PRE-BOARD EXAMINATION (2025-26) **SET-4**

ENGLISH CORE-Code No. 301

CLASS-XII

Time allowed: 3 Hrs. **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 the correct question.
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 passage. **12 Marks**

1.Behavioural scientists have spent a lot of time studying what makes us happy. We know happiness can predict health and longevity, and happiness scales can be used to measure social progress and the success of public policies. But happiness isn't something that just happens to you.

2. Happiness often comes from within. Learn how to tame negative thoughts and approach every day with optimism. Don't try to stop negative thoughts. Telling yourself "I have to stop thinking about this," only makes you think about it more. Treat yourself like a friend. When you are feeling negative about yourself, ask yourself what advice would you give a friend who was down on herself. Now try to apply that advice to you. Socratic questioning is the process of challenging and changing irrational thoughts. Studies show that this method can reduce depression symptoms. The goal is to get you from a negative mind-set to a more positive one.

3. Optimism is part genetic, part learned. Optimism doesn't mean ignoring the reality of a dire situation. After a job loss, for instance, many people may feel defeated and think, "I'll never recover from this." An optimist would acknowledge the challenge in a more hopeful way, saying, "This is going to be difficult, but it's a chance to rethink my life goals and find work that truly makes me happy."

4. Generosity makes people happier. Several studies have found that people who behaved generously were happier compared to people who made selfish decisions. In fact, just thinking about being generous and kind triggers a happiness reaction in our brains.

5. Behaviours and habits we engage in do matter—from gratitude to kindness to mindfulness—and that they can lead to an enduring happiness boost. It is important to choose activities that fit our personality and interests. Activities fit us better when they feel natural, enjoyable, and aligned with our values, rather than driven by guilt or other people's expectations. Choose activities that are virtuous and meaningful, rather than obsessing about feeling good all the time. Hedonism won't necessarily make you happy, even if you feel good in the moment. If we pursue pleasure, it shouldn't be at the expense of living a meaningful life. We also need to pursue a purpose, and practice forgiveness, gratitude, and generosity—those give us a sense of competence, autonomy, and connection, which are core human needs. People who invest more effort into their new habits see greater improvements in their well-being. "People can create for themselves a steady inflow of engaging, satisfying, connecting, and uplifting positive experiences, thereby increasing the likelihood that they remain in the upper range of their happiness potentials," Sheldon and Lyubomirsky.

Answer the following questions based on the passage above.

i. Statement I: Happiness is something that happens to you. **1**

Statement II: Happiness often comes from within.

(a) Both statements are false.

(b) Statement I is false and Statement II is true.

(c) Statement I is true and Statement II is false.

(d) Both statements are true.

ii. Mention two ways by which one can tame negative thoughts, as given in the passage.

(a) _____ (b)_____ **2**

iii. Socratic Questioning- **1**

(1) Reduces depression symptoms

(2) Gives a positive mindset

(3) Makes one generous

(4) Challenges irrational thoughts

A. 1,2 & 3 B. 2&4 C. 1,2,3&4 D. 1,2& 4

iv. Hedonism refers to- **1**

(a)The belief that you are not successful

(b)The belief that pleasure is the most important thing in life

(c) The belief that it is not wrong to achieve happiness through unfair means

(d) The belief that happiness is a temporary emotion

v. The passage emphasizes- **1**

(a) The need for developing activities that fit oneself

(b)The need to be optimistic

(c) The need to create positive experiences for oneself

(d)The need to do surveys on happiness scales

A. 1&2 B. Only 1 C. 1,2,3&4 D. 1,2 &3

vi. The core human needs according to the passage are: **1**

(a) Competence, autonomy, and connection

(b) Generosity and optimism

(c) Forgiveness, gratitude and generosity

(d) Kindness, happiness and positive experiences

vii. How would an optimist deal with a difficult situation? **2**

viii. What does Sheldon and Lyubomirsky opine about happiness? **1**

ix. Assertion (A): It is important to choose activities that fit our personality and interests. **1**

Reason (R): Our activities make us obsessed about feeling good all the time.

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

(b) (A) is true but (R) is not the correct explanation of it.

(c)(A) is false but (R) is true.

(d) Both (A) and (R) are false.

x. After a job loss many people feel defeated. A man with a positive mind would---------- **1**

2. Read the passage given below and answer the questions that follow. **10 Marks**

1. AI-driven tools have made significant strides in analysing speech, text, and facial expressions to identify early signs of mental health disorders. Natural Language Processing (NLP) techniques enable extracting valuable insights from written or spoken words. For example, sentiment analysis can identify nuanced changes in an individual's emotional condition by examining social media posts, chat logs, or written diaries.

2. Moreover, voice analysis can detect alterations in speech patterns, encompassing variations in pitch, tone, and rhythm, which might potentially serve as indicators of anxiety, depression, or other mental health conditions. Facial expression analysis, often coupled with computer vision, can provide insights into an individual's emotional state. AI systems can detect micro-expressions and subtle changes in facial features that may indicate underlying psychological conditions.

3. This technology benefits remote mental health monitoring through video consultations or mobile apps. The current trend in this domain involves advancing AI algorithms capable of discerning and comprehending these subtle indicators with notable precision. As AI systems continue to improve, they hold the potential to provide early warning signs of mental health disorders, allowing for timely intervention and support. Table below highlights specific AI tools used in current mental healthcare.

AI tools used in current mental healthcare

AI tools	Chatbot-based therapy
1.Woebot	-chatbot that provides CBT-based therapy for depression and anxiety. It has been shown to be effective in reducing symptoms of depression and anxiety in clinical trials.
2.Wysa	-chatbot that provides therapy support for a variety of mental health conditions, including depression, anxiety, stress, and loneliness. It uses a combination of CBT, mindfulness, and positive psychology to help users improve their mental health.
3.Talkspace	- online therapy platform connecting patients with licensed therapists through video, text, and audio messaging. It uses AI to match patients with therapists best suited to their needs.
4.BetterHelp	-online therapy platform that connects patients with licensed therapists. It uses AI to match patients with therapists but offers a broader range of therapeutic approaches, including cognitive-behavioral therapy (CBT) and psychodynamic therapy.

Answer the following questions, based on the passage above:

i. Complete the following suitably. **1**

_____techniques enable extracting valuable insights from written or spoken words.

ii. Suppose you are offered undesirable food by a host and you were dumbfounded. How would AI driven tools read your feelings? **1**

(a) voice analysis

(b)facial expression analysis

(c)written or spoken words

(d)social media posts, chat logs

iii. How does technology benefit remote mental health monitoring? Give two modes. **2**

iv) Paragraph 3 contains words- 'precision' and 'potential' **1**

Classify the following sentences as: - 'precision' and 'potential.'

Sentence1: AI systems can warn the signs of depression.

Sentence 2: AI algorithms are capable of telling the effect of sleeping hours on the person correctly.

v) Name an online therapy that is best suited to the patients' needs from the AI tool chart. **1**

vi) List two cognitive behavioral therapies found effective in reducing depression and anxiety from the AI tool chart given. **1**

vii) How do AI systems read facial expressions to link with the person's mind? **2**

viii) Which of the AI tools in the chart uses CBT as well as psychodynamic therapy. **1**

(a)Woebot (b)Wysa (c) Talkspace (d) BetterHelp

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 the Secretary of Vishvas Flats Welfare Association, Delhi-51. **Write a notice** to be circulated to the members of the Association, requesting them to attend a meeting to discuss about the security measures of the flats and appointment of new security guards. (Word limit 50words).

OR

B. You are Babita/ Biman the Secretary of the History Club of your school. **Draft a notice** in not more than 50 words informing the students of class IX and X about a proposed excursion to historical places of your city.

4. Attempt any one of the two, (A) or (B), in about 50 words. 1x4=4

A. You are Suman/Sonu the Head Girl/Boy of New Field School. Your school has decided to celebrate "The Grand Parent's Day" in school. **Draft a formal invitation** to be sent to the grand parents of students of your school giving details of the programme.

OR

B. You are Dr. Shailesh Gupta, an eminent educationist. You have been invited to preside over an Inter Zonal Declamation Competition by Neha, the President of English Literary Club of Government Model Sr. Sec. School Sector 19, Chandigarh. **Write a reply for refusal** of the invitation.

5. Attempt any one of the two, (A) or (B), in 120-150 words. **1x5=5**

A. You are Gargi/Gagan of 22, H-Block, Janakpuri, Delhi. You feel sad to notice that people litter the roads with utter disregard for sanitation and cleanliness. As a responsible citizen, **write a letter to the editor** of a national daily highlighting the need for educational institutions to instill civic responsibility among school children. (120-150 words) You may use the following cues along with your own ideas to compose this letter.

cleanliness drive ……spreading awareness campaigns ……. eco club activities in schools ……volunteer for cleanup ……workshops……seminars

OR

B. Aarohi/Aryan of Hillside Road, Goa, sees the following advertisement in "The City News" and decides to apply for the post of a Marketing Executive. **Write a job application** along with the biodata in 120-150 words to the Personnel Manager, India Book House, Mall Road, Goa. **1x5=5**

INDIA BOOK HOUSE Requires Marketing Executive *Qualification:* *Graduate in Marketing and Sales* *Experience 3-5 years* *Fluency in English and Local language* *Knowledge of basic computer skills* *Job requirement:* *Setting targets and timelines* *Supervising sales*

6. Attempt any one of the two, (A) or (B), in 120-150 words. **1x5=5**

A. You are Vaibhavi/Vaibhav, a student of Class XII. Whenever you are stressed, you listen to music and get relaxed. You strongly believe that music de-stresses you and refreshes your body and mind. Based on your experience, **write an article** on Music as Therapy for a health magazine highlighting the healing power of music. Use the following cues along with your own ideas to compose this article:

music establishes connection with self _music helps in self-expression _comforts body, mind & soul _improves one's mood

OR

B. Cultural Society Brightland Public School, Lucknow organised an adult literacy camp in its neighbourhood. **Write a report** in 120 – 150 words on the camp for your school newsletter. You are Sumati/Shivam, the Secretary of the society. Use the following clues: **1x5=5**

- no. of volunteers
- hours spent in teaching
- location of the class
- chairs, blackboards
- no. of people attending the camp
- benefits

SECTION C LITERATURE (40 marks)

7. Read the following extracts and solve ANY ONE of the given two, (A) or (B). **1x6=6**

A) 'but after the airport's
security check, standing a few yards
away, 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? **1**

(a) Confused and disoriented (b) Nostalgic and longing

(c) Empathetic and understanding (d) Fearful and apprehensive

ii. Complete the following analogy correctly: **1**

She sang like a bird-Simile All I did was smile and smile and smile- _____

iii. Read the following statement and choose the correct option: **1**

(I)The poet had gone through the security check. (II) She did not want to look at her mother.

(a) (I) is true, but (II) is false.

(b) (I) is false, but (II) is true.

(c) Both (I) and (II) are true.

(d) Both (I) and (II) are false.

iv. What childhood fear is the poet referring to? **1**

v. Which of the following rhyme schemes has been employed by the poet in the above stanza? **1**

(a) abababb (b) free verse (c) abc abc (d) aabbaa

vi. 'Pale as a winter's moon' suggests that her face……. **1**

OR

B) Aunt Jennifer's fingers fluttering through her wool
Find even the ivory needle hard to pull
The massive weight of Uncle's wedding band
Sits heavily upon Aunt Jennifer's hand (Aunt Jennifer's Tigers)

i. Which of the following themes is best represented in the given extracts? **1**

(a) The maturity of adulthood

(b) The glory of femininity

(c) Victim of male domination

(d) The superficial beauty

ii. State whether the following statement is TRUE or FALSE with reference to the extract **1**

Aunt Jennifer is nervous and traumatised because of the constraints of her marriage. (True/False)

iii. Complete the following sentence appropriately: **1**

The fingers fluttering through her wool symbolise ……..

iv. The use of the words 'massive weight' creates a powerful image of …… **1**

v. Complete the sentence appropriately. **1**

The feeling evoked in the reader towards Aunt Jennifer is …….

vi. What does the Uncle's character reflect in the poem? **1**

(a) male chauvinism and patriarchy

(b) a man's physical strength

(c) male ego

(d) a male's view of the world

8. Read the following extracts and solve ANY ONE of the given two, (A) or (B). 1X4=4

(A) "The next day, infection flared in the Maharaja's right hand. In four days, it developed into a suppurating sore which spread all over the arm. Three famous surgeons were brought in from Madras. After holding a consultation, they decided to operate. The operation took place. The three surgeons who performed it came out of the theatre and announced, "The operation was successful. The Maharaja is dead." In this manner the hundredth tiger took its final revenge upon the Tiger King." (The Tiger King)

i. What caused the initial health issue faced by the Maharaja in the extract? **1**

ii. What was the outcome of the surgical operation performed on the Maharaja? **1**

(a) The Maharaja fully recovered from the infection.

(b) The operation was successful, but the Maharaja died.

(c) The operation failed, and the infection worsened

(d) The surgeons refused to operate due to the severity of the sore.

iii. What does the phrase "the hundredth tiger took its final revenge" suggest about the Maharaja's death? **1**

(a) The Maharaja was directly killed by a tiger during a hunt.

(b) The Maharaja's obsession with killing tigers symbolically led to his victory.

(c) The hundredth tiger was responsible for infecting the Maharaja's hand.

(d) The surgeons conspired against the Maharaja to avenge the tigers.

iv. Choose the correct figure of speech used in the statement "the operation was successful but the Maharaja is dead"? (Irony/Metaphor) **1**

OR

(B) "If I am able, are you?" Sadao asked. "No," Hana said, "But if you can do it alone..." Sadao hesitated again. "The strange thing is," he said, "that if the man were whole, I could turn him over to the police without difficulty. I care nothing for him. He is my enemy. All Americans are my enemy. And he is only a common fellow. You see how foolish his face is. But since he is wounded…" (The Enemy)

i. What is the "strange thing" Sadao refers to? **1**

(a) Hana's fear of the enemy

(b) His inability to turn in an injured soldier

(c)The soldier's foolish face

(d) His deep concern for an American

ii. Complete the sentence appropriately. **1**

Sadao's claim that "he is my enemy" but also expressing hesitation to hand him over, reflects an inner conflict between _____ and _____.

iii. How does the wounded condition of the American soldier affect Sadao's perception of him? **1**

iv. With reference to Sadao's declaration, "All Americans are my enemies", read the statements given below and choose the option that correctly evaluates Sadao's belief: **1**

Statement 1: Sadao's declaration reflects the nationalistic conditioning prevalent during wartime.

Statement 2: Sadao genuinely hates all Americans and shows no empathy throughout the story. Choose the correct option:

(a) Statement 1 is true but Statement 2 is false.

(b) Statement 1 is false but Statement 2 is true.

(c) Both Statement 1 and Statement 2 are true.

