahul: What are you doing here?

Aman: I am waiting for my friend.

E. Change the following into reported speech.

The principal said to the students, "Do not make noise in the corridor."

Q.3 COMPETENCY-BASED QUESTIONS

A. How does Richard Ebright's journey teach us the importance of scientific curiosity, perseverance and parental support in achieving success? Explain with reference to the chapter The Making of a Scientist.

B. How does Bholi's transformation highlight the importance of education in empowering individuals, especially girls? What message does her decision to reject Bishamber convey about self-respect and dignity?

C. What lesson does Tricki's recovery teach us about responsible pet ownership? How can excessive affection sometimes become harmful when it is not accompanied by proper care and discipline?

D. Griffin was a brilliant scientist, but his actions were irresponsible and selfish. What does his character teach us about the ethical use of scientific knowledge and the importance of moral values?

E. How can a teacher become an agent of social change? Explain how Bholi's teacher demonstrates the importance of patience, encouragement and equal opportunities in transforming a student's life.

Q.4 WRITING SKILLS

A. Attempt the following question in about 100–120 words. (5 marks)

You are Ananya Sharma, the Head Girl of Sunrise Public School, Bhubaneswar. Your school is organising a reading week to encourage students to develop reading habits. Write a letter to the Sales Manager of Oxford Bookstore, Bhubaneswar, placing an order for books for the school library. Mention the titles, quantities, discount expected and delivery instructions.

Hints:

- * Order books for Classes IX and X.
- * Include fiction, biographies and reference books.
- * Request a suitable institutional discount.
- * Ask for proper packaging and timely delivery.
- * Mention payment terms.

B. Formal Letter: Letter to the Editor

Attempt the following question in about 100–120 words. (5 marks)

You are Rahul Das, a resident of Sambalpur, Odisha. You are concerned about the increasing use of plastic bags and the improper disposal of plastic waste in your locality. Write a letter to the editor of a leading newspaper highlighting the harmful effects of plastic pollution and suggesting practical measures to address the problem.

Hints:

- * Plastic pollution and environmental damage.
 - * Harm to animals and aquatic life.
 - * Encourage reusable cloth and paper bags.
 - * Strict implementation of plastic restrictions.
 - * Public awareness campaigns and community participation.
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2.HINDI

खंड-1: व्याकरण अभ्यास

निम्नलिखित विषयों पर परिभाषा एवं उदाहरण सहित अभ्यास कीजिए:

रचना के आधार पर वाक्य-रूपांतरण

वाच्य

अलंकार

पद परिचय

प्रत्येक विषय पर कम-से-कम 10 अभ्यास प्रश्न हल कीजिए।

खंड-2 : लेखन-कौशल

निम्नलिखित विषयों में से किन्हीं एक विषय पर लगभग 120 शब्दों में अनुच्छेद लिखिए:

सोशल मीडिया और युवा पीढ़ी

जलवायु परिवर्तन की चुनौती

राष्ट्रीय शिक्षा नीति और विद्यार्थी

समय का सदुपयोग

1. निम्नलिखित में से किसी एक विषय पर औपचारिक पत्र लिखिए:

अपने क्षेत्र में सफाई व्यवस्था सुधारने हेतु नगर अधिकारी को पत्र ई मेल लिखिए।

1. किसी एक विषय पर सूचना लिखिए:

विद्यालय में हिंदी दिवस समारोह।

विद्यालय में अंतर-सदनीय वाद - विवाद प्रतियोगिता ।

1 किसी एक विषय पर विज्ञापन लिखिए -

शुद्ध घी या रेडीमेड वस्त्र या स्पोकन इंग्लिश या रक्तदान 🩸 शिविर

3.SANSKRIT

NO.01 तिरुक्कुरल्-सूक्ति – सौरभम् । (अष्टमः पाठः) (लेखनम्)

NO.02 रेखाङ्कितानि पदानि आधृत्य प्रश्ननिर्माणं कुरुत ।

क) पिता पुत्राय बाल्ये विद्याधनं यच्छति ।

ख) धैर्यवान् लोके परिभवं न प्राप्नोति ।

ग) साधूनां चित्ते वाचि च सरलता भवति ।

घ) वाक्पटुः मन्त्री परैर्न परिभूयते ।

NO.03 पदानां अर्थं लिखत ।

तथ्यतः , महत् , विमूढधीः , अवक्रता , श्रेष्ठः , आहुः , परुषाम् ।

NO. 04 अधस्ताद् समस्तपदानि पाठाधारेण दीयन्ताम् –

क) वाचि पटुः –

ख) न कातरः –

ग) न हितम् -

घ) तत्त्वार्थस्य निर्णयः –

ङ) धर्मं प्रददाति इति –

4.MATHEMATICS

Practice the last year Maths Question paper (any one set)

5.SCIENCE

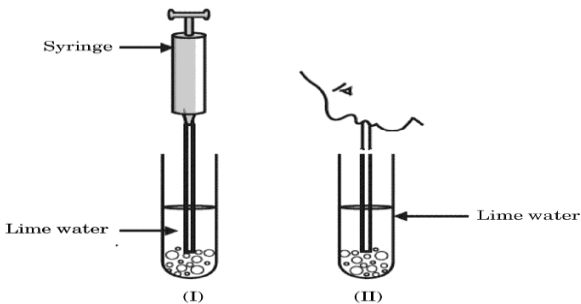
PRACTICE THE FOLLOWING SET OF QUESTION. WRITE IT IN YOUR PORTFOLIO.

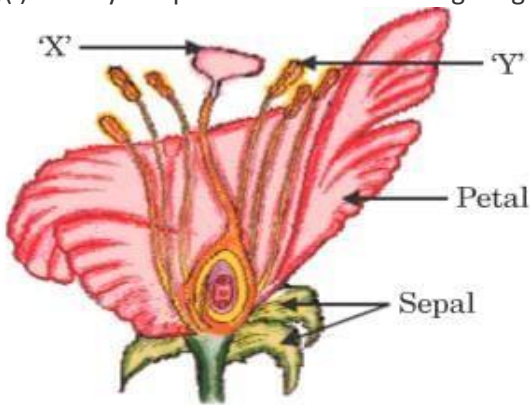
General instructions:

1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

Section – A (Biology)		
1	The mode of nutrition found in fungi is:	1

	(a) Parasitic nutrition (b) Holozoic nutrition (c) Autotrophic nutrition (d) Saprophytic nutrition	
2	The breakdown of pyruvate to give carbon di-oxide, water and energy takes place in (a) cytoplasm (b) mitochondria (c) chloroplast (d) nucleus	1
3	The plant hormone whose concentration stimulates the cells to grow longer on the side of the shoot which is away from light is: (a) Cytokinins (b) Gibberellins (c) Adrenaline (d) Auxin	1
4	If pea plants with round and green seeds (RRyy) are crossed with pea plants having wrinkled and yellow seeds (rrYY), the seeds developed by the plants of F ₁ generation will be: (A) 50% round and green (B) 75% wrinkled and green (C) 100% round and yellow (D) 75% wrinkled and yellow	1
5	Identify from the following a group containing all non-biodegradable substances. (a) Leather, Glass, Plastic (b) Cotton, Wood, Nylon (c) DDT, Polyester, Glass (d) Leather, Silk, Wool	1
6	Which one of the following is not a natural ecosystem? (a) Pond ecosystem (b) Grassland ecosystem (c) Forest ecosystem (d) Cropland ecosystem	1
7	The opening and closing of stomata is regulated by: (a) CO ₂ concentration in stomata (b) Temperature in guard cells (c) O ₂ concentration in stomata (d) Amount of water in guard cells	1
	Assertion - Reason based questions : These questions consist of two statements — Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: (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.	
8	Assertion (A): Human female has a perfect pair of sex chromosomes. Reason (R): Sex chromosome contributed by the human male in the zygote decides the sex of a child.	1
9	Assertion (A): The amount of ozone in the atmosphere began to drop sharply in the 1980s. Reason (R): The oxygen atoms combine with molecular oxygen to form ozone.	1
10	State the main function of arteries. Why do they have thick and elastic walls?	2
11	How is the small intestine designed to absorb digested food? OR  In the experimental set-up shown above in diagram (I) atmospheric air is being passed into lime water with a syringe while in diagram (II) air is being exhaled into lime water. The time taken for the lime water to turn milky in both the test tubes is different. Give reason.	2
12	In the following food chain, only 2J of energy was available to the peacocks. How much energy would have been present in Grass? Justify your answer. Grass → Grasshopper → Frog → Snake → Peacock	2
13	A hormone 'X' is secreted in blood when a person is under scary situation. (a) Identify the hormone 'X' and the gland that secretes it. (b) Explain its role in dealing with scary or emergency situations.	3
14	(a) How many chromosomes are present in human beings? Out of these how many are sex chromosomes? (b) Explain how, in sexually reproducing organisms, the number of chromosomes in the progeny is maintained.	3
15	The following question is Source-based/Case-based question. Read the case carefully and answer the question that follow.	4

	The maintenance functions of all living organisms must go on even when they are not doing anything particular. Even when we are just sitting in a class or even asleep, this maintenance job has to go on. These maintenance processes require energy to prevent damage and break-down of cells and tissues, which is obtained by the individual organism from the food prepared by the autotrophs, called producers ATTEMPT EITHER OPTION A OR B (A)(a) Name and define the process by which green plants prepare food. (b) Write chemical equation involved in the above process. (c) Mention the major events during photosynthesis. OR (B) (a) Explain giving reasons what happens to the rate at which the green plants will prepare food: (I) during cloudy weather, and (II) when stomata get blocked due to dust. (b) Plants have low energy needs as compared to animals. Explain.	
16	ATTEMPT EITHER OPTION A OR B (A)(i) Identify the parts 'X' and 'Y' in the figure given below:  (ii) Name the yellowish colored structures produced by the part labelled as 'Y'. (iii) Write the name of the process by which these are transferred to the part labelled as 'X'. (iv) Explain the process of seed formation in a flowering plant. OR (B)(a) Name the part performing the following functions in human female reproductive system: (i) production of eggs, (ii) site of fertilization, (iii) site of implantation, (iv) entry of the sperms. (b) What changes are observed in the uterus: (i) subsequent to implantation of zygote and (ii) if an egg does not get fertilized?	5
SECTION – B(Chemistry)		
17	The values of a, b, c and d in the following balanced chemical equation are respectively: $a\text{Pb}(\text{NO}_3)_2 \rightarrow b\text{PbO} + c\text{NO}_2 + d\text{O}_2$ are: (a) 1, 1, 2, 1 (b) 1, 1, 1, 2 (c) 2, 2, 1, 4 (d) 2, 2, 4, 1	1
18	In which one of the following situations a chemical reaction does not occur? (a) Milk is left open at room temperature during summer (b) Grapes get fermented (c) An iron nail is left exposed to humid atmosphere (d) Melting of glaciers	1
19	The main observations while burning magnesium ribbon in air are: (i) Magnesium ribbon burns with a dazzling white flame (ii) A white powder is formed (iii) Magnesium ribbon vaporizes (iv) Aqueous solution of the white powder turns blue litmus red (a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (ii) (d) (iii) and (iv)	1
20	In one formula unit of salt 'X', seven molecules of water of crystallisation are present. The salt 'X' is: (a) CuSO_4 (b) Na_2CO_3 (c) FeSO_4 (d) CaSO_4	1
21	A few pieces of granulated zinc are taken in a test tube and 2 mL of sodium hydroxide solution is added to it. When the contents are warmed, the product formed is: (a) Na_2ZnO (b) NaZnO_2 (c) Na_2ZnO_2 (d) $\text{NaZn}(\text{OH})_2$	1
22	When a mixture of baking soda and tartaric acid is heated (or mixed in water) a product 'X' is formed, which is responsible for making breads and cakes soft and spongy. The product 'X' is (a) Carbon dioxide (b) Carbon monoxide (c) Sodium tartrate (d) Hydrogen	1
23	Select a pair of natural indicators from the following:	1

	(a) Litmus and methyl orange (b) Turmeric and Litmus (c) Phenolphthalein and methyl orange (d) Methyl orange and Turmeric																										
24	Assertion - Reason based questions : This question consist of two statements — Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: (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): Carbon and its compounds are our major sources of fuels. Reason (R): Most of the carbon compounds on burning release a large amount of heat and light.	1																									
25	Cinnabar is an ore of a metal 'X'. When this ore is heated in air, it is first converted into oxide of 'X' (XO) and then reduced to metal 'X' on further heating. Identify metal 'X' and write chemical equations for the reactions that occur in the above processes.	2																									
26	Samples of four metals A, B, C, and D were added one by one to the following solutions. The results obtained were tabulated as follows: <table border="1"><thead><tr><th>Solution / Metal</th><th>Iron Sulphate</th><th>Copper Sulphate</th><th>Zinc Sulphate</th><th>Aluminium Sulphate</th></tr></thead><tbody><tr><td>A</td><td>-</td><td>Displacement</td><td>No reaction</td><td>No reaction</td></tr><tr><td>B</td><td>Displacement</td><td>Displacement</td><td>Displacement</td><td>-</td></tr><tr><td>C</td><td>Displacement</td><td>?</td><td>-</td><td>No reaction</td></tr><tr><td>D</td><td>No reaction</td><td>No reaction</td><td>No reaction</td><td>No reaction</td></tr></tbody></table> (i) Which is the least reactive metal? (ii) What would be observed if C is added to a solution of copper sulphate? (iii) Arrange the metals A, B, C, and D in the order of their decreasing reactivity.	Solution / Metal	Iron Sulphate	Copper Sulphate	Zinc Sulphate	Aluminium Sulphate	A	-	Displacement	No reaction	No reaction	B	Displacement	Displacement	Displacement	-	C	Displacement	?	-	No reaction	D	No reaction	No reaction	No reaction	No reaction	3
Solution / Metal	Iron Sulphate	Copper Sulphate	Zinc Sulphate	Aluminium Sulphate																							
A	-	Displacement	No reaction	No reaction																							
B	Displacement	Displacement	Displacement	-																							
C	Displacement	?	-	No reaction																							
D	No reaction	No reaction	No reaction	No reaction																							
27	What are amphoteric oxides? With the help of balanced chemical equations show that aluminium oxide is an amphoteric oxide. OR (a) Show the formation of calcium oxide by the transfer of electrons. (b) Name the ions present in this compound. (c) List two important characteristics of this compound.	3																									
28	The following questions are source-based/case-based questions. Read the case carefully and answer the questions that follow: Three metal samples of magnesium, aluminium and iron were taken and rubbed with sand paper. These samples were then put separately in test tubes containing dilute hydrochloric acid. Thermometers were also suspended in each test tube so that their bulbs dipped in the acid. The rate of formation of bubbles was observed. The above activity was repeated with dilute nitric acid and the observations were recorded. ATTEMPT EITHER OPTION A OR B Answer the following questions: (A)(a) When activity was done with dilute hydrochloric acid, then in which one of the test tubes was the rate of formation of bubbles the fastest and the thermometer showed the highest temperature? (b) Which metal did not react with dilute hydrochloric acid? Give reason. (c) Why is hydrogen gas not evolved when a metal reacts with dilute nitric acid? Name the ultimate products formed in the reaction. OR (B)(a) Name the type of reaction on the basis of which reactivity of metals is decided. You have two metals X and Y. How would you decide which is more reactive than the other?	4																									