(d) Both Statement 1 and Statement 2 are false.

9. Read the following extracts and solve ANY ONE of the given two, (A) or (B). 1x6=6

(A) The world had, of course, never been very kind to him, so it gave him unwonted joy to think ill of it in this way. It became a cherished pastime for him during many dreary ploddings to think of people he knew who had let themselves be caught in the world's rattrap, and of others who were still circling around the bait. One dark evening, as he trudged along the road, he caught sight of a little gray cottage by the roadside and knocked on the door to ask shelter for the night." (The Rattrap)

i. What does the line reveal about the peddler's outlook towards the world? **1**

(a) He believed in the kindness of strangers.

(b) He was optimistic despite hardships.

(c) He found satisfaction in criticizing the world.

(d) He thought the world was a fair place.

ii. What does the phrase "unwonted joy" imply about the peddler's mindset? **1**

(a) He was joyful but also ashamed of his thoughts.

(b) He was forced to think negatively about the world.

(c) He did not want to enjoy criticizing the world, but he couldn't help it.

(d) He was eager to change his attitude.

iii. The "gray cottage by the roadside" symbolically represent the joyful attitude of the peddler. (True/False) **1**

iv. Do you agree with the peddler's view that the world is like a rattrap? Why or why not? **1**

v. Choose the most relevant idea about the central theme of the story. **1**

(a) The kindness of strangers

(b)The deceptive nature of material temptations

(c) The importance of education

(d) The joy of companionship

vi. Choose the figure of speech used in 'the world's rattrap' (Simile/Metaphor) **1**

OR

(B) "I wish he was an Englishman," someone said on the bus. "Ireland will win the world cup." Little Derek told his mother when Sophie brought him home. Her father was gone to pub to celebrate. "What is this you have been telling", Jansie said, next week. "About what" your Geoff told our Frank you met Danney Casey." This was not an inquisition, just Jansie being nosey. But Sophie was startled "Oh that". Jansie frowned, sensing she was covering. "Yes that–well yes I did". "You never did?" Jansie exclaimed. Sophie glared at the ground. Damn that Geoff, this was a Geoff thing, not a Jansie thing. It was meant to be something special just between them. Something secret. It was not a Jansie thing at all. (Going Places)

i. "Ireland will win the World cup." Who is the speaker? **1**

ii. This was a Geoff thing, not a Jansie thing, because - **1**

(a) Jansie was trustworthy.

(b)She lived in the world of reality.

(c) Her personality was different from Geoff.

(d) Jansie was nosey about things.

Choose the most appropriate combination:

(a) a &b (b) a&d (c) c&d (d)a&d

iii. 'something special just between them' was meant to be- **1**

(a) A secret

(b)something suspicious

(c)a prank

(d) None of the above

iv. Sophie is obsessed about- **1**

(a)Geoff her elder brother

(b) Her Dad who loves to watch football matches.

(c) Her friend Jansie who wants her to be happy

(d) The prodigy Danny Casey

v. Who represents the realistic/practical side of the life in the above extract? **1**

vi. This chapter critically explores the clash between adolescent dreams and the realities of a working-class family, particularly through the character of Sophie. (Ture/False) **1**

10. Answer any five of the following six questions in 40-50 words each. 5x2=10

i) 'The attitude of the villagers was completely changed that day'' Elaborate with reference to the lesson. (The Last Lesson)

ii) How did the swimming instructor build a swimmer out of Douglas? (Deep Water)

iii) In what context do you conclude that Subbu was tailor-made for films? (Poets and Pancakes)

iv) Why do the people who run the roadside stand wait for the squealing of car brakes so eagerly? What is their plea/request? (A Roadside Stand)

v) Gandhi's selfless devotion and charisma won over the lawyers' confidence and ensured their wholehearted participation in the Champaran struggle. Explain. (Indigo)

vi) What are the views of writers like V.S. Naipaul and Lewis Carroll on interviews? (The Interview)

11. Answer any two of the following three questions in 40 -50 words each. 2x2=4

i) How did Tishani Doshi feel about visiting Antarctica? (Journey to the End of the Earth)

ii) How does Zitkala-Sa's experience with the loss of her long hair symbolize her struggle with cultural assimilation? (Memories of Childhood)

iii) Why did Derry return to Mr. Lamb's garden despite opposition? (On the Face of It)

12. Answer any one of the following two questions, in about 120-150 words. 1x5=5

A) As Anees Jung, write a diary entry reflecting on the harsh living conditions of the bangle makers you observed while visiting Mukesh's home in Firozabad, highlighting their struggles.

You may begin like this-
Date, Day, Time
Place: Today, Mukesh took me through Firozabad's……..

OR

B) Imagine you are Pablo Neruda of 'Keeping Quiet. You advise Robert Frost (A Roadside Stand) in the context of his conflict and pain at the plight of the road side stand owners. Pen down your advice in a letter to Robert Frost. You may begin like this-

Dear Robert Frost,

You seem very pained at the plight of the roadside stand owners, and I would like to advise you....

13. Answer any one of the following two questions, in about 120-150 words. 1X5=5

A) Both Charley in The Third Level and Dr. Sadao in The Enemy are faced with difficult choices in their lives. Compare how these characters deal with their internal conflicts and what their decisions reveal about human nature.

OR

B) 'The boy drank the milk of an English cow, was brought up by an English nanny, tutored in English.' (The Tiger king).

You realize that western influence on Indian culture is deep rooted since the days of the Tiger King. Write an article using textual references on the pros and cons of western influence on Indian society. You may begin like this-

Indian's exposure to English language and western influence …….

PREBOARD EXAMINATION-(2025-26)

CLASS: XII

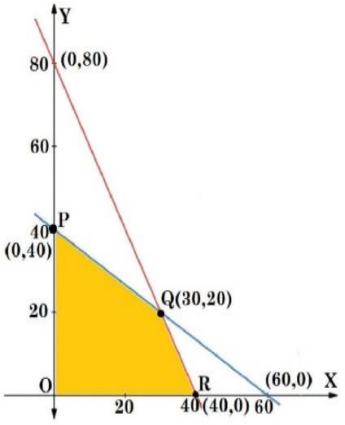
SUBJECT: MATHEMATICS (041)

Time Allowed: 3 Hours **Maximum Marks: 80**

General Instructions:

1. This question paper contains five sections - A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

Q.No.	**SECTION – A** (Multiple Choice Questions) Each question carries 1 mark	Marks
1.	If $\begin{bmatrix} 3p & -6 \\ 1 & 2 \end{bmatrix}$ is a singular matrix, then the value of 'p' is : (a)2 (b)3 (c)0 (d)-1	**1**
2.	If A is a square matrix of order 3 and $\lvert -2A \rvert = k\lvert A \rvert$, the value of k is (a) –8 (b) 8 (c) 4 (d) –4	**1**
3.	The value of λ for which the projection of $\vec{a} = \lambda\hat{\imath} + \hat{\jmath} + 4\hat{k}$ on $\vec{b} = 2\hat{\imath} + 6\hat{\jmath} + 3\hat{k}$ is 4 units : (a) 4 (b) 5 (c) 3 (d) 6	**1**
4.	The function $f(x) = \begin{cases} \frac{\sin x}{x} + \cos x & , x \neq 0 \\ k & , x = 0 \end{cases}$ is continuous at x= 0 , then the value of k is a. 3 b. 2 c. 1 d. 1.5	**1**
5.	The derivative of $\sec(\tan^{-1} x)$ w.r.t x is : (a) $\frac{x}{1+x^2}$ (b) $\frac{1}{\sqrt{1+x^2}}$ (c) $\frac{x}{\sqrt{1+x^2}}$ (d) $x\sqrt{1+x^2}$	**1**

6.	If 'm' and 'n' respectively are the degree and order of the differential equation $\frac{d}{dx}\left[\left(\frac{dy}{dx}\right)^3\right]=0$, then m+n is : (a) 1 (b) 2 (c) 3 (d) 4	**1**
7.	For an L.P.P the objective function is $Z=4x+3y$, and the feasible region determined by a set of constraints (linear inequalities) is shown in the graph Which one of the following is true : (a) Maximum value of Z is at R. (b) Maximum value of Z is at Q. (c) Value of Z at R is less than the value at P. (d) Value of Z at Q is less than the value at R. 	**1**
8.	The area of a parallelogram whose adjacent sides are $\hat{i}-2\hat{j}+3\hat{k}$ and $2\hat{i}+\hat{j}-4\hat{k}$ is : (a) $5\sqrt{3}$ sq. units (b) $10\sqrt{3}$ sq. units (c) $5\sqrt{6}$ sq. units (d) $10\sqrt{6}$ sq. units	**1**
9.	The value of $\int_1^{\sqrt{3}}\frac{1}{1+x^2}dx$ is : (a) $\frac{\pi}{3}$ (b) $\frac{2\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{12}$	**1**
10.	Let A be a square matrix the $A.A^T$ is : (a) Singular matrix (b) symmetric matrix (c) skew-symmetric matrix (d) non-singular matrix	**1**
11.	The value of $\int\frac{(x+1)(x+\log x)^2}{x}dx$ is : (a) $\frac{(x+\log x)^3}{3}+C$ (b) $\frac{(x+\log x)^2}{2}+C$ (c) $\frac{1}{x+\log x}+C$ (d) $\frac{1}{(x+\log x)^2}+C$	**1**
12.	If $\begin{vmatrix}x+1 & x-1\\ x-3 & x+2\end{vmatrix}=\begin{vmatrix}4 & -1\\ 1 & 3\end{vmatrix}$, then the value of x is : (a) 4 (b) 3 (c) 0 (d) 2	**1**
13.	If A is a square matrix of order 3×3 such that $\lvert adj\ A\rvert=25$, then $\lvert A\rvert$ is :	**1**

	(a) 125 (b) 9 (c) 5 (d) $\frac{1}{5}$	
14.	If A and B are two independent events such that $P(A) = 0.4$, $P(B) = p$ and $P(A \cup B) = 0.6$, then the value of 'p' is : (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{1}{5}$	**1**
15.	The corner points of the feasible region determined by the system of linear constraints are $(0,3), (1,1)$ and $(3,0)$. Let $Z = px + qy$, where $p, q > 0$. Conditions on p and q so that the minimum of z occurs at $(3,0)$ and $(1,1)$. (a) $p = 3q$ (b) $2p = q$ (c) $p = 3q$ (d) $p = q$	**1**
16.	If $y = 1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} - \ldots\ldots$ then $\frac{d^2y}{dx^2}$ is equal to (a) $-x$ (b) $-y$ (c) x (d) y	**1**
17.	If 'θ' is the angle between two vectors $\vec{a}$ and $\vec{b}$, then $\lvert\vec{a}.\vec{b}\rvert = \lvert\vec{a}\times\vec{b}\rvert$ when 'θ' is equal to (a) 0 (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{2}$ (d) π	**1**
18.	The direction ratios of the line $4x - 12 = 2y + 4 = 3z - 3$ are (a) 4,6,3 (b) 6,3,4 (c) 4,6,3 (d) 3,6,4	**1**

ASSERTION-REASON BASED QUESTIONS:

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R).

Choose the correct answer out of the following choices.

(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.

19.	**Assertion (A):** The domain of the function $\sec^{-1}(2x+1)$ is $(-\infty, -1] \cup [0, \infty)$. **Reason (R):** $\sec^{-1}\left(-\frac{2}{\sqrt{3}}\right) = \frac{5\pi}{6}$	**1**

20.	**Assertion (A):** The lines $\frac{x-5}{7}=\frac{y+2}{-5}=\frac{z}{1}$ and $\frac{x}{1}=\frac{y}{2}=\frac{z}{3}$ are perpendicular. **Reason (R):** Two lines $\frac{x-x_1}{a_1}=\frac{y-y_1}{b_1}=\frac{z-z_1}{c_1}$ and $\frac{x-x_2}{a_2}=\frac{y-y_2}{b_2}=\frac{z-z_2}{c_2}$ are perpendicular if $a_1a_2+b_1b_2+c_1c_2=0$.	**1**
	SECTION –B (This section comprises of very short answer type questions (VSA) of 2 marks each)	
21.	Find the value of $\sin\left(\frac{\pi}{2}-\sin^{-1}\left(\frac{-\sqrt{3}}{2}\right)\right)$ **OR** Show that the function f: R → R, defined as $f(x) = x^2$, is neither one-one nor onto.	**2**
22.	A particle moves along the curve $6y=x^3+2$. Find the points on the curve at which y-coordinate is changing 8 times as fast as the x-coordinate.	**2**
23.	Evaluate : $\int \sin^3 x\ dx$ **OR** Evaluate : $\int \frac{dx}{e^x+e^{-x}}$	**2**
24.	If $y=500e^{7x}+600e^{-7x}$, then show that $\frac{d^2y}{dx^2}=49y$.	**2**
25.	Find the maximum profit that a company can make, if the profit function is given by $P(x) = 72 + 42x - x^2$, where x is the number of units and P is profit in rupees.	**2**
	SECTION –C **(This section comprises of very short answer type questions (SA) of 3 marks each)**	
26.	Evaluate: $\int \frac{(x-3)}{(x-1)^3}e^x dx$	**3**
27.	A bag contains $(2n+1)$ coins. It is known that $(n-1)$ of these coins have a head on both sides, whereas the rest of the coins are fair. A coin is picked up at random from the bag and is tossed. If the probability that the toss results in a head is $\frac{31}{42}$, determine the value of n. **OR** An electric shop has two types of LED bulbs of equal quantity. The probability of an LED bulb lasting more than 6 months given that it is of type 1 is 0.7 and is given that it is	**3**

	of type 2 is 0.4. Then find the probability that on LED bulb chosen uniformly at random lasts more than 6 months..	
28.	Evaluate $\int_0^{\frac{\pi}{2}} \frac{\cos^2 x}{1+3\sin^2 x} dx$ **OR** Evaluate: $\int_0^{\pi} \frac{x \sin x}{1+\cos^2 x} dx$	**3**
29.	Find the particular solution of the differential equation $(1 + e^{2x})\, dy + (1 + y^2)e^x\, dx = 0$, given that y = 1 when x = 0. **OR** Solve the differential equation $ye^{x/y}\, dx = (x\, e^{x/y} + y^2)dy$ ($y \neq 0$).	**3**
30.	Solve the following Linear Programming Problem graphically: Maximize. Z=4x+y Subject to $x + y \leq 50$; $3x + y \leq 90$; $x, y \geq 0$.	**3**
31.	Evaluate: $\int \frac{x^2+x+1}{(x^2+1)(x+2)} dx$	**3**
	SECTION-D **(This section comprises of long answer type questions (LA) of 5 marks each)**	
32.	Using integration, find the area of the region enclosed between the circle $x^2 + y^2 = 16$ and the lines y = 1 and y = 2 in the first quadrant.	**5**
33.	Show that the relation R defined on the **set N×N** by (a,b) R (c,d) $\Rightarrow a^2 + d^2 = b^2 + c^2$ $\forall$ a, b, c, d $\in$ **N** is an equivalence relation **OR** Show that the relation R on the set $A = \{x \in Z : 0 \leq x \leq 12\}$, given by $R = \{(a,b) : \lvert a-b \rvert$ *is a multiple of* $4\}$ is an equivalence relation. Also write equivalence class $[1]$.	**5**
34.	Use the product $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ to solve the system of equation $x - y + 2z = 1; 2y - 3z = 1 ;\ 3x - 2y + 4z = 2$	**5**

35.	Find the coordinates of the image of the point (2, 3, 4) with respect to the line $\vec{r} = (2\hat{j} + 4\hat{k}) + \gamma(2\hat{i} + 4\hat{j} + \hat{k})$; where γ is a scalar. Also, find the distance of the image from the origin. **OR** If with reference to the right handed system of mutually perpendicular unit vectors $\hat{i}, \hat{j}$ and $\hat{k}$, $\vec{\alpha} = 3\hat{i} - \hat{j}$, $\vec{\beta} = 2\hat{i} + \hat{j} - 3\hat{k}$, then express $\vec{\beta}$ in the form $\vec{\beta} = \vec{\beta}_1 + \vec{\beta}_2$, where $\vec{\beta}_1$ is parallel to $\vec{\alpha}$ and $\vec{\beta}_2$ is perpendicular to $\vec{\alpha}$.	**5**

SECTION-E

This section contains three Case-study / Passage based questions. First two questions have three sub-parts (i), (ii) and (iii) of marks 1, 1 and 2 respectively. Third question has two sub-parts of 2 marks each.