	(b) What happens when nitric acid is added to egg-shell?	
29	ATTEMPT EITHER OPTION A OR B (A)(a) Name two cyclic hydrocarbons and draw the structure of any one. (b) Explain the process of micelle formation on adding soap in water OR (B) Name an alcohol and a carboxylic acid having two carbon atoms in their structures. Draw their structures and state how this alcohol can be converted into a carboxylic acid. What happens when these two compounds react in the presence of an acid? Write chemical equations for the reactions involved in the two cases mentioned above.	5
	SECTION- C (Physics)	
30	Mirror 'X' is used to concentrate sunlight in a solar furnace, and Mirror 'Y' is fitted on the side of the vehicle to see the traffic behind the driver. Which of the following statements are true for the two mirrors? (i) The image formed by mirror 'X' is real, diminished, and at its focus. (ii) The image formed by mirror 'Y' is virtual, diminished, and erect. (iii) The image formed by mirror 'X' is virtual, diminished, and erect. (iv) The image formed by mirror 'Y' is real, diminished, and at its focus. (A) (i) and (ii) (B) (ii) and (iii) (C) (iii) and (iv) (D) (i) and (iv)	1
31	Most of the refraction for the light rays entering the eye occurs at: (a) Iris (b) Pupil (c) Crystalline lens (d) Outer surface of Cornea	1
32	Assertion - Reason based questions : This question consist of two statements — Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: (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) : For observing traffic at back, the driver mirror is convex mirror. Reason (R) : A convex mirror has much larger field of view than a plane mirror.	1
33	A ray of light enters from vacuum to glass of absolute refractive index 1.5. Find the speed of light in glass. The speed of light in vacuum is 3×10^8 m/s.	2
34	Heat produced per second due to a current in a resistor of 4Ω is 400 joules. Calculate the potential difference across the resistor.	2
35	A person uses lenses of power -0.5 D in his spectacles for the correction of his vision. (a) Name the defect of vision the person is suffering from. (b) List two causes of this defect.	3
36	(a) Define one volt potential difference between two points in an electric field. (b) Draw a schematic diagram of an electric circuit of a cell of 1.5 V, 5Ω and 10Ω resistors, and a plug key, all connected in series. Calculate the current drawn from the cell when the key is closed.	3
37	(i) Why is an alternating current (A.C.) considered to be advantageous over direct current (D.C.) for the long distance transmission of electric power? (ii) How is the type of current used in household supply different from the one given by a battery of dry cells? (iii) How does an electric fuse prevent the electric circuit and the appliances from the possible damage due to short circuiting or overloading.	3
38	The variation of image distance (v) with object distance (u) for a convex lens is given in the following observation table. Analyse it and answer the questions that follow:	4

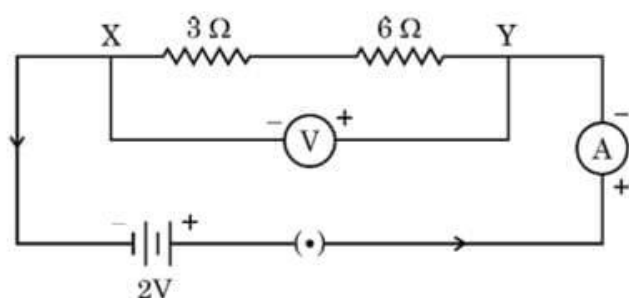
S. No.	Object distance (u) cm	Image distance (v) cm
1	- 150	+ 30
2	- 75	+ 37.5
3	- 50	+ 50
4	- 37.5	+ 75
5	- 30	+ 150
6	- 15	+ 37.5

- (i) Without calculation, find the focal length of the convex lens. Justify your answer.
(ii) Which observation is not correct? Why? Draw ray diagram to find the position of the image formed for this position of the object.
(iii) Find the approximate value of magnification for $u = -30$ cm.

39 ATTEMPT EITHER OPTION A OR B

5

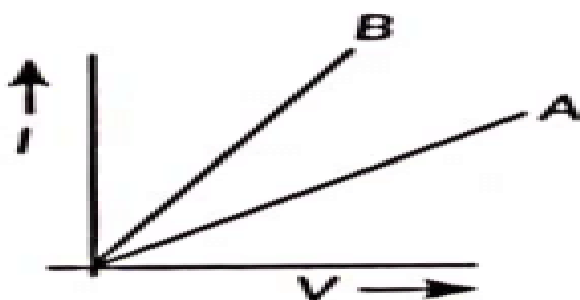
(A) Study the circuit shown in which two resistors X and Y of resistances $3\ \Omega$ and $6\ \Omega$ respectively are joined in series with a battery of 2 V.



- (I) Draw a circuit diagram showing the above two resistors X and Y joined in parallel with the same battery and same ammeter and voltmeter.
(II) In which combination of resistors will the (i) potential difference across X and Y, and (ii) current through X and Y, be the same?
(III) Find the current drawn from the battery by the series combination of the two resistors (X and Y).

OR

- (B)(i) How is electric current related to the potential difference across the terminals of a conductor? Draw the labelled circuit diagram to verify this relationship.
(ii) Why should an ammeter have low resistance?
(iii) Two V-I graphs A and B for series and parallel combinations of two resistors are as shown. Giving reason state which graph shows (a) series, (b) parallel combination of the resistors.



6.SOCIAL SCIENCE

1. Describe the role of formal sector of credit in the economic development.
 2. Explain the functioning of Self-Help Groups (SHGs).
 3. “Democracy is a better form of government than any other alternative”. Analyse the statement.
 4. What is the relevance of non-conventional sources of energy in a country like India? Explain with example.
 5. On the map of India locate the following places-

i) Kudankulam	vi) Madras
ii) Champaran	vii) Ballari
iii) Kheda	viii) Pune
iv) Hirakud	ix) Bhrakra-Nangal
v) Amritsar	x) Bailadila
-

7.MATHEMATICS

- 1.Solve the given two sets of mathematics paper and submit after the break.

Series : H4EFG



SET ~ 3

रोल नं.
Roll No.



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प्रश्न-पत्र कोड
Q.P. Code 30/4/3

परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।
Candidates must write the Q.P. Code on the title page of the answer-book.

नोट

- (I) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 15 हैं।
- (II) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 38 प्रश्न हैं।
- (III) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- (IV) कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में यथास्थान पर प्रश्न का क्रमांक अवश्य लिखें।
- (V) इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।

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NOTE

- (I) Please check that this question paper contains 15 printed pages.
- (II) Please check that this question paper contains 38 questions.
- (III) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- (IV) Please write down the Serial Number of the question in the answer-book at the given place before attempting it.
- (V) 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.