36. **4**

A shopkeeper sells three types of flowers seeds A_1, A_2 and A_3. These are sold as mixture, where their proportions are 4:4:2 respectively. Also their germination rates are 45%, 60% and 35% respectively. Let A_1: seed A_1 is chosen, A_2: seed A_2 is chosen and A_3: seed A_3 is chosen.

Also let E: seed germinates.

(i) Find P(A_1), P(A_2) and P(A_3).

(ii) Write P(E | A_1) +P(E | A_2) + P(E | A_3).

(iii) Calculate the probability of a randomly chosen seed to germinate. Express the answer in %.

OR

(iii) Calculate the probability that seed is of the type A_2 given that a randomly chosen seed does not germinate.

37.	**CASE STUDY II:** Read the following passage and answer the questions given below. A sports stadium is elliptical in shape. The district sports administration wants to design a rectangular football field with the maximum possible area. The football field is given by the graph of $\frac{x^2}{25}+\frac{y^2}{9}=1$. **(i)** If the length and the breadth of the rectangular field be '2x' and '2y' respectively, then find the area function in terms of 'x'. **(ii)** Find the critical point of the function obtained in **(i).** **(iii)** Use first derivative test to find the length '2x' and width '2y' of the soccer field, that will maximize its area. **OR** **(iii)** Use second derivative test to find the length '2x' and width '2y' of the soccer field, that will maximize its area.	**4**
38.	**CASE STUDY III :** Read the following passage and answer the questions given below. An airplane is flying along the line $\vec{r} = \alpha(2\hat{i} + 3\hat{j} + 4\hat{k})$; where α is a scalar and another aeroplane is flying along the line $\vec{r} = (\hat{i} + \hat{j}) + \gamma(3\hat{j} + 2\hat{k})$; where γ is a scalar. (i) At what points on the line should they reach, so that distance between them is shortest (ii) Find the shortest possible distance between them.	**4**

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KENDRIYA VIDYALAYA SANGTHAN DEHRADUN REGION
PRE-BOARD EXAMINATION 2025-26
SUBJECT- PHYSICS
CLASS –XII

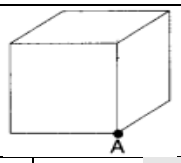
TIME: 3 HOUR **MAXIMUM MARKS: 70**

General Instructions

(1) There are 33 questions in all. All questions are compulsory.
(2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
(3) All the sections are compulsory.
(4) **Section A** contains **sixteen questions, twelve MCQ and four assertion reasoning based of 1 mark each**, **Section B** contains **five questions of two marks each**, **Section C** contains seven questions of three marks each, **Section D** contains **two case study-based questions of four marks each** and **Section E** contains **three long answer questions of five marks each**.
(5) There is no overall choice. However, an internal choice has been provided in two questions in Section B, one question in Section C and all three questions in Section E. You have to attempt only one of the choices in such questions.
(6) Use of calculators is not allowed.
(7) You may use the following values of physical constants where ever necessary
i. c = 3 x 10^8 m/s
ii. me = 9.1 x 10^{-31} kg
iii. mp = 1.7 x10^{-27} kg
iv. e = 1.6 x 10^{-19} C
v. μ0 = 4π x 10^{-7} T m A^{-1}
vi. h = 6.63 x10^{-34} J s
vii. ε0 = 8.854 x10^{-12} $C^2N^{-1}m^{-2}$
viii. Avogadro's number = 6.023 X 10^{23} per gram mole

SECTION-A (MCQ)

Q1 The total flux through the faces of the cube with side of length **a** if charge q is placed at corner A of the cube is — 1 MARK



(a) $\frac{q}{8\varepsilon 0}$ (b) $\frac{q}{4\varepsilon 0}$ (c) $\frac{q}{2\varepsilon 0}$ (d) $\frac{q}{\varepsilon 0}$

Q2 According to Coulomb's law, which is the correct relation for the given figure? — 1 MARK

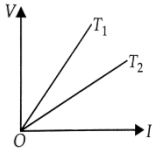
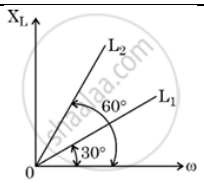
(a) $q_1q_2 > 0$ (b) $q_1q_2 < 0$ (c) $q_1q_2 = 0$ (d)1> $\frac{q_1}{q_2} > 0$

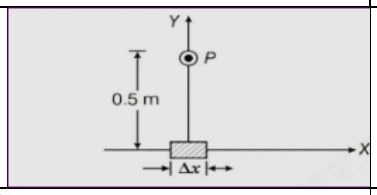
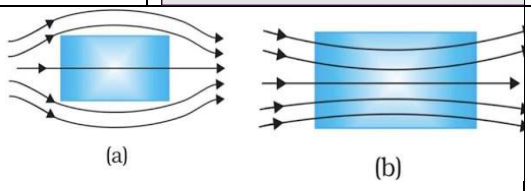
Q3 A straight wire is kept horizontally along east-west direction. If a steady current flows in the wire from east to west, the magnetic field at a point above the wire will point towards — 1 MARK

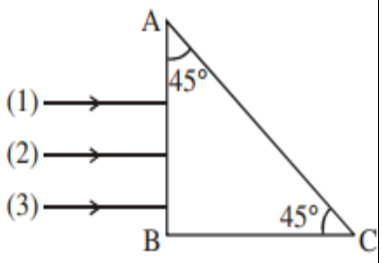
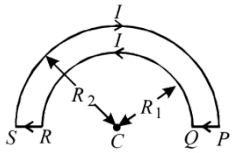
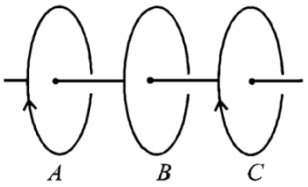
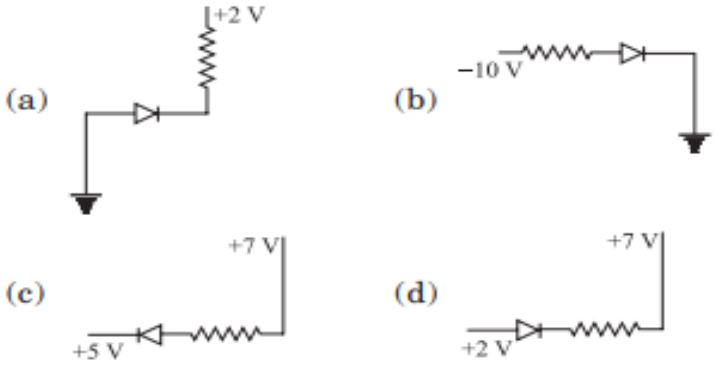
(a) east (b) west (c) north (d) south

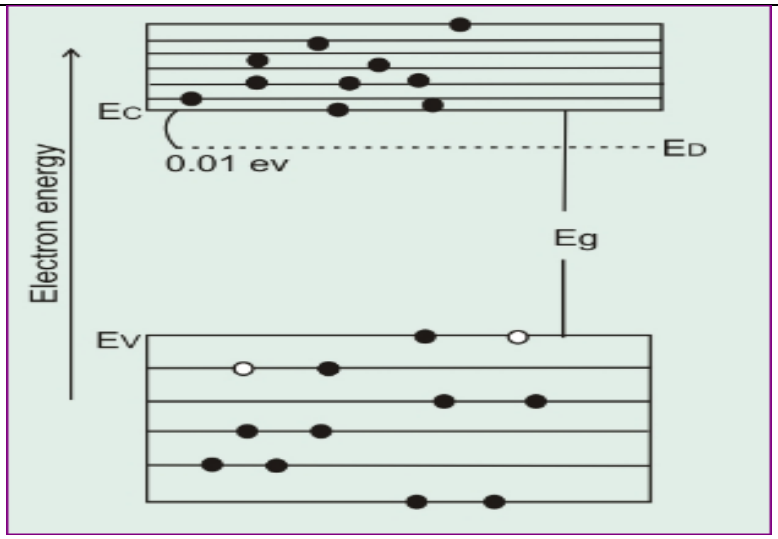
Q4 Two long parallel wires kept 2m apart carry 3A current each, in the same direction. The force per unit length on one wire due to other is — 1 MARK

(a)$4.5 \times 10^{-5} Nm^{-1}$attractive (b) $4.5 \times 10^{-7} Nm^{-1}$repulsive
(c) $9 \times 10^{-7} Nm^{-1}$ attractive (d) $9 \times 10^{-5} Nm^{-1}$ attractive

Q5	The voltage V and current I graphs for a conductor at two different temperatures T_1andT_2 are shown in the figure. The relation between T_1andT_2 is (a) $T_1 > T_2$ (b) $T_1 < T_2$ (c) $T_1 = T_2$ (d) $T_1 = 2T_2$		1 MARK
Q6	The magnetic flux linked with the coil(in weber) is given by the equation $\phi = 5t^2 + 3t + 16$. The induced EMF in the coil at time t=4sec will be (a) -27 V (b) -43 V (c) -108 V (d) 210 V		1 MARK
Q7	Figure shows the variation of inductive reactance X_L of two ideal inductors of inductance L_1 and L_2, with angular frequency ω. L_1/ L_2 is (a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 3 (d) $\frac{1}{3}$		1 MARK
Q8	In the process of charging of a capacitor the current produced between the plate of the capacitor is (a) $\mu_0 \frac{d\phi_E}{dt}$ (b) $\frac{1}{\mu_0}\frac{d\phi_E}{dt}$ (c) $\varepsilon_0 \frac{d\phi_E}{dt}$ (d) $\frac{1}{\varepsilon_0}\frac{d\phi_E}{dt}$		1 MARK
Q9	For a concave mirror of focal length 'f' the minimum distance between the object and its real image is (a) Zero (b) f (c)2f (d)4f		1 MARK
Q10	The coherence of two light sources means that the light waves emitted have (a)Same frequency (b) same intensity (c) constant phase difference (d) same velocity		1 MARK
Q11	The energy of an electron in the ground state of hydrogen atom is -13.6 eV. The kinetic energy and potential energy of the electron in the first excited state will be (a) -13.6eV, 27.2 eV (b) -6.8eV, 13.6eV (c) 3.4eV, -6.8eV (d) 6.8eV, -3.4eV		1 MARK
Q12	Two nuclei have their mass numbers in the ratio of 1:27. What is the ratio of their nuclear densities? (a) 1:27 (b) 1:1 (c)1:9 (d)1:3		1 MARK
	(ASSERTION- REASON)		
	Directions : Each of these questions contain two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below. (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion. (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion (c) Assertion is correct, reason is incorrect (d) Assertion is incorrect, reason is incorrect.		
Q13	**Assertion**- Work done by electric field on moving a positive charge on an equipotential surface is always zero. **Reason**- Electric lines of force are always perpendicular to equipotential surfaces.		1 MARK
Q14	**Assertion**- Propagation of light through an optical fibre is due to total internal reflection taking place at the core-cladding interface. **Reason**- Refractive index of the material of the cladding of the optical fibre is greater than that of the core.		1 MARK
Q15	**Assertion**- In Young's double slit experiment all fringes are of equal width.		1 MARK

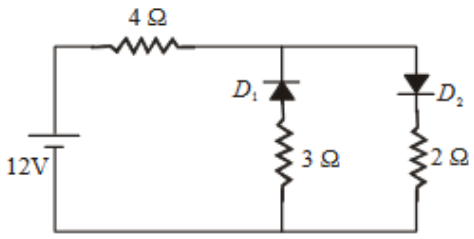
	Reason- The fringe width depends upon wavelength of light (λ) used, distance of screen from plate of slits(D) and slits separation(d).	
Q16	**Assertion**- An alpha particle is moving towards a gold nucleus. The impact parameter is maximum for the scattering angle of 180^0 **Reason**- The impact parameter in an alpha particle scattering experiment does not depend upon the atomic number of the target nucleus.	1 MARK
	SECTION-B (2 MARKS)	
Q17	Four point charges of 1μC, -2μC, 1μC and -2μC are placed at the corners A, B, C, and D respectively, of a square of side 30cm. Find the net force acting on a charge of 4μC placed at the centre of the square.	2 MARKS
Q18	A battery of emf 12V and internal resistance 4Ω is connected to an external resistance R. If the current in the resistance is 0.5A, calculate the value of (a) R, and (b) the terminal voltage of the battery.	2 MARKS
Q19	An element $\overrightarrow{\Delta l} = \Delta x \to 0$ is placed at the origin and carries a large current I = 10 A along X-axis . What is the magnetic field on the y-axis at a distance of 0.5 m. Δx=1cm. **OR** 	2 MARKS
Q19	A uniform magnetic field get modified as shown in figure, when two specimens A and B are placed in it (i) Identify the specimen A and B. (ii) How is the magnetic susceptibility of specimen A is different from that of specimen B. 	2 MARKS
Q20	The voltage between the plates of a parallel plate capacitor of capacitance 1.0μF is changing at the rate of 5 V s^{-1}.What is the displacement current in the capacitor?	2 MARKS
Q21	If light of wavelength 412.5 nm is incident on each of the metals given below, which one will show photoelectric emission and why? <table><tr><th>Metal</th><th>Work Function(eV)</th></tr><tr><td>Na</td><td>1.92</td></tr><tr><td>K</td><td>2.15</td></tr><tr><td>Ca</td><td>3.20</td></tr><tr><td>Mo</td><td>4.17</td></tr></table>	2 MARKS
Q21	**OR** Using Rydberg formula calculate the longest wavelength belonging to Lyman and and shortest wavelength in Balmer series. In which region of hydrogen spectrum do these transitions lie? ($R = 1.0 \times 10^7 m^{-1}$)	2 MARKS
	SECTION-C (3 MARKS)	
Q22	State Kirchhoff's laws. Derive condition for balanced Wheatstone bridge.	3
Q23	Explain the process of formation of 'depletion layer' and 'potential barrier' in a p-n junction region of a diode, with the help of a suitable diagram. Which feature of junction diode makes it suitable for its use as a rectifier?	3 MARKS
Q24	Calculate binding energy per nucleon for $^{56}_{26}Fe$. $M(^{56}_{26}Fe) = 55.934939\ u$, $m_n = 1.008665\ u, m_p = 1.007825\ u$	3 MARKS
Q25	In Young's double slit experiment, the slits S, and S_2 are 3 mm apart and the screen is placed 1.0 m away from the slits. It is observed that the fourth bright fringe is at a distance of 5 mm	3 MARKS

	from the second dark fringe. Find the wavelength of light used.	
Q26	Three rays (1,2,3) of different colours fall normally on one of the sides of an isosceles right angled prism as shown. The refractive index of prism for these rays is 1.39,1.47 and 1.52 respectively. Find which of these rays get internally reflected and which get only refracted from AC. Trace the paths of rays. Justify your answer with the help of necessary calculations. 	3 MARKS
Q27	The wire loop PQRSP formed by joining two semicircular wires of radii R1 and R2 carries a current I as shown. The magnitude of the magnetic induction at the centre C is  **OR**	3 MARKS
Q27	A galvanometer is converted into a voltmeter of range $(0-V)$ volt using a resistor of 9900Ω. If a resistor of 4900Ω is used, the range becomes half, i.e. $(0-V/2)$ volt. Calculate: (a)Resistance of galvanometer (b)Resistance required to convert it into a voltmeter of range(0-2V) volt	3 MARKS
Q28	Three identical closed coils A, B and C are placed with their planes parallel to one another. Coils A and C carry equal currents as shown in fig. Coils B and C are fixed in position and coil A is moved towards B with uniform motion. Is there any induced current in B? If no, give reasons. If yes mark the direction of the induced current in this diagram. 	3 MARKS
	SECTION-D (CASE STUDY)	
Q29	When the diode is forward biased, it is found that beyond forward voltage V = Vk, called knee voltage, the conductivity is very high. At this value of battery biasing for the p-n junction, the potential barrier is overcome, and the current increases rapidly with an increase in forwarding voltage. When the diode is reverse biased, the reverse bias voltage produces a very small current of about a few microamperes which almost remains constant with bias. This small current is a reverse saturation current. Q1-In which of the following figures, the p-n diode is forward biased  Q2-Identify which type of extrinsic semiconductor it is	4 MARKS



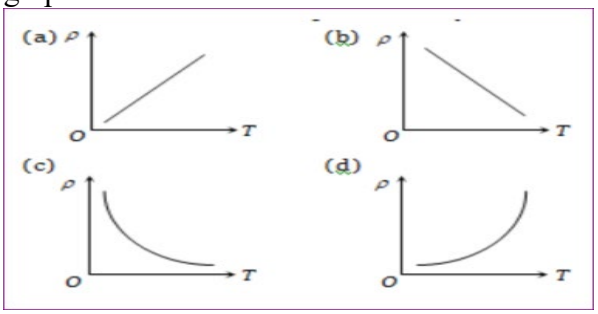
(a) P-type semiconductor (b) n-type semiconductor
(c) intrinsic semiconductor (d) none of these

Q3- The circuit has two oppositely connect ideal diodes in parallel. What is the current following in the circuit

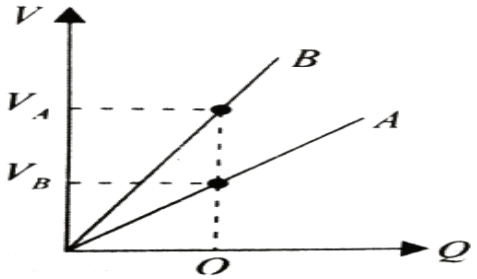


(a) 1.33A (b)1.71A (c) 2.00A (d) 2.31A

Q4-The temperature dependence of resistivity of a semiconductor is represented by which graph



Q30	The concept of 'wave nature of matter' was postulated by de Broglie in 1924. It was confirmed experimentally by Davisson and Germer a few years after its postulation. Therefore, the realization was that 'wave nature' and 'particle nature' can be viewed as the 'two sides of a coin'. Both matter and radiation can exhibit either of these 'natures', depending on the experimental situation. The phenomena of photoelectric effect and the concept of 'matter waves', have been put to very useful and interesting practical applications. We are aware of photocells, automatic doors at shops and malls, automatic light switches that turn on the lights as soon as the intensity drops. Q1. The kinetic energy of the electron orbiting in the first excited state of Hydrogen atom is 3.4eV. Determine the de-Broglie wavelength associated with it. Q2. In what ways are matter waves different from electromagnetic waves?	4 MARKS (2+1+1)

	Q3. A proton and an electron have same kinetic energy. Which of them will have greater de-Broglie wavelength associated with it? Justify.	
	SECTION-F (5 MARKS)	
Q31 (i)	(a) A dielectric slab of thickness t, is introduced between the plates of parallel plate capacitor of area A and separation d (t<d). Find an expression for the capacitance with the dielectric slab. (b) The given graph shows the variation of voltage V across the plates of two capacitors A and B versus increase in charge Q stored in them. Which of the capacitors has higher capacitance? Give reason for your answer  (c) Depict equipotential surfaces due to an electric dipole. **OR**	5 MARKS (3+1+1)
Q31	(a)What is a parallel plate capacitor? Derive an expression for its capacitance. On what factors does the capacitance of a parallel plate capacitor depend? (b)What is electrostatic shielding? (c) Sketch a graph to show how the capacitance C varies with the charge Q given to it.	5 MARKS (3+1+1)
Q32 (i)	(A) Derive lens maker's formula. (B) The radii of curvature of the two surfaces of a concave lens are 20cm each. Find the refractive index of the material of the lens if its power is -5.0 D **OR**	5 MARKS (3+2)
Q32 (ii)	(A) Define angle of deviation in a prism? (B) Obtain the relation A+δ=i+e for a prism where A is the angle of prism, δ is the angle of deviation, i is the angle of incidence and e is the angle of emergence. Write this relation for the minimum deviation? (C) Write the condition for minimum deviation.	5 MARKS (1+3+1)
Q33 (i)	(A) How can a galvanometer be converted to an ammeter? Show required circuit diagram. (B) A galvanometer of resistance 50 Ω is converted into a voltmeter of range (0-2V) using a resistor of 1.0 kΩ. If it is to be converted into a voltmeter of range (0-10V). What will be the value of required resistance for this? (C) What do you mean by figure of merit of a galvanometer? **OR**	5 MARKS (2+2+1)
Q33 (ii)	(a)Explain the principle, and working of an a.c generator. Derive the expression for the induced emf and current. (b)An ac voltage $V_i = 140 \sin(100\pi t)$V is applied to the primary coil having 200 turns , of an ideal transformer and it supplies a power of a 5kW. If the secondary coil has 1000 turns, find (i) the instantaneous voltage across the secondary coil (ii) the current in the secondary coil. (take $\sqrt{2} = 1.4$)	5 MARKS 3+2

केंद्रीय विद्यालय संगठन, देहरादून संभाग
KENDRIYA VIDYALAYA SANGATHAN, DEHRADUN REGION
पूर्व परिषदीय परीक्षा 2025-26 SET-IV
कक्षा : बारहवीं
विषय : हिंदी आधार (302)

निर्धारित समय : 3:00 घंटे अधिकतम अंक – 80

सामान्य निर्देश :

निम्नलिखित निर्देशों को बहुत सावधानी से पढ़िए और उनका पालन कीजिए:-

- इस प्रश्नपत्र में तीन खंड 'क 'ख' और 'ग' हैं।
- खंड 'क' में अपठित बोध पर आधारित प्रश्न पूछे गए हैं। सभी प्रश्नों के उत्तर देना अनिवार्य है।
- खंड 'ख' में पाठ्य पुस्तक अभिव्यक्ति और माध्यम पर आधारित प्रश्न पूछे गए हैं। प्रश्नों में आंतरिक विकल्प दिए गए हैं।
- खंड 'ग' में आरोह भाग 2 एवं वितान भाग 2 पर आधारित प्रश्न पूछे गए हैं । प्रश्नों में आंतरिक विकल्प दिए गए हैं।
- तीनों खंडों के प्रश्नों के उत्तर देना अनिवार्य है।
- यथासंभव तीनों खंडों के प्रश्नों के उत्तर क्रमश: लिखिए।

प्रश्न संख्या	खंड 'क' अपठित बोध	अंक 18
[1]	**निम्नलिखित गद्यांश पर आधारित प्रश्नों के उत्तर दीजिए।**	**(10)**
	दु:ख के वर्ग में जो स्थान भय का है, वही स्थान आनंद-वर्ग में उत्साह का है। भय में हम प्रस्तुत कठिन स्थिति के नियम से विशेष रूप में दु:खी और कभी-कभी उस स्थिति से अपने को दूर रखने के लिए प्रयत्नवान भी होते हैं। उत्साह में हम आने वाली कठिन स्थिति के भीतर साहस के अवसर के निश्चय द्वारा प्रस्तुत कर्म-सुख की उमंग से अवश्य प्रयत्नवान होते हैं। उत्साह से कष्ट या हानि सहने की दृढ़ता के साथ-साथ कर्म में प्रवृत्ति होने के आनंद का योग रहता है। साहसपूर्ण आनंद की उमंग का नाम उत्साह है। कर्म-सौंदर्य के उपासक ही सच्चे उत्साही कहलाते हैं। जिन कर्मों में किसी प्रकार कष्ट या हानि सहने का साहस अपेक्षित होता है उन सबके प्रति उत्कंठापूर्ण आनंद उत्साह के अंतर्गत लिया जाता है। कष्ट या हानि के भेद के अनुसार उत्साह के भी भेद हो जाते हैं। साहित्य-मीमांसकों ने इसी दृष्टि से युद्ध-वीर, दान-वीर, दया-वीर इत्यादि भेद किए हैं। इनमें सबसे प्राचीन और प्रधान युद्धवीरता है, जिसमें आघात, पीड़ा क्या मृत्यु तक की परवाह नहीं	

	रहती। इस प्रकार की वीरता का प्रयोजन अत्यंत प्राचीन काल से पड़ता चला आ रहा है, जिसमें साहस और प्रयत्न दोनों चरम उत्कर्ष पर पहुँचते हैं। केवल कष्ट या पीड़ा सहन करने से साहस में ही उत्साह का स्वरूप स्फुरित नहीं होता। उसके साथ आनंदपूर्ण प्रयत्न या उसकी उत्कंठा का योग चाहिए। बिना बेहोश हुए भारी फोड़ा चिराने को तैयार होना साहस कहा जाएगा, पर उत्साह नहीं। इसी प्रकार चुपचाप, बिना हाथ-पैर हिलाए, घोर प्रहार सहने के लिए तैयार रहना साहस और कठिन-से-कठिन प्रहार सहकर भी जगह से न हटना वीरता कही जाएगी। ऐसे साहस और वीरता को उत्साह के अंतर्गत तभी ले सकते हैं जब कि साहसी या वीर उस काम को आनंद के साथ करता चला जाएगा जिसके कारण उसे इतने प्रहार सहने पड़ते हैं। सारांश यह है कि आनंदपूर्ण प्रयत्न या उसकी उत्कंठा में ही उत्साह का दर्शन होता है, केवल कष्ट सहने के निश्चेष्ट साहस में नहीं। वृति और साहस दोनों का उत्साह के बीच संचरण होता है। दानवीर और अर्थ-त्याग का साहस अर्थात उसके कारण होने वाले कष्ट या कठिनता को सहने की क्षमता अंतर्निहित रहती है। दानवीरता तभी कही जाएगी जब दान के कारण दानी को अपने जीवन-निर्वाह में किसी प्रकार का कष्ट या कठिनता दिखाई देगी। इस कष्ट या कठिनता की मात्रा या संभावना जितनी ही अधिक होगी, दानवीरता उतनी ही ऊँची समझी जाएगी, पर इस अर्थ-त्याग के साहस के साथ ही जब तक पूर्ण तत्परता और आनंद के चिह्न न दिखाई पड़ेंगे तब तक उत्साह का स्वरूप न खड़ा होगा।	
(क)	भय का स्थान किस वर्ग में है? (I) दुख के वर्ग में (II) सुख के वर्ग में (III) क्रोध के वर्ग में (IV) चिंता के वर्ग में	1
(ख)	मृत्यु तक की परवाह किस प्रकार की वीरता में नहीं होती? (I) धर्मवीरता में (II) कर्मवीरता में (III) युद्धवीरता में (IV) दानवीरता में	1
(ग)	निम्नलिखित कथन तथा कारण को ध्यान से पढ़िए तथा सही विकल्प का चयन कीजिए। कथन (A) आनंदपूर्ण प्रयत्न या उसकी उत्कंठा में ही उत्साह का दर्शन होता है। कारण (R) कष्ट सहने के निश्चेष्ट साहस में भी उतना ही उत्साह के दर्शन होते हैं। **विकल्प**	1