गणित (मानक)

MATHEMATICS (STANDARD)



निर्धारित समय : 3 घण्टे
Time allowed : 3 hours

अधिकतम अंक : 80
Maximum Marks : 80



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General Instructions :

Read the following instructions carefully and follow them :

- (i) This question paper contains **38** questions. **All** questions are **compulsory**.
- (ii) This question paper is divided into **five** Sections – **A, B, C, D** and **E**.
- (iii) In **Section A** – Question numbers **1** to **18** are multiple choice questions (MCQs) and question numbers **19** and **20** are Assertion – Reason based questions of **1** mark each.
- (iv) In **Section B** – Question numbers **21** to **25** are very short answer (VSA) type questions, carrying **2** marks each.
- (v) In **Section C** – Question numbers **26** to **31** are short answer (SA) type questions, carrying **3** marks each.
- (vi) In **Section D** – Question numbers **32** to **35** are long answer (LA) type questions carrying **5** marks each.
- (vii) In **Section E** – Question numbers **36** to **38** are **case-study based integrated** questions carrying **4** marks each. Internal choice is provided in **2** marks question in each case-study.
- (viii) There is no overall choice. However, an internal choice has been provided in **2** questions in Section **B**, **2** questions in Section **C**, **2** questions in Section **D** and **3** questions of **2** marks in Section **E**.
- (ix) Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.
- (x) Use of calculators is **NOT** allowed.

SECTION – A

20×1 = 20

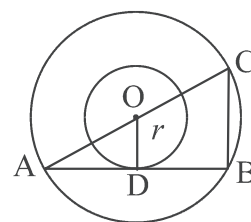
This section consists of 20 questions of 1 mark each.

- 1. A 30 m long rope is tightly stretched and tied from the top of pole to the ground. If the rope makes an angle of 60° with the ground, the height of the pole is : **1**
(a) $10\sqrt{3}$ m (b) $30\sqrt{3}$ m (c) 15 m (d) $15\sqrt{3}$ m
- 2. On the top face of the wooden cube of side 7 cm, hemispherical depressions of radius 0.35 cm are to be formed by taking out the wood. The maximum number of depressions that can be formed is : **1**
(a) 400 (b) 100 (c) 20 (d) 10
- 3. The cumulative frequency for calculating median is obtained by adding the frequencies of all the : **1**
(a) classes up to the median class
(b) classes following the median class
(c) classes preceding the median class
(d) all classes
- 4. If mode and median of given set of observations are 13 and 11 respectively, then the value of mean is : **1**
(a) 17 (b) 7 (c) 10 (d) 28



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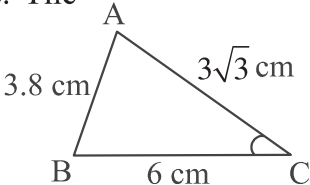
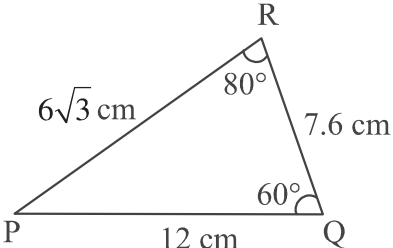
5. In the adjoining figure, AC is diameter of larger circle with centre O. AB is tangent to smaller circle with centre O. If $OD = r$, then BC is equal to :



- (a) r (b) $\frac{3r}{2}$ (c) $2r$ (d) $4r$ 1
6. A parallelogram having one of its sides 5 cm circumscribes a circle. The perimeter of parallelogram is : 1
- (a) 20 cm (b) less than 20 cm (c) more than 20 cm but less than 40 cm (d) 40 cm
7. E and F are points on the sides AB and AC respectively of a ΔABC such that $\frac{AE}{EB} = \frac{AF}{FC} = \frac{1}{2}$. Which of the following relation is true ? 1
- (a) $EF = 2BC$ (b) $BC = 2EF$ (c) $EF = 3BC$ (d) $BC = 3EF$
8. Which of the following statements is true for a polynomial $p(x)$ of degree 3? 1
- (a) $p(x)$ has at most two distinct zeroes.
 (b) $p(x)$ has at least two distinct zeroes.
 (c) $p(x)$ has exactly three distinct zeroes.
 (d) $p(x)$ has at most three distinct zeroes.
9. Letters A to F are mentioned on six faces of a die such that each face has a different letter. Two such dice are thrown simultaneously. The probability that vowels turn up on both the dice is : 1
- (a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{9}$ (d) $\frac{1}{36}$
10. If $x = ab^3$ and $y = a^3b$, where a and b are prime numbers, then $[HCF(x, y) - LCM(x, y)]$ is equal to : 1
- (a) $1 - a^3b^3$ (b) $ab(1 - ab)$
 (c) $ab - a^4b^4$ (d) $ab(1 - ab)(1 + ab)$
11. $(1 + \sqrt{3})^2 - (1 - \sqrt{3})^2$ is : 1
- (a) a positive rational number. (b) a negative integer.
 (c) a positive irrational number. (d) a negative irrational number.
12. The value of 'a' for which $ax^2 + x + a = 0$ has equal and positive roots is : 1
- (a) 2 (b) -2 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$
13. The distance of point P(1, -1) from x-axis is : 1
- (a) 1 (b) -1 (c) 0 (d) $\sqrt{2}$



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14. The number of red balls in a bag is 10 more than the number of black balls. If the probability of drawing a red ball at random from this bag is $\frac{3}{5}$, then the total number of balls in the bag is : 1
 (a) 50 (b) 60 (c) 80 (d) 40
15. The value of 'p' for which the equations $px + 3y = p - 3$, $12x + py = p$ has infinitely many solutions is : 1
 (a) -6 only (b) 6 only
 (c) ± 6 (d) Any real number except ± 6
16. $\triangle ABC$ and $\triangle PQR$ are shown in the adjoining figures. The measure of $\angle C$ is : 1
 (a) 140°
 (b) 80°
 (c) 60°
 (d) 40°
- 

17. $\sec A = 2 \cos A$ is true for $A =$ 1
 (a) 0° (b) 30° (c) 45° (d) 60°
18. Which of the following statements is true ? 1
 (a) $\sin 20^\circ > \sin 70^\circ$ (b) $\sin 20^\circ > \cos 20^\circ$
 (c) $\cos 20^\circ > \cos 70^\circ$ (d) $\tan 20^\circ > \tan 70^\circ$

Directions :

In question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option :

- (a) Both, Assertion (A) and Reason (R) are true and Reason (R) is 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.
19. **Assertion (A) :** Tangents drawn at the end points of a diameter of a circle are always parallel to each other.
Reason (R) : The lengths of tangents drawn to a circle from a point outside the circle are always equal. 1
20. **Assertion (A) :** Unit digit of 3^n cannot be an even number for any natural number n .
Reason (R) : 2 is not a prime factor of 3^n for any natural number n . 1



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SECTION – B

This section consists of 5 questions of 2 marks each.

21. (A) A 1.5 m tall boy is walking away from the base of a lamp post which is 12 m high, at the speed of 2.5 m/sec. Find the length of his shadow after 3 seconds. 2

OR

- (B) In parallelogram ABCD, side AD is produced to a point E and BE intersects CD at F. Prove that $\triangle ABE \sim \triangle CFB$ 2
22. Find the coordinates of the point C which lies on the line AB produced such that $AC = 2BC$, where coordinates of points A and B are $(-1, 7)$ and $(4, -3)$ respectively. 2
23. (A) Find the value of x for which $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = x + \tan^2 A + \cot^2 A$ 2

OR

- (B) Evaluate the following : 2
- $$\frac{3 \sin 30^\circ - 4 \sin^3 30^\circ}{2 \sin^2 50^\circ + 2 \cos^2 50^\circ}$$
24. Renu and Simran were born in the year 2000 which is a leap year. Find the probability that : 2
- (i) both have same birthday.
- (ii) both have different birthdays.
25. Solve the following system of equations algebraically : 2
- $$73x - 37y = 109$$
- $$37x - 73y = 1$$

SECTION – C

This section consists of 6 questions of 3 marks each.

26. P (x, y) , Q $(-2, -3)$ and R $(2, 3)$ are the vertices of a right triangle PQR right angled at P. Find the relationship between x and y . Hence, find all possible values of x for which $y = 2$. 3
27. (A) Prove that $\frac{\cos A + \sin A - 1}{\cos A - \sin A + 1} = \operatorname{cosec} A - \cot A$ 3

OR

- (B) If $\cot \theta + \cos \theta = p$ and $\cot \theta - \cos \theta = q$,
prove that $p^2 - q^2 = 4\sqrt{pq}$ 3
28. If α and β are the zeroes of the polynomial $ax^2 - x + c$. Obtain a polynomial whose zeroes are $\alpha - 3$ and $\beta - 3$. 3
29. Rectangle ABCD circumscribes the circle of radius 10 cm. Prove that ABCD is a square. Hence, find the perimeter of ABCD. 3



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30. (A) Prove that $\sqrt{2}$ is an irrational number. 3

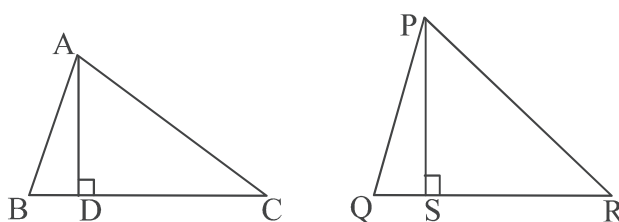
OR

- (B) Let x and y be two distinct prime numbers and $p = x^2 y^3$, $q = xy^4$, $r = x^5 y^2$. Find the HCF and LCM of p , q and r . Further check if $\text{HCF}(p, q, r) \times \text{LCM}(p, q, r) = p \times q \times r$ or not. 3
31. The perimeter of a rectangle is 70 cm. The length of the rectangle is 5 cm more than twice its breadth. Express the given situation as a system of linear equations in two variables and hence solve it. 3

SECTION – D

This section consists of 4 questions of 5 marks each.

32. (A) The corresponding sides of $\triangle ABC$ and $\triangle PQR$ are in the ratio 3 : 5. $AD \perp BC$ and $PS \perp QR$ as shown in the following figures : 5



- (i) Prove that $\triangle ADC \sim \triangle PSR$
(ii) If $AD = 4$ cm, find the length of PS .
(iii) Using (ii) find $\text{ar}(\triangle ABC) : \text{ar}(\triangle PQR)$

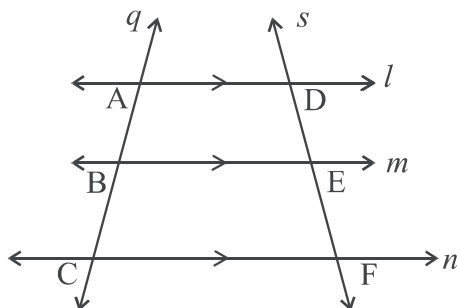
OR

- (B) State basic proportionality theorem.

Use it to prove the following :

If three parallel lines l , m , n are intersected by transversals q and s as shown in the adjoining figure,

$$\text{then } \frac{AB}{BC} = \frac{DE}{EF}.$$



5

33. A bat manufacturing company made a huge bat for charity and got it signed by world cup winning team.

The dimensions of the bat which is in the form of a cuboid with a cylindrical handle at the top are as follows :

length = 2 m, width = 0.5 m, thickness = 0.1 m

diameter of cylindrical part = 0.1 m

height of cylindrical part = 0.7 m

Find the volume of wood used in the bat. Also, find the total surface area of the wooden bat. 5



• • •

34. Following table shows the absentees record of 40 students in an academic year :

Number of Days	Number of Students
2-6	11
6-10	10
10-14	7
14-18	4
18-22	4
22-26	3
26-30	1

Find the 'mean' and the 'mode' of the above data.

5

35. (A) The sides of a right triangle are such that the longest side is 4 m more than the shortest side and the third side is 2 m less than the longest side. Find the length of each side of the triangle. Also, find the difference between the numerical values of the area and the perimeter of the given triangle.

5

OR

- (B) Express the equation $\frac{x-2}{x-3} + \frac{x-4}{x-5} = \frac{10}{3}$; ($x \neq 3, 5$) as a quadratic equation in standard form. Hence, find the roots of the equation so formed.

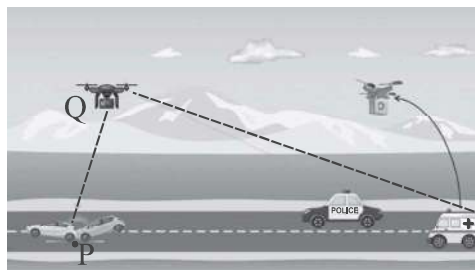
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SECTION – E

This section consists of 3 Case-study based questions of 4 marks each.

36. A drone was used to facilitate movement of an ambulance on the straight highway to a point P on the ground where there was an accident.

The ambulance was travelling at the speed of 60 km/h. The drone stopped at a point Q, 100 m vertically above the point P. The angle of depression of the ambulance was found to be 30° at a particular instant.



Based on above information, answer the following questions :

- Represent the above situation with the help of a diagram.
- Find the distance between the ambulance and the site of accident (P) at the particular instant. (Use $\sqrt{3} = 1.73$)
- (a) Find the time (in seconds) in which the angle of depression changes from 30° to 45° .

1

1

2

OR

- (b) How long (in seconds) will the ambulance take to reach point P from a point T on the highway such that angle of depression of the ambulance at T is 60° from the drone ?

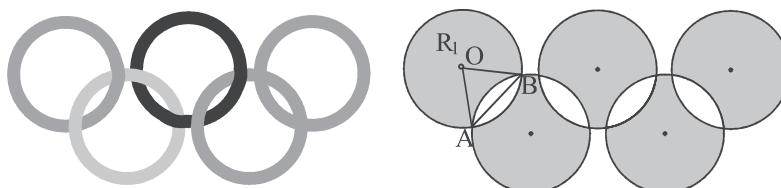
2



• • •

37. The Olympic symbol comprising five interlocking rings represents the union of the five continents of the world and the meeting of athletes from all over the world at the Olympic games. In order to spread awareness about Olympic games, students of Class-X took part in various activities organised by the school. One such group of students made 5 circular rings in the school lawn with the help of ropes. Each circular ring required 44 m of rope.

Also, in the shaded regions as shown in the figure, students made rangoli showcasing various sports and games. It is given that $\triangle OAB$ is an equilateral triangle and all unshaded regions are congruent.