	(I) कथन (A)सही है किंतु कारण (R) उसकी सही व्याख्या नहीं है। (II) कथन (A) सही है किंतु कारण (R) उसकी सही व्याख्या करती है। (III) कथन (A) और कारण (R) दोनों सही है । (IV) कथन (A) सही है किंतु कारण (R) गलत है।	
	नीचे लघूत्तरीय प्रश्नों के उत्तर 25-30 शब्दों में दीजिए।	
(घ)	उत्साह के बीच किनका संचरण होता है ?	1
(ङ)	सच्चे उत्साही कौन होते हैं?	2
(च)	उत्साह में किसका योग रहता है ?	2
(छ)	दानवीरता किसे कहा जा सकता है?	2
2.	**निम्नलिखित पद्यांश को पढ़कर दिए गए प्रश्नों के सबसे सटीक विकल्प चुनकर लिखिए :-**	**(08)**
	पथ बंद है पीछे अचल है पीठ पर धक्का प्रबल। मत सोच बढ़ चल तू अभय, ले बाहु में उत्साह-बल। जीवन-समर के सैनिकों संभव असंभव को करो पथ-पथ निमंत्रण दे रहा आगे कदम, आगे कदम। ओ बैठने वाले तुझे देगा न कोई बैठने। पल-पल समर, नूतन सुमन-शय्या न देगा लेटने। आराम संभव है नहीं जीवन सतत संग्राम है बढ़ चल मुसाफिर धर कदम, आगे कदम, आगे कदम। ऊँचे हिमानी श्रृंग पर, अंगार के धु-भृंग पर तीखे करारे खंग पर आरंभ कर अद्भुत सफर ओ नौजवां, निर्माण के पथ मोड़ दे, पथ खोल दे जय-हार में बढ़ता रहे आगे कदम, आगे कदम।	
(क)	इस काव्यांश में कवि किसे प्रेरणा दे रहा है ? (i) मनुष्य को (ii) उत्साह को (iii) सफर को (iv) कवि स्वयं को	1
(ख)	किस पंक्ति का आशय है- जीवन के युद्ध में सुख-सुविधाएँ चाहना ठीक नहीं? (i) पल-पल समर, नूतन सुमन-शय्या न देगा लेटने। (ii) पथ बंद है पीछे अचल है पीठ पर धक्का प्रबल। (iii) जय-हार में बढ़ता रहे आगे कदम।	1

	(iv) उपरोक्त में से कोई नहीं	
(ग)	अद्भुत सफर की अद्भुतता क्या है? निम्नलिखित कथनों पर विचार कीजिए: कथन (i) हिम से ढके पहाड़ों पर चलना कथन (ii) ज्वालामुखी पर शोध करना कथन (iii) तीखे तलवारों पर चलना कथन (iv) अनजाने रास्तों पर चलना विकल्प: (i) केवल कथन (ii) सही हैं l (ii) केवल कथन (i) सही हैं l (iii) केवल कथन (i) और (iii) सही हैं l (iv) केवल कथन (i) और (iv) सही है।	1
	नीचे दिए गए अतिलघूत्तरीय/लघूत्तरीय प्रश्नों के उत्तर 20/25-30 शब्दों में दीजिए।	
(घ)	जीवन सतत संग्राम है'।–कवि ने ऐसा क्यों कहा है?	1
(ङ)	काव्यांश में कवि ने जीवन-समर के सैनिकों को जो संदेश दिया है, उससे आप को क्या सीखना चाहिए?	2
(च)	बढ़ चल मुसाफिर धर कदम, आगे कदम, आगे कदम' इस पंक्ति का आशय स्पष्ट करिए?	2
प्रश्न संख्या	**खंड 'ख'(अभिव्यक्ति और माध्यम पुस्तक पर आधारित प्रश्न)**	**अंक 22**
3.	**दिए गए तीन विषयों में से किसी <u>एक</u> विषय पर 120 शब्दों में एक रचनात्मक लेख लिखिए।** • पटाखे बिन दिवाली • वाहनों की तेज रफ़्तार • मेरे बचपन की न भूलने वाली भूल	**1x6=6**
4.	**निम्नलिखित में से किन्हीं <u>चार</u> प्रश्नों के उत्तर 40 शब्दों में दीजिए।**	**4x2=08**
(क)	समाचार लेखन की उल्टा पिरामिड शैली क्या है ?	2
(ख)	कहानी को नाटक में किस प्रकार रूपांतरित किया जा सकता है? आधार बिन्दुओं का उल्लेख कीजिए।	2
(ग)	सम्पादकीय को अख़बार की आवाज़ क्यों कहा जाता है ?	2
(घ)	स्तम्भ लेखन क्या है?	2
(ङ)	फ्रीलांसर पत्रकार किसे कहते हैं?	2
5.	**निम्नलिखित में से किन्हीं <u>दो</u> प्रश्नों के उत्तर 80 शब्दों में दीजिए।**	**2x4=08**

(क)	विशेष रिपोर्ट किसे कहते हैं?विशेष रिपोर्ट कितने प्रकार की होती हैं?	4
(ख)	साहित्यिक और पत्रकारीय लेखन में क्या अंतर है? समझाकर लिखिए।	4
(ग)	प्रिंट या मुद्रित माध्यम से आप क्या समझते हो? इसकी किन्हीं तीन विशेषताओं का उल्लेख कीजिये?	4
प्रश्न संख्या	**खंड 'ग' (पाठ्यपुस्तक आरोह एवं वितान पर आधारित प्रश्न)**	**अंक (40)**
6.	**निम्नलिखित काव्यांश को पढ़कर नीचे दिए गए पश्नों के सर्वाधिक सटीक विकल्प चुनिए।**	5x1=05
	सुत बित नारि भवन परिवारा । होहिं जाहिं जग बारहिं बारा ॥ अस बिचारि जिय जागहु ताता । मिलइ न जगत सहोदर भ्राता ॥ जथा पंख बिनु खग अति दीना । मणि बिनु फनि करिबर कर हीना ॥ अस मम जिवन बन्धु बिनु तोही । जौ जड़ दैव जियावै मोहीं ॥ जैहों अवध कवन मुँह लाई । नारि हेतु प्रिय भाइ गंवाई ॥ बरु अपजस सहतेउ जग माहीं । नारि हानि विशेष छति नाहीं ।। अब अपलोक शोक सुत तोरा । सहहि निठुर कठोर उर मोरा ॥	
(क)	हमें संसार में दुबारा क्या नहीं मिल सकता? (I) पुत्र (II) भवन (III) भाई (IV) धन दौलत	1
(ख)	लक्ष्मण के बिना राम का जीवन कैसा होगा ? (I) जैसे पंख के बिना पक्षी (II) जैसे मणि के बिना नाग (III) जैसे सूंड के बिना हाथी (IV) उपर्युक्त तीनों	1
(ग)	काव्य पंक्तियों में कौन-सा छंद है ? (I) चौपाई (II) दोहा (III) सोरठा (IV) उपर्युक्त तीनों	1
(घ)	काव्यांश की भाषा कौन सी है ? (I) ब्रज (II) अवधी (III) दोनों	1

	(IV) इनमें से कोई नहीं	
(ङ)	निम्नलिखित कथन- कारण को ध्यानपूर्वक पढ़िए उसके बाद दिए गए विकल्पों में से कोई एक सही विकल्प चुनकर लिखिए – **कथन** – काव्यांश में श्रीराम अयोध्या जाने से संकोच कर रहे थे| **कारण** – श्रीराम को लगता है की लोग व्यंग्य कथन कहेंगे कि पत्नी के लिए भाई गँवा दिया| (I) कथन(A) गलत है तथा कारण(R) सही है। (II) कथन(A) तथा कारण(R) दोनों सही हैं। (III) कथन(A) सही है लेकिन कारण(R) उसकी गलत व्याख्या करता है। (IV) कथन(A) तथा कारण(R) दोनों गलत हैं।	1
7.	**निम्नलिखित प्रश्नों को ध्यानपूर्वक पढ़कर किन्ही <u>दो</u> प्रश्नों के उत्तर 60 शब्दों में लिखिए।**	2x3=06
(क)	'रुबाइयों' के आधार पर घर आँगन में दिवाली और राखी के दृश्य बिम्ब को अपने शब्दों में समझाइए |	3
(ख)	किसी के दुख–दर्द और वेदना को बेचकर कारोबार चलाना और उसकी पीड़ा का मजाक उड़ाना नैतिकता का पतन और मानवीय मूल्यों का हनन है। इस कथन की पुष्टि 'कैमरे में बंद अपाहिज' कविता के संदर्भ में कीजिए।	3
(ग)	'मैं और, और जग और, कहाँ का नाता'- पंक्ति में 'और' शब्द की विशेषता बताते हुए पंक्ति का अर्थ स्पष्ट कीजिए|	3
8.	**निम्नलिखित प्रश्नों को ध्यानपूर्वक पढ़कर <u>किन्ही दो</u> प्रश्नों के उत्तर 40 शब्दों में लिखिए।**	2x2=04
(क)	'उषा' कविता ग्रामीण परिवेश का गतिशील चित्रण है। स्पष्ट कीजिए?	2
(ख)	'विप्लव के बादल की घोर गर्जना का धनी और शोषक वर्ग पर क्या प्रभाव पड़ता है?	2
(ग)	रचना कर्म में विचारों के अंधड़ की क्या भूमिका है? 'छोटा मेरा खेत' कविता के आधार पर स्पष्ट कीजिए।	2
9.	**निम्नलिखित काव्यांश को पढ़कर नीचे दिए गए प्रश्नों के सर्वाधिक सटीक विकल्प चुनिए।**	5x1=05
	मै सोचता हूँ कि पुराने की यह अधिकार लिप्सा क्यों नही समय रहते सावधान हो जाती ? जरा और मृत्यु , ये दोनों ही जगत के अति परिचित और अतिप्रामाणिक सत्य है । तुलसीदास ने अफ़सोस के साथ इनकी सच्चाई पर मुहर लगाई थी – 'धरा को प्रमान यही तुलसी जो फरा सो झरा, जो बरा सो बुताना|' मै शिरीष के फूलों को देख कर कहता हूँ कि क्यों नहीं फलते ही समझ लेते बाबा कि झड़ना निश्चित है! सुनता कौन है ? महाकाल देवता सपासप कोड़े चला रहे हैं, जीर्ण और दुर्बल झड़ रहे हैं, जिनमें प्राणकण थोड़ा भी उर्ध्वमुखी है, वे टिक जाते हैं। दुरंत प्राणधारा और सर्वव्यापक कालाग्नि का संघर्ष निरंतर चल रहा है। मूर्ख समझते है कि जहाँ बनें है, वहीं देर तक बने रहें तो कालदेवता की आँख बचा जाएँगे । भोले	

	हैं वे । हिलते -डुलते रहो, स्थान बदलते रहो, आगे की ओर मुँह किए रहो तो कोड़े की मार से बच भी सकते हो, जमें कि मरे।	
(क)	इस संसार का अटल सत्य क्या है ? (I) धीरे-धीरे मृत्यु की ओर अग्रसर होना (II) जलकर मृत्यु को प्राप्त होना (III) बूढ़ा होना और मृत्यु को प्राप्त होना (IV) विद्यालय जाना और पढ़ाई करना	1
(ख)	शिरीष के फल कैसे होते हैं ? (I) अत्यंत स्वादिष्ट (II) अत्यंत कठोर (III) कोमल और स्वादिष्ट (IV) शिरीष में फल नहीं लगता	1
(ग)	संसार में निरंतर संघर्ष किसके बीच चल रहा है ? (I) मानव और दानव (II) गरीबी और अमीरी (III) जीवन और मृत्यु (IV) यम और देवता	1
(घ)	'धरा को प्रमाण यही तुलसी जो फरा सो झरा, जो बरा सो बुताना|- इस कथन को – (I) तुलसीदास ने बड़े अफ़सोस के साथ कहा क्योंकि वे मृत्यु से डरते थे। (II) तुलसीदास ने बड़े गर्व के साथ कहा क्योंकि वे मृत्यु से डरते नहीं थे। (III) तुलसीदास ने अपनी मृत्यु के समय कहा था| (IV) तुलसीदास ने बड़े अफ़सोस के साथ कहा क्योंकि वे मृत्यु के सत्य को जानते थे|	1
(ङ)	पाठ और लेखक के सही मेल का विकल्प चुनकर लिखिए (I) शिरीष के फूल – जैनेन्द्र कुमार (II) शिरीष के फूल – हजारी प्रसाद द्विवेदी (III) पतंग –रघुवीर सहाय (IV) शिरीष के फूल – फणीश्वर नाथ रेणु	1
10.	**निम्नलिखित प्रश्नों को ध्यानपूर्वक पढ़कर किन्ही दो प्रश्नों के उत्तर 60 शब्दों में लिखिए।**	2x3=06
(क)	'जाति प्रथा और श्रम विभाजन' पाठ में लेखक द्वारा बताये गए आदर्श समाज के तीन तत्वों का उल्लेख कीजिए ।	3

(ख)	बाज़ार का जादू चढ़ने और उतरने पर मनुष्य पर क्या -क्या असर पड़ता है?	3
(ग)	जीजी ने त्याग और दान के बारे में ऋषि-मुनियों की बात को तर्क के साथ प्रमाणित किया? 'काले मेघा पानी दे' पाठ के आधार पर उत्तर दीजिए|	3
11.	**निम्नलिखित प्रश्नों को ध्यानपूर्वक पढ़कर किन्ही दो प्रश्नों के उत्तर 40 शब्दों में लिखिए।**	**2x2=04**
(क)	गाँव में महामारी फैलने और अपने बेटों के देहांत के बावजूद लुट्टन पहलवान ढोल क्यों बजाता रहा ?	2
(ख)	शिरीष के फूल पाठ से आपको क्या प्रेरणा मिलती है?	2
(ग)	भक्तिन का दुर्भाग्य भी कम हठी नहीं था, लेखिका ने ऐसा क्यों कहा होगा? लेखिका के इस कथन के संदर्भ में अपना विचार व्यक्त कीजिए।	2
12.	**निम्नलिखित प्रश्नों को ध्यानपूर्वक पढ़कर किन्ही दो प्रश्नों के उत्तर 100 शब्दों में लिखिए।**	**2x5=10**
(क)	'अतीत में दबे पाँव' पाठ में सिन्धु सभ्यता के सबसे बड़े नगर 'मुअनजोदड़ो' की नगर योजना आज की नगर योजनाओं से किस प्रकार बेहतर थी? उदाहरण सहित लिखिए|	5
(ख)	यशोधर बाबू एक ओर तो अपने बच्चों की तरक्की से खुश होते है वहीं कुछ 'समहाउ इम्प्रोपर' भी अनुभव करते हैं, ऐसा क्यों? पाठ 'सिल्वर वेडिंग' के आधार पर स्पष्ट कीजिए ।	5
(ग)	'जूझ' कहानी में लेखक ने क्या संदेश दिया है? क्या लेखक अपने उद्देश्य में सफल रहा है? 'जूझ' पाठ के संदर्भ में अपने विचार लिखिए।	5
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Pre-Board Exam (2025-26)

Class- XII

Time- 3 Hours **Subject -Computer Science (083)** **MM- 70**

Instructions:

This question paper contains 37 questions.
All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
The paper is divided into 5 Sections- A, B, C, D and E.
Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
Section C consists of 3 questions (29 to 31). Each question carries 3 Marks.
Section D consists of 4 questions (32 to 35). Each question carries 4 Marks.
Section E consists of 2 questions (36 to 37). Each question carries 5 Marks.
All programming questions are to be answered using Python Language only.
In-case of MCQ, text of the correct answer should also be written.