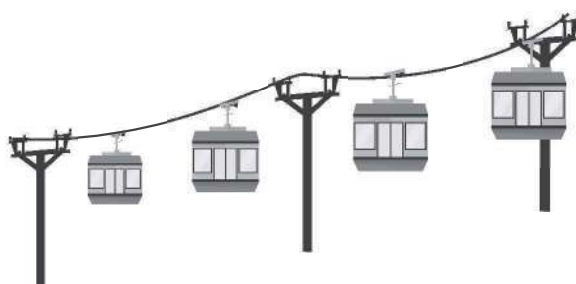
Based on above information, answer the following questions :

- | | |
|--|---|
| (i) Find the radius of each circular ring. | 1 |
| (ii) What is the measure of $\angle AOB$? | 1 |
| (iii) (a) Find the area of shaded region R_1 . | 2 |

OR

- | | |
|--|---|
| (iii) (b) Find the length of rope around the unshaded regions. | 2 |
|--|---|

38. Cable cars at hill stations are one of the major tourist attractions. On a hill station, the length of cable car ride from base point to top most point on the hill is 5000 m. Poles are installed at equal intervals on the way to provide support to the cables on which car moves.



The distance of first pole from base point is 200 m and subsequent poles are installed at equal interval of 150 m. Further, the distance of last pole from the top is 300 m.

Based on above information, answer the following questions using Arithmetic Progression :

- | | |
|--|---|
| (i) Find the distance of 10 th pole from the base. | 1 |
| (ii) Find the distance between 15 th pole and 25 th pole. | 1 |
| (iii) (a) Find the time taken by cable car to reach 15 th pole from the top if it is moving at the speed of 5m/sec and coming from top. | 2 |

OR

- | | |
|--|---|
| (iii) (b) Find the total number of poles installed along the entire journey. | 2 |
|--|---|



Series : EH5GF



SET ~ 2



रोल नं.

Roll No.



प्रश्न-पत्र कोड 30/5/2
Q.P. Code

परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।

Candidates must write the Q.P. Code on the title page of the answer-book.

नोट

- (I) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 23 हैं।
- (II) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 38 प्रश्न हैं।
- (III) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- (IV) कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में यथा स्थान पर प्रश्न का क्रमांक अवश्य लिखें।
- (V) इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक परीक्षार्थी केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।

NOTE

- (I) Please check that this question paper contains 23 printed pages.
- (II) Please check that this question paper contains 38 questions.
- (III) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- (IV) Please write down the serial number of the question in the answer-book at the given place before attempting it.
- (V) 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.



गणित (मानक)



MATHEMATICS (Standard)

निर्धारित समय : 3 घण्टे

Time allowed : 3 hours

अधिकतम अंक : 80

Maximum Marks : 80



• • •

General Instructions :

Read the following instructions very carefully and strictly follow them :

- (i) *This question paper contains **38** questions. **All** questions are **compulsory**.*
- (ii) *This question paper is divided into **FIVE** Sections – **A, B, C, D** and **E**.*
- (iii) *In Section–**A**, question numbers **1** to **18** are Multiple Choice Questions (MCQs) and question numbers **19** and **20** are Assertion-Reason based questions of **1** mark each.*
- (iv) *In Section–**B**, question numbers **21** to **25** are Very Short Answer (VSA) type questions, carrying **2** marks each.*
- (v) *In Section–**C**, question numbers **26** to **31** are Short Answer (SA) type questions, carrying **3** marks each.*
- (vi) *In Section–**D**, question numbers **32** to **35** are Long Answer (LA) type questions, carrying **5** marks each.*
- (vii) *In Section–**E**, question numbers **36** to **38** are Case Study based integrated questions carrying **4** marks each. Internal choice is provided in **2** marks questions in each case-study.*
- (viii) *There is no overall choice. However, an internal choice has been provided in **2** questions in Section–**B**, **2** questions in Section–**C**, **2** questions in Section–**D** and **3** questions of **2** marks in Section–**E**.*
- (ix) *Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.*
- (x) *Use of calculators is **NOT** allowed.*



• • •

SECTION – A

This section consists of 20 multiple choice questions of 1 mark each.

1. Following data shows the marks obtained by 100 students in a class test : 1

Marks obtained	20	29	28	33	42	38	43	25
Number of students	6	28	24	15	2	4	1	20

The median will be the average of which two observations ?

- (A) 29 and 33 (B) 25 and 28
 (C) 28 and 29 (D) 33 and 38

2. The probability of getting a composite number greater than 3 on throwing a die is 1

- (A) $\frac{1}{6}$ (B) $\frac{1}{3}$
 (C) $\frac{1}{2}$ (D) $\frac{2}{3}$

3. $(\sqrt{3} + 2)^2 + (\sqrt{3} - 2)^2$ is a/an 1

- (A) positive rational number (B) negative rational number
 (C) positive irrational number (D) negative irrational number

4. Let $a = p^2 q^3 r^n$ and $b = p^3 q^m r^2$, where p, q, r are prime numbers. If LCM of a and b is $p^3 q^4 r^3$, then the value of $3n - 2m$ is 1

- (A) -1 (B) 1
 (C) 3 (D) -3

5. For any prime number p, if p divides a^2 , where a is any real number then p also divides 1

- (A) a (B) $a^{\frac{1}{2}}$
 (C) $a^{\frac{3}{2}}$ (D) $a^{\frac{1}{8}}$



• • •

6. The point P divides the line segment AB in the ratio 3 : 1 as shown below : 1



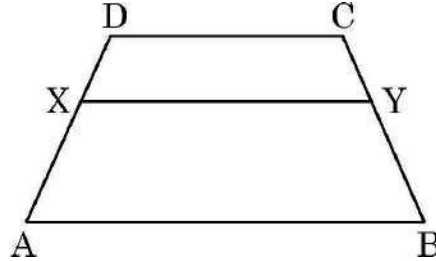
The value of $\frac{AB}{PB}$ is

- (A) 3 (B) $\frac{1}{4}$
(C) 4 (D) $\frac{1}{3}$
7. If $x^2 + bx + b = 0$ has two real and distinct roots, then the value of b can be 1
(A) 0 (B) 4
(C) 3 (D) -3
8. Which of the following equations is a quadratic equation ? 1
(A) $x^3 = (x - 1)^3 + 3x^2$ (B) $x^3 = (x + 1)^3$
(C) $x^2 = \sqrt{x}$ (D) $x^2 + 1 = \frac{1}{x}$
9. A piggy bank contains ₹ 1 coins and ₹ 2 coins in the ratio 9 : 11 respectively. The piggy bank is accidentally dropped and a coin pops out of it. The probability that it is a ₹ 2 coin is 1
(A) $\frac{9}{11}$ (B) 0.45
(C) 0.55 (D) $\frac{1}{11}$
10. Which of the following statements is false ? 1
(A) Two right triangles are always similar.
(B) Two squares are always similar.
(C) Two equilateral triangles are always similar.
(D) Two circles are always similar.

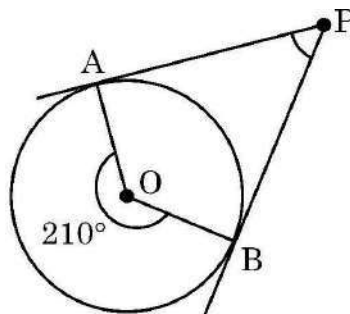


• • •

11. In the adjoining figure, ABCD is a trapezium in which $XY \parallel AB \parallel CD$. If $AX = \frac{2}{3}AD$, then $CY : YB =$ 1



- (A) 2 : 3 (B) 3 : 2
(C) 1 : 3 (D) 1 : 2
12. The value of $\frac{2 \tan 60^\circ}{1 - \tan^2 60^\circ}$ is same as the value of 1
- (A) $-\tan 30^\circ$ (B) $-\tan 60^\circ$
(C) $2 \sin 60^\circ$ (D) $2 \cos 60^\circ$
13. Which of the following statements is false ? 1
- (A) Infinite number of tangents can be drawn to a circle.
(B) Infinite number of tangents can be drawn to a circle from a point outside the circle.
(C) Infinite number of secants can be drawn to a circle from a point outside the circle.
(D) Angle between tangent and diameter at point of contact is 90° .
14. In the adjoining figure, PA and PB are tangents to a circle with centre O. The measure of angle APB is 1

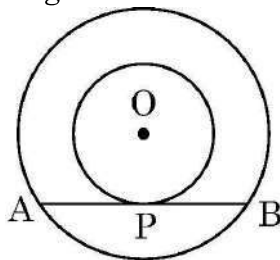


- (A) 210° (B) 150°
(C) 105° (D) 30°



• • •

15. An observer 1.8 m tall stands away from a chimney at a distance of 38.2 m along the ground. The angle of elevation of top of chimney from the eyes of observer is 45° . The height of chimney above the ground is 1
- (A) 38.2 m (B) 36.4 m
(C) 40 m (D) $(38.2)\sqrt{2}$ m
16. In the adjoining figure, the sum of radii of two concentric circles is 16 cm. The length of chord AB which touches the inner circle at P is 16 cm. The difference of the radii of the given circles is 1



- (A) 8 cm (B) 4 cm
(C) 2 cm (D) 3 cm
17. A cone of height 12 cm and slant height 13 cm is surmounted on a hemisphere having radius equal to that of cone. The entire height of the solid is 1
- (A) 17 cm (B) 18 cm
(C) 22 cm (D) 23 cm
18. If x median + y mean = z mode; is the empirical relationship between mean, median and mode, then the value of $x + y + z$ is 1
- (A) 6 (B) 3
(C) 2 (D) 1

Directions : In Question Numbers 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option from following :

- (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 (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.



• • •

19. **Assertion (A) :** For an A.P., 3,6,9, ..., 198, 10th term from the end is 168.

Reason (R) : If 'a' and 'l' are the first term and last term of an A.P. with common difference 'd', then nth term from the end of the given A.P. is $l - (n - 1) d$.

1

20. **Assertion (A) :** For an acute angle θ , $\sec \theta = 3 \Rightarrow \tan \theta = 2\sqrt{2}$.

Reason (R) : $\sec^2 \theta = 1 + \tan^2 \theta$ for all values of θ .

1

SECTION – B

This section has 5 very short answer type questions of 2 marks each.

21. AD and PS are angle bisectors of $\angle A$ and $\angle P$ of triangles ABC and PQR. If $\triangle ABC \sim \triangle PQR$, prove that $\triangle ACD \sim \triangle PRS$.

2

22. All the face cards are removed from the pack of 52 cards and a card is drawn at random from the remaining cards. Find the probability that the card so drawn is

2

(i) a spade.

(ii) not an ace.

23. (a) The cost of 2 kg apples and 1 kg of grapes on a day was found to be ₹ 320. The cost of 4 kg apples and 2 kg grapes was found to be ₹ 600. If cost of 1 kg of apples and 1 kg of grapes is ₹ x and ₹ y respectively, represent the given situation algebraically as a system of equations and check whether the system so obtained is consistent or not.

2

OR

(b) Solve for x and y :

$$\sqrt{2}x + \sqrt{3}y = 5 \text{ and}$$

$$\sqrt{3}x - \sqrt{8}y = -\sqrt{6}$$

2

24. The coordinates of the end points of the line segment AB are A(−2, −2) and B(2, −4). P is the point on AB such that $BP = \frac{4}{7} AB$. Find the coordinates of point P.

2



• • •

25. (a) It is given that $\sin(A - B) = \sin A \cos B - \cos A \sin B$. Use it to find the value of $\sin 15^\circ$. 2

OR

- (b) If $\sin A = y$, then express $\cos A$ and $\tan A$ in terms of y . 2

SECTION – C

This section has 6 short answer type questions of 3 marks each.

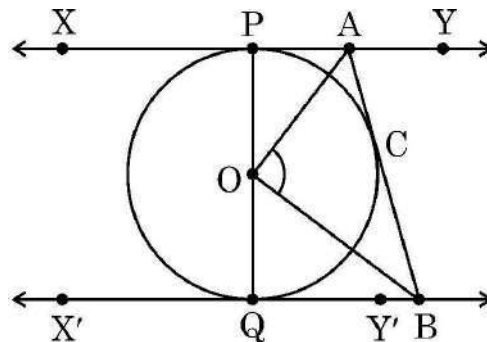
26. (a) Prove the following trigonometric identity : 3

$$\frac{1 + \operatorname{cosec} A}{\operatorname{cosec} A} = \frac{\cos^2 A}{1 - \sin A}$$

OR

- (b) Let $2A + B$ and $A + 2B$ be acute angles such that $\sin(2A + B) = \frac{\sqrt{3}}{2}$ and $\tan(A + 2B) = 1$. Find the value of $\cot(4A - 7B)$. 3

27. In the adjoining figure, XY and $X'Y'$ are parallel tangents to a circle with centre O . Another tangent AB touches the circle at C intersecting XY at A and $X'Y'$ at B . Prove that AB subtends right angle at the centre of the circle; or $\angle AOB = 90^\circ$. 3



28. (a) Prove that $\sqrt{3}$ is an irrational number. 3

OR

- (b) State true or false for each of the following statements and justify in each case : 3
- (i) $2 \times 3 \times 5 \times 7 + 7$ is a composite number.
- (ii) $2 \times 3 \times 5 \times 7 + 1$ is a composite number.



• • •

29. Obtain the zeroes of the polynomial $p(x) = 2x^2 - 5x - 3$. Hence, obtain a polynomial each of whose zeroes is one less than each of the zero of $p(x)$. 3

30. Solve the following system of equations graphically : 3
 $2x + y = 5$ and $4x - y = 7$. Hence, write the coordinates of the points where given lines meet y-axis.

31. Find a relation between x and y such that $P(x, y)$ is equidistant from the points $A(3, 5)$ and $B(7, 1)$. Hence, write the coordinates of the points on x -axis and y -axis which are equidistant from points A and B . 3

SECTION – D

This section has 4 long answer questions of 5 marks each.

32. During a medical checkup, height of 35 students of a class were recorded as follows : 5

Height (in cm)	90-100	100-110	110-120	120-130	130-140	140-150
Number of Students	3	2	4	5	14	7

Find the difference between the mean height and median height.

33. (a) A 2-digit number is seven times the sum of its digits and two (2) more than 5 times the product of its digits. Find the number. 5

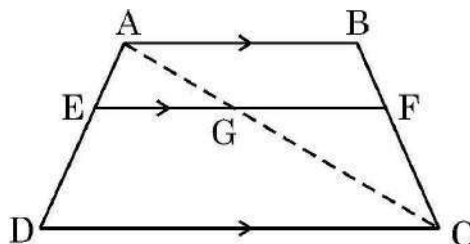
OR

- (b) Find the value(s) of p for which the quadratic equation given as $(p + 4)x^2 - (p + 1)x + 1 = 0$ has real and equal roots. Also, find the roots of the equation(s) so obtained. 5

34. State the converse of basic proportionality theorem. 5

Also find $\frac{BF}{FC}$ in the following figure, given that $AB \parallel DC \parallel EF$ and $\frac{AE}{ED} = \frac{2}{3}$.

Also, find the length of EF if $AB = 10$ cm and $DC = 15$ cm.



• • •

35. (a) From one of the faces of a solid wooden cube of side 14 cm, maximum number of hemispheres of diameter 1.4 cm are scooped out. Find the total number of hemispheres that can be scooped out. Also, find the total surface area of the remaining solid.