Q. N.	Question	Marks
	SECTION A (21 x 1 = 21 Marks)	
1	State True or False: "tuple() function can be used to convert a sequence into tuple data type."	1
2	Which of the following SQL commands is not covered under DML? a. update b. delete c. drop d. insert	1
3	Consider the given expression: not ((True and False) or True) Which of the following will be correct output if the given expression is evaluated? a. True b. False c. None d. Null	1

4	Select the correct output of the code:
	>>> s='mail2kv@kvsangathan.kvs.in'
	>>> s=s.split('kv')
	>>> op = s[0] + "@kv" + s[2]
	>>> print(op)
	a. mail2@kvsangathan b. mail2@sangathan.
	c. mail2@kvsangathan. d. mail2kvsangathan.
		1

5	Which of the following commands will remove the entire database from MYSQL? a. DELETE DATABASE b. DROP DATABASE c. REMOVE DATABASE d. ALTER DATABASE	1
6	Mohit visited a computer lab of his previous school after 20 years and found that the wires from all the computer systems were connected to a managed switch. Which topology has been used in that lab? a. Graph b. Star c. Tree d. Mesh	1

7	Which of the following statement(s) would give an error after executing the following code? D={'rno':32,'name':'Ms Archana','subject':['hindi','english','cs'],'marks':(85,75,89)}#S1 print(D) #S2 D['subject'][2]='IP' #S3 D['marks'][2]=80 #S4 print(D) #S5 a. S1 b. S3 c. S4 d. S3 and S4	1
8	Which of the following operations on a string will generate an error? a. "PYTHON"*2 b."PYTHON" + "10" c."PYTHON" + 10 d. "PYTHON" + "PYTHON"	1
9	Write the output:- myTuple = ("John", "Peter", "Vicky") x = "#".join(myTuple) print(x) a. #John#Peter#Vicky b.John#Peter#Vicky c. John#Peter#Vicky# d. #John#Peter#Vicky#	1
10	Study the following program and select the possible output(s). import random X= random.random() Y= random.randint(0,4) print(int(X),":",Y+int(X)) a. 0 : 0 b. 1 : 6 c. 2 : 4 d. 0 : 3	1
11	The device used to amplify the transmitted signal in a network is _____. a. modem b. repeater c. gateway d. switch	1

12	Predict the output of the Python code given below:
	value = 50
	def display(N):
	global value
	value = 25
	if N%7==0:
	value = value + N
	else:
	value = value - N
	print(value, end="#")
	display(20)
	print(value)
	a. 50#5 b. 50#25 c. 25#5 d. 25#50
		1

13	State whether the following statement is True or False: An exception in a program arises only when the user does not provide correct input.	1
14	Which of the following statements is FALSE about a relational database? a. A column can contain more than one values. b. The ordering of rows in a relation is immaterial. c. Column names in a relation should be unique. d. Primary key in a relation can comprise of more than one column.	1

15	In case of _____ switching the data is divided into equal size packets and then transmitted via communication channel.	1
16	What will be the output of the following Python statement: print(10-3**2**2+144/12)	1
17	What will be the output of the following Python code? try: x = 10 / 0 except Exception: print("Some other error!") except ZeroDivisionError: print("Division by zero error!") a) Division by zero error! b) Some other error! c) ZeroDivisionError d) Nothing is printed	1
18	What will be the output of the following Python code? str= "Soft Skills" print(str[-3::-3]) a) lSf b) Stkl c) StKi d) l	1
19	In SQL, a relation consists of 5 columns and 6 rows. If 2 columns and 3 rows are added to the existing relation, what will be the updated degree of a relation? a) Degree: 7 b) Degree: 8 c) Degree: 9 d) Degree: 6	1
	Q20 and 21 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True	
20	Assertion (A): A primary key must be unique and cannot have NULL values. Reasoning (R): The primary key uniquely identifies each row in the table.	1
21	Assertion (A): In binary files, the data is stored in the file in the same format as it is stored in the memory. Reason (R): A special newline character is used to mark the end of each line in a binary file.	1
	SECTION B (7 X 2 = 14 Marks)	
22	Differentiate between mutable and immutable data type in python. Give one example of each. OR Explain the difference between while loop and for loop in python with suitable example.	2

23	Vivek has written a code to input a number and check whether it is even or odd number. His codeis having errors. Rewrite the correct code and underline the corrections made.
	Def checkNumber(N):
	status = N%2
	return
	#main-code
	num=int(input(Enter a number to check :))
	k=checkNumber(num)
	if k = 0:
	print(“This is EVEN number”)
	else:
	print(“This is ODD number”)
		2

24	Write the Python statement for each of the following tasks using BUILT-IN functions/ methods only:
	(i) To add an element 20 at the end of the list L1.
	(ii) To print the list of all words in a string called ESSAY.
	OR
	Predict the output of the Python code given below:
	`def Diff(N1,N2):`
	`  if N1>N2:`
	`  return N1-N2`
	`  else:`
	`  return N2-N1`
	`NUM= [10,23,14,54,32]`
	`for CNT in range (4,0,-1):`
	`  A=NUM[CNT]`
	`  B=NUM[CNT-1]`
	`  print(Diff(A,B),'#', end=' ')`
		1+1= 2

25	Write a function countAll(PLACES) in Python, that takes the dictionary, PLACES as an argument and displays the names of the places that start with a vowel. For example, Consider the following dictionary PLACES={1:"India",2:"Paris",3:"China",4:"Osaka",5:"Dhaka"} The output should be: India Osaka **OR** Write a function, CutWords(TUP), that takes a tuple of string as argument and returns a list containing the string with their first character removed. For example, if the tuple is ("Mohit", "Paras", "Hamid", "Sujata"), the list will be ["ohit", "aras", "amid", "ujata"]	2

26	Predict the output of the Python code given below:
	`data=["L",20,"M",40,"N",60]`
	`times=0`
	`alpha=""`
	`add=0`
	`for c in range(1,6,2):`
	`  times = times + c`
	`  alpha = alpha + data [c-1] + "@"`
	`  add = add + data[c]`
	`  print (times, add, alpha)`
		2

27	Rajshri has just created a table named "Library" containing the columns book_id, name, price, publisher. After creating the table, she realized that she has assigned int data type to price but many books have price in decimal. Help her in writing an SQL command to change the data type of price column. Thereafter, write the command to delete the record having book_id as 1003.	2

	OR Kushal is working in a database named EDUCATION, in which he has created a table named "Exam". After successfully creating the table, he now wants to add a new column named Remarks of data type string in the table and also wants to make the existing column named exam_id as primary key. Help him write the commands to complete both the tasks.	
28	(i) Expand the following terms: SMTP , VoIP (ii) Give one difference between Hub and Switch. OR (i) Define the term protocol with respect to networks. (ii) What is the role of gateway in a network?	1+1=2
	SECTION C (3 X 3 = 9 Marks)	
29	Write a function in Python to read a text file, "Assembly.txt"and display those words which begin with the character 'w'. **OR** Write a function, UpperCount() in Python that counts and displays total number of uppercase characters used in the text file named "Clips.txt".	3
30	A list contains following record of a student as list elements: [StudentName, MobileNumber, Class, Section] Write the following user defined functions to perform given operations on the stack named 'xiia': (i) pushElement() - To Push an object containing name and mobile number of students who belong to class xii and section 'a' to the stack (ii) popElement() - To Pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack. For example: If the lists of students details are: ["Rajveer", "99999999999","XI", "B"] ["Swatantra", "8888888888","XII", "A"] ["Sajal","7777777777","VIII","A"] ["Yash", "1010101010","XII","A"] The stack "xiia" should contain ["Swatantra", "8888888888"] ["Yash", "1010101010"] The output should be: ["Yash", "1010101010"] ["Swatantra", "8888888888"] Stack Empty	3

31	Predict the output of the Python code given below:
	s="Welcome2kv"
	n = len(s)
	m=""
	for i in range(0, n):
	if (s[i] >= 'a' and s[i] <= 'm'):
	m = m +s[i].upper()
	elif (s[i] >= 'n' and s[i] <= 'z'):
	m = m +s[i-1]
	elif (s[i].isupper()):
	m = m + s[i].lower()
		3

```
    else:
        m = m +'#'
print(m)
```

OR

Predict the output of the following Python code:

```
wildlife_sanctuary = ["Kaziranga", "Ranthambhore", "Jim Corbett", "Sundarbans", "Periyar",
"Gir", "Bandipur"]
output = [ ]
for sanctuary in wildlife_sanctuary:
    if sanctuary[-1] in 'aeiou':
        output.append(sanctuary[0].upper())
print(output)
```

SECTION D (4 X 4 = 16 Marks)

32 Consider the table SALES as given below: 4

Sales_id	Customer_name	Product	Quantity_sold	price
S001	John Doe	Laptop	5	50000
S002	Jane Smith	Smartphone	10	30000
S003	Michael Lee	Tablet	3	15000
S004	Sarah Brown	Headphone	7	2000
S005	Emily Davis	Smartwatch	8	8000
S006	David	Smartwatch	3	16000
S007	Mark	Tablet	5	34000

A. Write the following queries:

I. To display the total quantity sold for each product whose total quantity sold exceeds 10.

II. To display the records of SALES table sorted by Product name in descending order.

III. To display the distinct Product names from the SALES table.

IV. To display the records of customers whose names end with the letter 'e'.

OR

B. Predict the output of the following:

I. SELECT * FROM Sales where product='Tablet';

II. SELECT sales_id, customer_name FROM Sales WHERE product LIKE 'S%';

III. SELECT COUNT(*) FROM Sales WHERE product in ('Laptop', 'Tablet');

IV. SELECT AVG(price) FROM Sales where product='Tablet';

33 Rohan is making a software on “Countries & their Capitals” in which various records are to be stored/retrieved in CAPITAL.CSV data file. It consists some records (Country , Capital). Help him to define and call the following user defined functions with appropriate values: 4

(i) AddNewRec(Country,Capital) – To accept and add the records to a CSV file “CAPITAL.CSV”. Each record consists of a list with elements as Country and Capital to store country name and capital name respectively.

(ii)ShowRec() – To display all the records present in the CSV file named ‘CAPITAL.CSV’

34 Consider the following tables BOOKS and ISSUED in a database named “LIBRARY”. Write SQL commands for the statements (i) to (iv). 1*4= 4

Table: BOOKS

BID	BNAME	AUNAME	PRICE	TYPE	QTY
COMP11	LET US C	YASHWANT	350	COMPUTER	15
GEOG33	INDIA MAP	RANJEET P	150	GEOGRAPHY	20
HIST66	HISTORY	R BALA	210	HISTORY	25

COMP12	MY FIRST C	VINOD DUA	330	COMPUTER	18
LITR88	MY DREAMS	ARVIND AD	470	NOBEL	24

Table: ISSUED

BID	QTY_ISSUED
HIST66	10
COMP11	5
LITR88	15

(i) Display book name and author name and price of computer type books.

(ii) To increase the price of all history books by Rs 50.

(iii) Show the details of all books in ascending order of their qty issued.

(iv) To display book id, book name and quantity issued for all books which have been issued.

OR

To display the Cartesian Product of the two tables.

35 Rajesh wants to write a program in Python to delete a record of book from the table named Book having book_id as primary key in MYSQL database, LIBRARY. Note the following to establish connectivity between Python and MySQL: — 4

a. Username - root
b. Password - admin
c. Host – localhost

The value of book_id has to be accepted from the user. Help him to write the program in Python.

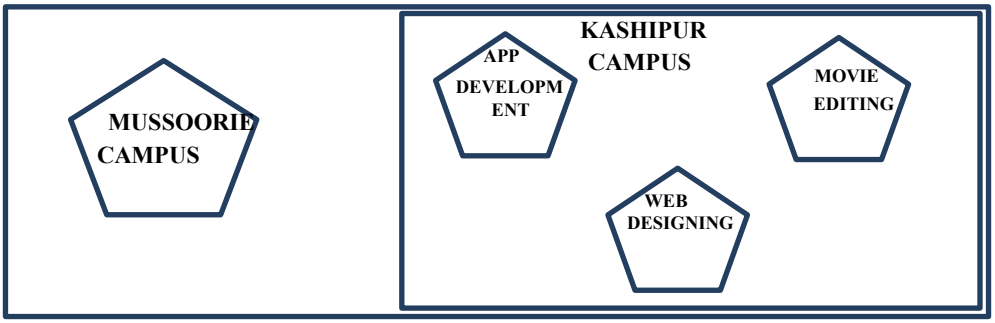
SECTION E (2 X 5 = 10 Marks)

36 Mr. Ramesh, a manager at a software company, needs to maintain records of employees. Each record should include: Employee_ID, Employee_Name, Department and Salary. Write the Python functions to: — 2+3 = 5

I. Input employee data and append it to a binary file.

II. Update the salary of employees in the "IT" department to 200000.

37 MakeInIndia Corporation, an Uttarakhand based IT training company, is planning to set up training centres in various cities in next 2 years. Their first campus is coming up in Kashipur district. At Kashipur campus, they are planning to have 3 different blocks for App development, Web designing and Movie editing. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters. — 1*5=5



Distance between various blocks/locations:

Block	Distance
App development to Web designing	28 m
App development to Movie editing	55 m
Web designing to Movie editing	32 m
Kashipur Campus to Mussoorie Campus	232 km

Number of computers

Block	Number of Computers
App development	35
Web designing	50
Movie editing	80

(i) Suggest the most appropriate block/location to house the SERVER in the Kashipur campus (out of the 3 blocks) to get the best and effective connectivity. Justify your answer.

(ii) Suggest a device/software to be installed in the KashipurCampus to take care of data security.

(iii) Suggest the best wired medium and draw the cable layout (Block to Block) to economically connect various blocks within the Kashipur Campus.

(iv) Suggest the placement of the following devices with appropriate reasons:

a. Switch / Hub
b. Repeater

(v) Suggest a protocol that shall be needed to share program and database files between Kashipur Campus and MussoorieCampus.

OR

What is the use of VoIP?

PRE-BOARD EXAMINATION (2025-26)

CLASS - XII

Time: 3 hours **SUBJECT : CHEMISTRY (043)** **MM-70**

GENERAL INSTRUCTIONS:

Read the following instructions carefully.

(a) There are 33 questions in this question paper with internal choice.

(b) SECTION A consists of 16 multiple-choice questions carrying 1 mark each.

(c) SECTION B consists of 5 short answer questions carrying 2 marks each.

(d) SECTION C consists of 7 short answer questions carrying 3 marks each.

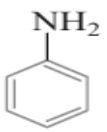
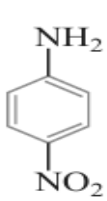
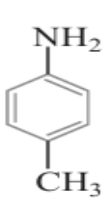
(e) SECTION D consists of 2 case-based questions carrying 4 marks each.

(f) SECTION E consists of 3 long answer questions carrying 5 marks each.