5

OR

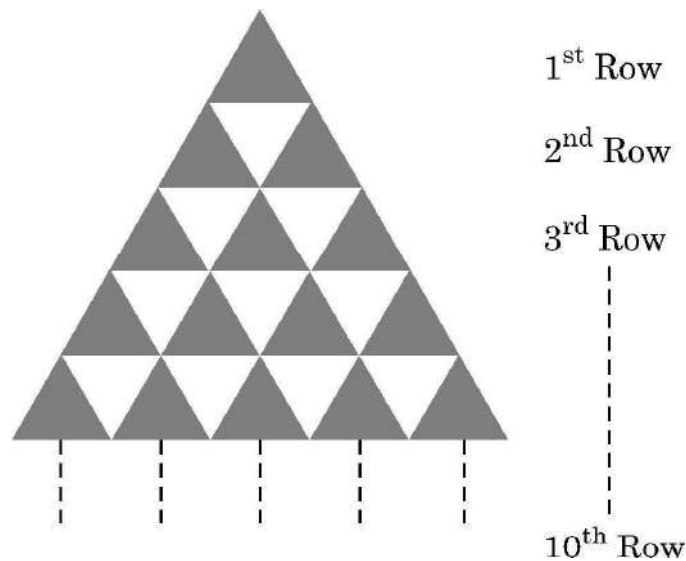
- (b) From a solid cylinder of height 24 cm and radius 5 cm, two cones of height 12 cm and radius 5 cm are hollowed out. Find the volume and surface area of the remaining solid.

5

SECTION – E

This section has 3 case study based questions of 4 marks each.

36. In an equilateral triangle of side 10 cm, equilateral triangles of side 1 cm are formed as shown in the figure below, such that there is one triangle in the first row, three triangles in the second row, five triangles in the third row and so on.



Based on given information, answer the following questions using Arithmetic Progression.

- (i) How many triangles will be there in bottom most row ? 1
 (ii) How many triangles will be there in fourth row from the bottom ? 1
 (iii) (a) Find the total number of triangles of side 1 cm each till 8th row. 2

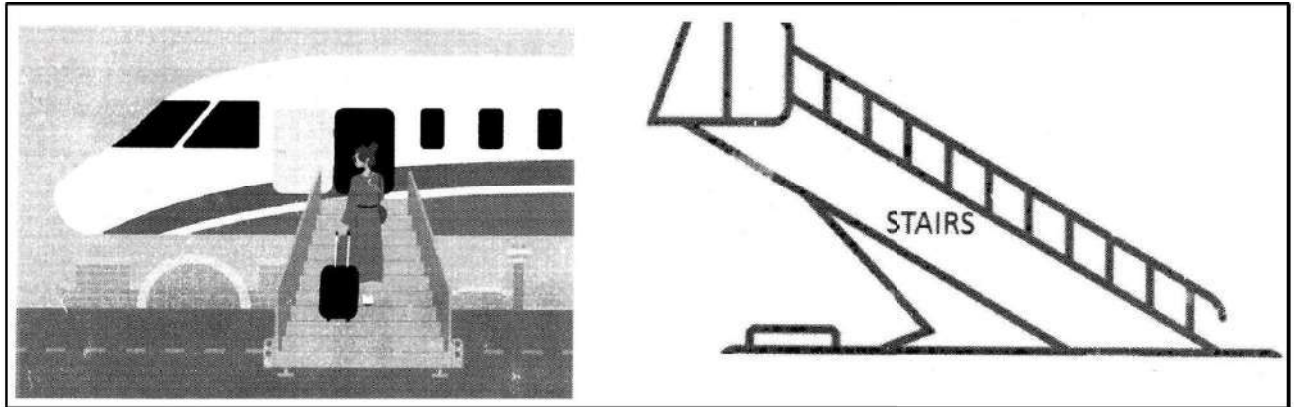
OR

- (iii) (b) How many more number of triangles are there from 5th row to 10th row than in first 4 rows ? Show working. 2



• • •

37. Passenger boarding stairs, sometimes referred to as boarding ramps, stair cars or aircraft steps, provide a mobile means to travel between the aircraft doors and the ground. Larger aircraft have door sills 5 to 20 feet (1 foot = 30 cm) high. Stairs facilitate safe boarding and de-boarding.



An aircraft has a door sill at a height of 15 feet above the ground. A stair car is placed at a horizontal distance of 15 feet from the plane.

Based on given information, answer the questions given in part (i) and (ii).

- (i) Find the angle at which stairs are inclined to reach the door sill 15 feet high above the ground. 1
- (ii) Find the length of stairs used to reach the door sill. 1

Further, answer any **one** of the following questions :

- (iii) (a) If the 20 feet long stairs is inclined at an angle of 60° to reach the door sill, then find the height of the door sill above the ground. (use $\sqrt{3} = 1.732$) 2

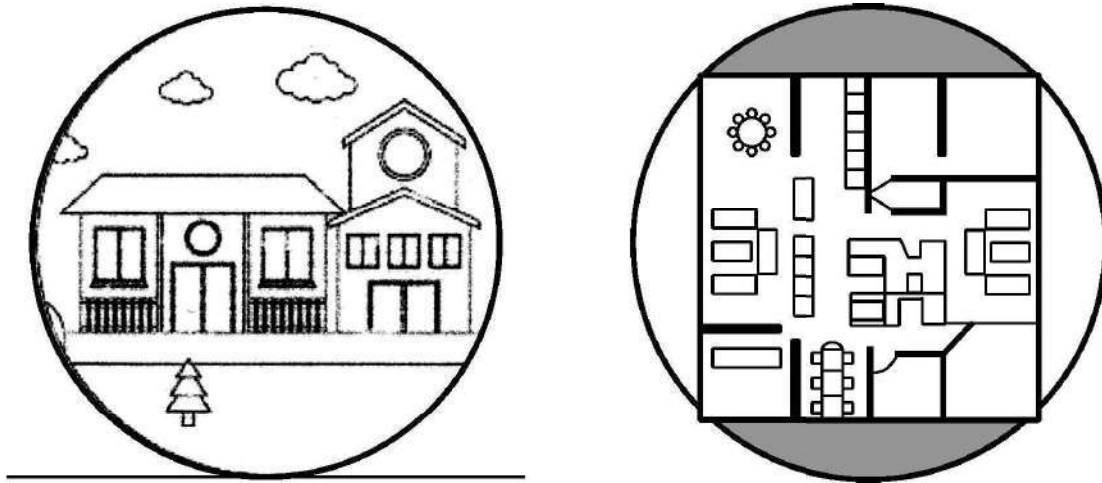
OR

- (iii) (b) What should be the shortest possible length of stairs to reach the door sill of the plane 20 feet above the ground, if the angle of elevation cannot exceed 30° ? Also, find the horizontal distance of base of stair car from the plane. 2



• • •

38. A farmer has a circular piece of land. He wishes to construct his house in the form of largest possible square within the land as shown below.



The radius of circular piece of land is 35 m.

Based on given information, answer the following questions :

- (i) Find the length of wire needed to fence the entire land. 1
- (ii) Find the length of each side of the square land on which house will be constructed. 1
- (iii) (a) The farmer wishes to grow grass on the shaded region around the house. Find the cost of growing the grass at the rate of ₹ 50 per square metre. 2

OR

- (iii) (b) Find the ratio of area of land on which house is built to remaining area of circular piece of land. 2