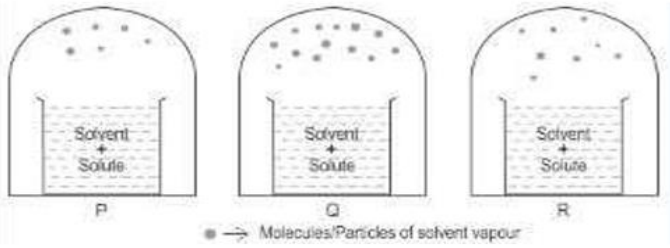
(g) All questions are compulsory.

(h) Use of log tables and calculators is not allowed.

Q. NO.	QUESTION	MARKS
	SECTION A **Questions no.1 to 16 are Multiple Choice type Questions, Carrying 1 mark each.**	
1.	In the reaction, A → B the rate of reaction increases two times on increasing the concentration of A four times, the order of reaction is (A) 2 (B) 0 (C) ½ (D) 3	1
2.	Which substance is used to determine the hardness of water using a simple titration? (A) Mg(EDTA) (B) Fe(EDTA) (C) Na_2(EDTA) (D) Co(EDTA)	1
3.	Which of the following compounds will give brisk effervescence of CO_2 on treatment with $NaHCO_3$? (A) Phenol (B) Acetic acid (C) both (D) None of these	1
4.	The half-life of a first order reaction is 69.35 sec. The value of rate constant of the reaction is (A) 1.0 s^{-1} (B) 0.1 s^{-1} (C) 0.01 s^{-1} (D) 0.001 s^{-1}	1

5.	Which of the following can be used for the preparation of 1-chloropropane? (A) Propene and HCl in the presence of peroxide (B) Propene and HCl in the absence of peroxide (C) Propene and Cl_2 followed by treatment with aqueous KOH (D) Propan-1-ol and $SOCl_2$/pyridine	1
6.	Actinoids exhibit greater number of oxidation states than lanthanoids. The main reason being (A) more energy difference between 5f and 6d than between 4f and 5f orbitals (B) 4f orbitals are more diffused than the 5f orbitals (C) lesser energy difference between 5f and 6d than between 4f and 5d orbitals (D) more reactive nature of the actinoids than the lanthanoids.	1
7.	Which of the following reactions will not result in the formation of carbon-carbon bond? (A) Friedel-Crafts acylation (B) Wurtz reaction (C) Cannizzaro reaction (D) Reimer-Tiemann reaction	1
8.	Which of the following alcohols is not polyhydric? (A) Propylene glycol (B) Ethylene glycol (C) Cyclohexanol (D) Benzene-1,2-diol	1
9.	Which of the following oxidation state is common for all lanthanoids? (A) +2 (B) +3 (C) +4 (D) +5	1
10	Which of the following reactions of glucose can be explained only by its cyclic structure? (A) Glucose forms pentaacetate. (B) Glucose reacts with hydroxylamine to form an oxime. (C) Pentaacetate of glucose does not react with hydroxylamine. (D) Glucose is oxidized by nitric acid to gluconic acid.	1
11.	The correct increasing order of basic strength for the following compounds is _____.  (I)  (II)  (III) (A) II < III < I (B) III < I < II (C) III < II < I (D) II < I < III	1

12	An organic compound 'A' on treatment with NH_3 gives 'B' which on heating gives 'C'. 'C' when treated with Br_2 in the presence of KOH produces ethylamine. Compound 'A' is (A) $CH_3—CH_2—CH_2—COOH$ (B) CH_3COOH (C) $CH_3—CH_2—CH_2—CHO$ (D) $CH_3—CH_2—COOH$	1
	For the Questions number 13 to 16, two statements are given—one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below: (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A). (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A). (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
13.	**Assertion (A)**: Current stops flowing when Ecell = 0. **Reason (R)**: Equilibrium of the cell reaction is attained.	1
14.	**Assertion (A):** Order of the reaction can be zero or fractional. **Reason (R):** We cannot determine order from balanced chemical equation.	1
15.	**Assertion(A)**: Linkage isomerism arises in coordination compounds containing ambidentate ligand. **Reason (R):** Ambidentate ligand has two different donor atoms.	1
16.	**Assertion (A)** : Sucrose is a non-reducing sugar. **Reason (R)** : In sucrose, the aldehydic group of glucose and ketonic group of fructose are not free.	1
	SECTION B **This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.**	
17.	(a)Define azeotropes. (b)What type of azeotrope is formed by negative deviation from Raoult's law? Give an example. **OR** The images below show the evaporation of the solvent on account of the presence of non-volatile solutes. In each of the three cases, the solvent taken is of the same type. The solvent is volatile and its quantity is the same in all three cases.	1+1=2

	 (a)Which of the above three solutions has the least amount of solute in it? (b)How did you reach that conclusion?	1+1=2
18.	(a) State Kohlrausch law of independent migration of ions. (b)Why does the conductivity of a solution decrease with dilution?	1+1= 2
19.	Explain why (**Attempt any two**) i) Haloarenes are less reactive than haloalkanes towards nucleophilic substitution reaction. ii) Alkyl halides, though polar, are immiscible with water? iii) Grignard reagents should be prepared under anhydrous conditions?	1+1=2
20.	Define the following terms as related to proteins: (i) Peptide linkage (ii) Denaturation	1+1=2
21.	In the following ions: Mn^{3+}, V^{3+}, Cr^{3+}, Ti^{4+} (Atomic no.: Mn = 25, V = 23, Cr = 24, Ti = 22) (i) Which ion is the strongest oxidizing agent and why? (ii) Which ion is colourless and why?	1+1=2
	SECTION C **This section contains 7 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each.**	
22.	Λ_m^o for Ba $(OH)_2$, $BaCl_2$ and NH_4Cl are 457.6, 240.6, 129.8 ohm^{-1} cm^2 mol^{-1} respectively. Calculate Λ_m^o for NH_4OH.	3
23.	Represent the cell in which the following reaction takes place: $2Al(s) + 3Ni^{2+}(0.1M) \rightarrow 2Al^{+3}(0.01M) + 3Ni(s)$ Calculate emf of the cell. [E^o_{Cell} = +1.41V, log10 =1]	3

24.	(a) Arrange the following compounds in increasing order of their property as indicated: (i) Acetaldehyde, Acetone, Di-tert-butyl ketone, Methyl tert-butyl ketone (Reactivity towards HCN) (ii) $CH_3CH_2CH(Br)COOH$, $CH_3CH(Br)CH_2COOH$, $(CH_3)_2CHCOOH$, $CH_3CH_2CH_2COOH$ (Acid strength) (b) Give a simple chemical test to distinguish between Propanal and Propanone.	2+1=3
25.	Primary alkyl halide C_4H_9Br (A) reacted with alcoholic KOH to give compound (B). Compound (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) is reacted with sodium metal, it gives compound (D), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Write the equations for all the reactions.	1+1+1=3
26.	(a) What type of linkage is present in nucleic acid. (b) Why must vitamin C be supplied regularly in diet?	1+2=3
27.	Give explanation for each of the following: (i) Cyclohexanone forms cyanohydrin in good yield but 2,2,6-trimethylcyclohexanone does not. (ii) There are two —NH2 groups in semicarbazide, only one is involved in the formation of semicarbazone. (iii) Acetaldehyde, Acetone, Di-tert-butyl ketone, Methyl tert-butyl ketone (reactivity towards HCN). **OR** How do you convert the following? (i) Propanone to Propene (ii) Benzoic acid to Benzaldehyde (iii) Ethanol to 3-Hydroxybutanal	1+1+1=3
28.	i) What is lanthanoid contraction? What are the consequences of lanthanoid contraction? ii) Highest fluoride of Mn is MnF_4 whereas the highest oxide is Mn_2O_7.why?	2+1=3

	SECTION D **The following questions are case-based questions. Each question has an internal choice in 2 marks questions and carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follow.**	
29.	Temperature has a marked effect on the rate of reaction. For most of the reactions, the rate of reaction becomes nearly double for every 10 degrees rise in temperature. The effect of temperature is usually expressed in terms of temperature coefficient. The quantitative dependence of reaction rate on temperature was first explained by Swante Arrhenius. Arrhenius proposed a simple equation known as Arrhenius equation $k = Ae^{-Ea/RT}$ This equation provides a relationship between the rate constant (k) of a reaction and the temperature of the system. A is the Arrhenius factor or pre-exponential factor, Ea is the activation energy and R is the gas constant. According to Boltzmann and Maxwell, the distribution of kinetic energy may be described by plotting the fraction of molecules with a given kinetic energy. The Maxwell-Boltzmann Distribution is important in chemical reactions because it helps to explain the rate of reaction. The speed of particles affects the rate of collision between particles, which in turn affects the rate of reaction and also shows the distribution of energy amongst the particles of an ideal gas. **Answer the following questions:** (i) Define 'activation energy' of a reaction. (ii)What is the expression for the fraction of molecules having energy greater than activation energy? **OR** How does a catalyst affect the rate of a reaction? Explain with respect to the Arrhenius equation. (iii) Can a reaction have zero activation energy? Justify	1 1 2
30.	Pure aliphatic and alkyl amines can be prepared by Gabriel phthalimide reaction. In this reaction, phthalimide is treated with ethanolic KOH solution followed by heating with a suitable alkyl or aralkyl halide to give N-substituted phthalimides. These upon hydrolysis with dil HCl under pressure give primary amines. Primary amines can also be prepared from amides by treatment with Br_2 and KOH by a reaction known as Hoffmann bromamide degradation method. Like ammonia, amines behave as Lewis bases because of the presence of a lone pair of electrons. The basicity	

	of aliphatic amines in aqueous solution depends upon the +I effect of alkyl group as well as the extent of hydrogen bonding with water molecules and the steric effect of the alkyl group. However, aromatic amines are weaker bases than aliphatic amines. Primary amines with three or more carbon atoms are liquid and still higher ones are solid. Aniline and other aryl amines are usually colourless but get coloured on storage due to atmospheric oxidation. **Answer the following questions:** i) How can you distinguish between $CH_3CH_2NH_2$ and $(CH_3CH_2)_2NH$ by Hinsberg test? ii) Which one has more pK_b value; aliphatic amines or ammonia? **OR** Write structure and IUPAC names of the amide which gives propanamine by Hoffmann bromamide reaction. iii) (a) Gabriel phthalimide reaction cannot be used to prepare aniline. Why? (b) Why does aniline not give Friedel-Crafts reaction?	1 1 1+1= 2
	SECTION E **The following questions are long answer types and carry 5 marks each. All questions have an internal choice.**	
31	a) Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litre of water at 25°C, assuming that it is completely dissociated. b) blood cells are isotonic with 0.9% sodium chloride solution. What happening if we placed blood cells in a solution containing (i) 1.2% NaCl solution (ii) 0.4% NaCl solution. **OR** a) Define the following terms: (i) Anoxia (ii) Osmotic pressure (iii) Colligative properties b) Calculate the mass of NaCl (molar mass = 58.5 g mol–1) to be dissolved in 37.2 g of water to lower the freezing point by 2°C, assuming that NaCl undergoes complete dissociation.	3+2 =5 3+2=5

32	a) Give evidence that $[Co(NH_3)_5Cl]SO_4$ and $[Co(NH_3)_5SO_4]Cl$ are ionisation isomers. b) Explain on the basis of valence bond theory that $[Ni(CN)_4]^{2-}$ ion with square planar structure is diamagnetic and the $[NiCl_4]^{2-}$ ion with tetrahedral geometry is paramagnetic. **OR** $CoSO_4Cl.5NH_3$ exists in two isomeric forms 'A' and 'B'. Isomer 'A' reacts with $AgNO_3$ to give white precipitate, but does not react with $BaCl_2$. Isomer 'B' gives white precipitate with $BaCl_2$ but does not react with $AgNO_3$. Answer the following questions: (i) Identify 'A' and 'B' and write their structural formulae. (ii) Name the type of isomerism involved. (iii) Give the IUPAC name of 'A' and 'B'.	2+3 2+1+2 =5
33	(a) Give equations of the following reactions: (i) Phenol is treated with conc. HNO_3. (ii) Propene is treated with B_2H_6 followed by H_2O_2/OH^-. (iii) Sodium t-butoxide is treated with CH_3Cl. (b) How will you distinguish between butan-1-ol and butan-2-ol? (c) Arrange the following in increasing order of acidity: Phenol, ethanol, water **OR** a) Write the equations involved in the following reactions: (i) Reimer–Tiemann reaction (ii) Kolbe's reaction b) Write the mechanism of the following reaction: $2CH_3\text{-}CH_2\text{-}OH \xrightarrow{conc.\frac{H2SO4}{413\,k}} CH_3\text{-}CH_2\text{-}O\text{-}CH_2\text{-}CH_3$ c) How you distinguish between Ethanol and phenol	3+1+1 =5 2+2+1= 5

*******END OF THE PAPER *******

Pre-Board Examination (2025-26)
Subject-Biology
Class-XII

MM: 70 **Time: 3 hours**

General Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions.
(iii) Section–A has 16 questions of 1mark each; Section–B has 5 questions of 2 marks each; Section–C has 7 questions of 3 marks each; Section–D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
(iv) There is no overall choice. Answer all 33 questions. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

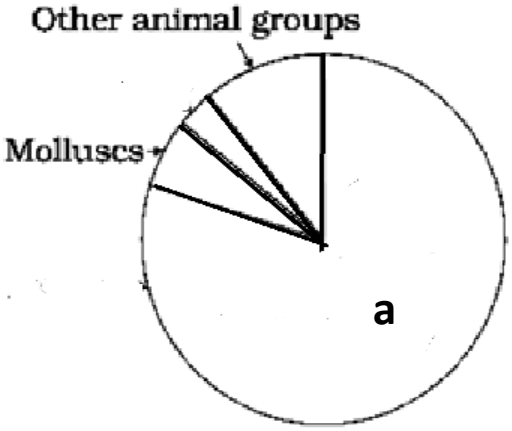
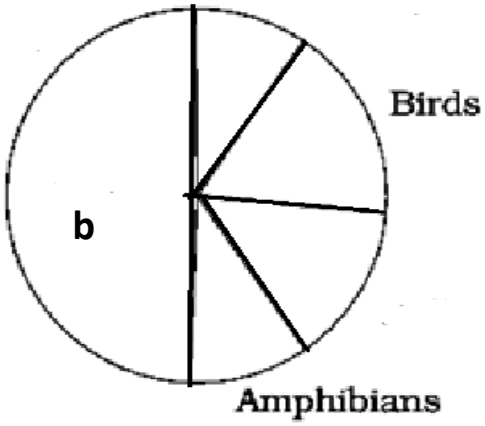
SECTION A

Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

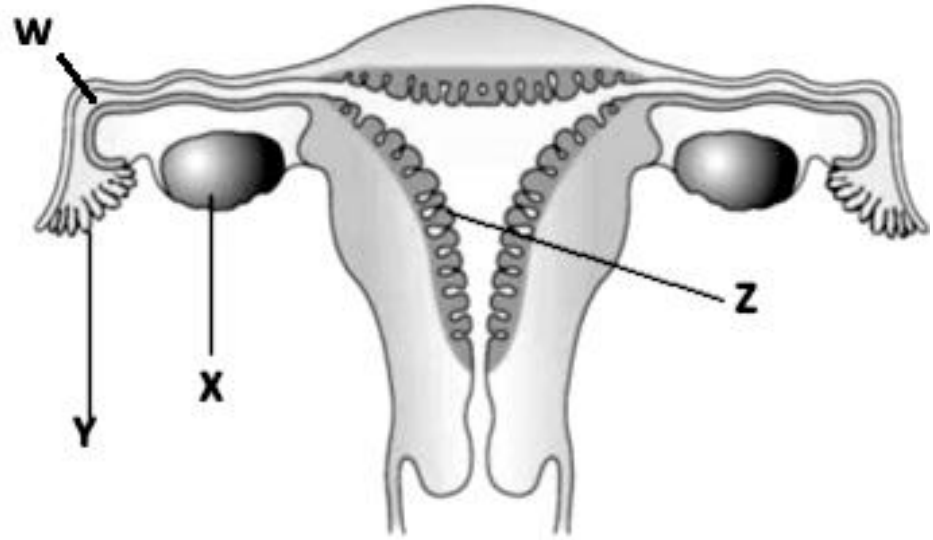
Q. No.	Question	Marks
1	Which one of the following statements is not true? A. Pollen grains of many species cause severe allergies. B. Stored pollen in liquid nitrogen can be used in the crop breeding programme. C. Tapetum helps in the dehiscence of anther. D. Exine of pollen grains is made up of sporopollenin.	1
2	The three cells found in a pollen grain when it is shed at 3-celled stage are A. One vegetative cell, one generative cell, one male gamete B. One generative cell, one vegetative cell, one male gamete C. One generative cell, two male gametes D. One vegetative cell, two male gametes	1
3	Choose the correct statements: P. In the human pregnancy, the major organ systems are formed at the end of 12 weeks. Q. In human pregnancy the major organ systems are formed at the end of 8 weeks. R. In human pregnancy heart is formed after one month of gestation. S. In human pregnancy, limbs and digits develop by the end of second month. T. In human pregnancy the appearance of hair is usually observed in the fifth month. Select the correct answer from the options given below: A. Q, R, S and T only B. P, R, S and T Only C. P and T Only D. Q and R Only	1
4	With regard to mature mRNA in eukaryotes: A. Exons and introns do not appear in the mature RNA B. Exons appear but introns do not appear in the mature RNA C. Introns appear but exons do not appear in the mature RNA	1

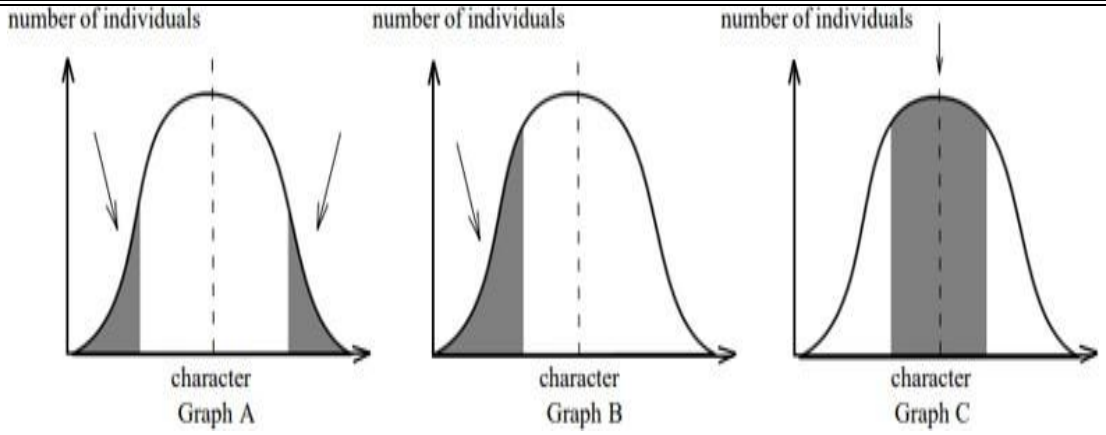
	D. Both exons and introns appear in the mature RNA	
5.	What is the primary lymphoid organ where T-lymphocytes mature?* A. Spleen B. Thymus C. Lymph nodes D. Bone marrow	1
6	If a genetic disease is transferred from a phenotypically normal but a carrier female to only some of the female progeny, the disease is: A. Autosomal dominant B. Autosomal recessive C. Autosomal dominant D. Sex-linked recessive	1
7	Chromosomal theory of inheritance was given by A. Morgan *et al* B. Sutton and Boveri C. Hugo deVries D. Gregor J. Mendel	1
8	Variations caused due to mutations are A. random and directionless B. random and directional C. random and small D. random, small and directional	1
9	Match List I with List II **LIST I** / **LIST II** P — *Clostridium butylicum* — I — Ethanol Q — *Saccharomyces cerevisiae* — II — Streptokinase R — *Trichoderma polysporum* — III — Butyric Acid S — *Streptococcus sp* — IV — Cyclosporin A Choose the correct answer from the options given below: A. P -III, Q -I, R -II, S -IV B. P -II, Q -IV, R -III, S -I C. P -III, Q -I, R -IV, S -II D. P -IV, Q -I, R -III, S -II	1
10	What is the purpose of DNA sequencing? A. To amplify DNA sequences B. To identify genes C. To determine the order of nucleotides in DNA D. To clone genes	1
11	While isolating DNA from bacteria, which of the following enzymes is not required? A. Lysozyme B. Ribonuclease C. Deoxyribonuclease D. Protease	1
12	The role of DNA ligase in the construction of rDNA molecule is: A. formation of hydrogen bonds between sticky ends of DNA fragments B. ligation of all purine and pyrimidine bases	1

	C. Joining together of DNA fragments having the same kind of 'sticky-ends' D. formation of phosphodiester bond between two DNA fragments having the same kind of 'sticky-ends'	
Question No. 13-16 consist of two statements - Assertion (A) and Reason (R). Answer these questions 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 and R is not the correct explanation of A.** **C. A is true but R is false.** **D. A is false and R is true.**		
13	**Assertion:** Parturition is induced by neural signal in maternal pituitary. **Reason:** At the end of gestation period, the maternal pituitary releases oxytocin which causes uterine contractions.	1
14	**Assertion:** Artificial insemination is the method of introduction of semen inside the female. **Reason:** This technique is used in those cases where males have low sperm count.	1
15	**Assertion:** Thorns of *Bougainvillea* and tendrils of Cucurbita represent homology. **Reason:** Homologous organs have similar functions but are different in their structural details and origin.	1
16	**Assertion:** Evolution is a continuous process that has shaped the diversity of life on Earth. **Reason:** Evolution occurs exclusively through the process of natural selection.	1
	SECTION B	
17.	***Attempt either option A or B.*** A. Oral pills are very effective with lesser side effects and are well accepted by the females. Why is *Saheli* –the new oral contraceptive for females, preferred over oral pills? **OR** B. How is Multiload 375 different from LNG-20?	2
18	Given below is the sequence of coding strand of DNA in a transcription unit: 3 '- A A T G C A G C T A T T A G G – 5' Write the sequence of: A. its complementary strand B. the mRNA	2
19	This is the table showing the prevalence of mentioned STIs in a Family Planning Clinic. Based on the information provided answer the questions that follow: **Causal organism** / **STIs** / **Prevalence** *Chlamydia trachomatis* / Chlamydiasis / 23.0% *Trichomonas vaginalis* / Trichomoniasis / 5.6% *Herpes simplex* viruses / Genital Herpes / 4.6% *Neisseria gonorrhoeae* / Gonorrhoea / 3.1% *Treponema pallidum* / Syphilis / 1.02% A. Based on the table, which STI has the highest prevalence in the population? What preventive measures can be taken to control its spread? B. Prevalence of bacterial STIs is more than the viral STIs according to the data in the above table from a Family Planning Clinic. Discuss briefly.	2

20.	***Attempt either option A or B.***	2
	A. Name the organism where *Ti* plasmid is found. Now it is a powerful tool in genetic engineering with applications in crop improvement and nutritional enhancement. Support the statement with your understanding of biotechnology. **OR** B. (i) What is the difference between recombinant DNA and recombinant protein? (ii) After downstream processing, the product of the biosynthetic stage cannot be marketed directly. Give two reasons to support your answer.	
21	***Attempt either option A or B***	2
	A. Observe the Fig.1 and Fig. 2 illustrating the proportionate number of species of major taxa of invertebrates and vertebrates, respectively, according to the currently available species inventories.  **Fig. 1**  **Fig. 2** (i) Identify 'a' and 'b' taxa which represent proportionately higher number of species of invertebrates and vertebrates in Fig. 1 and Fig, 2, respectively. (ii) Draw the diagram to illustrate the proportionate number of species of some major taxa of plants. --- ***For visually impaired students*** A. (i) Stability of a community depends on its species richness. How was it experimentally shown by David Tilman. (ii) Biodiversity hotspots cover less than 2% of Earth's land area. Strict protection of these areas can reduce the rate of ongoing extinctions. Name any two hotspots in India. **OR** B. (i) The Tundra desert's gross primary productivity (GPP) is 800 kilo calories/m^2 and respiration losses are about 200 kilo calories. Calculate the net primary productivity of the desert. (ii) Why do deserts have the least NPP across most ecosystems?	

SECTION C

22	Give scientific explanations for the following: A. Why is tobacco smoking associated with rise in blood pressure and emphysema (oxygen deficiency in the body)? B. Why does a doctor administer tetanus antitoxin and not a tetanus vaccine to a child injured in roadside accident with a bleeding wound? C. The anamnestic response is faster and more intense than primary response.	3
23	The diagrammatic sectional view of the female reproductive system is illustrated below. Answer the questions that follow:  A. Successful fertilization will take place only when 'Y' part in the above diagram functions properly. Justify. B. Surgical intervention takes place in 'W' part of the above diagram. How does this procedure justify its efficacy? What is a major disadvantage of this procedure? C. Corpus luteum formed in 'X' is responsible to maintain 'Z' for successful pregnancy. Explain. --- ***For visually impaired students.*** A. Mention the stage at which the process of oogenesis temporarily gets arrested and name the cells thus formed in the ovary of a baby girl at the time of her birth. B. Placenta acts as a temporary endocrine tissue and forms a functional junction between the mother and foetus. Explain.	3
24	A. In the context of primary productivity, which ecosystem would be more productive? A natural old forest, a young forest, alpine meadow, a shallow polluted lake. Give reason. B. The rate of decomposition is controlled by chemical composition of detritus and climatic factors. Discuss.	3
25	The graphs below show three types of natural selection. The shaded areas marked with arrows show the individuals in the population which are not selected. The dotted vertical lines show the statistical means.	3

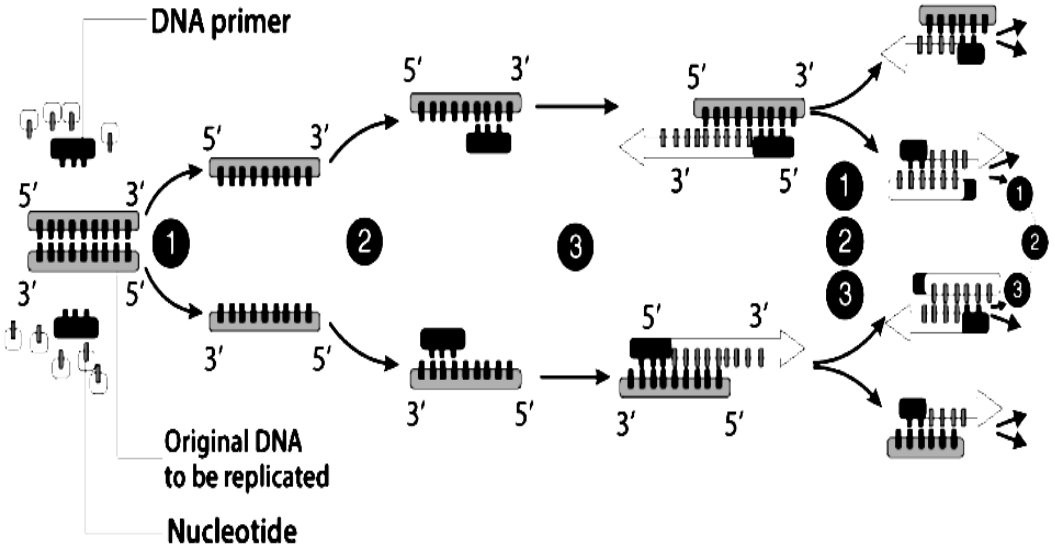


A. Name the types of natural selections shown in graphs A, B and C.
B. After the selection has operated for several generations in the above populations indicated as Graph 'A', 'B' and 'C', graphically illustrate the probable results.

For visually impaired students

In a population of birds, individuals with intermediate beak sizes can effectively feed on a range of available seeds while birds with either small or large beak sizes find it difficult to access certain seeds.

A. Which birds are more likely to be naturally selected and why?
B. Which type of natural selection does the above phenomenon exemplify?

26	Biofertilisers are organisms that enrich the nutrient quality of the soil and form an inseparable part of organic farming. Explain bacteria, fungi and cyanobacteria in this context giving examples of each.	3
27	A. Why is sickle cell anaemia, a human blood disorder so named? Explain the genetic basis that results in the expression of this disorder. B. Workout a cross to explain how normal parents may have a sickle cell anaemic child.	3
28.	The schematic sketch of different stages of Polymerase chain reaction is illustrated in the diagram below to answer the questions that follow:  	3

A. How many DNA molecules will be formed after three cycles of PCR?
B. Cite specific reasons for the requirement of high temperature in step 1, primers specifically joining the 3′ end of the desired gene to be amplified in step 2 and use of *Taq* polymerase instead of normal DNA polymerase in step 3.

For visually impaired students

A. How many DNA molecules will be formed after three cycles of PCR?
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SECTION D

29 Study the following table which differentiates between two types of pollen transfers, and answer the questions that follow with justification for each answer: **4**

Code	Characteristic	Type A	Type B
P	Transfer of pollen	From anther to stigma of the same flower	From anther to the stigma of a different plant
Q	Genetic variation	Progeny is genetically pure	Progeny shows genetic variation
R	Presence of a pollinating agent	Not required, but synchronous pollen release and stigma receptivity is needed	Required for pollen transfer

A. Name any one outbreeding device that helps prevent Type A type of pollen transfer in flowering plants.
B. Which type of pollination is genetically similar to Type A but functionally similar to Type B?

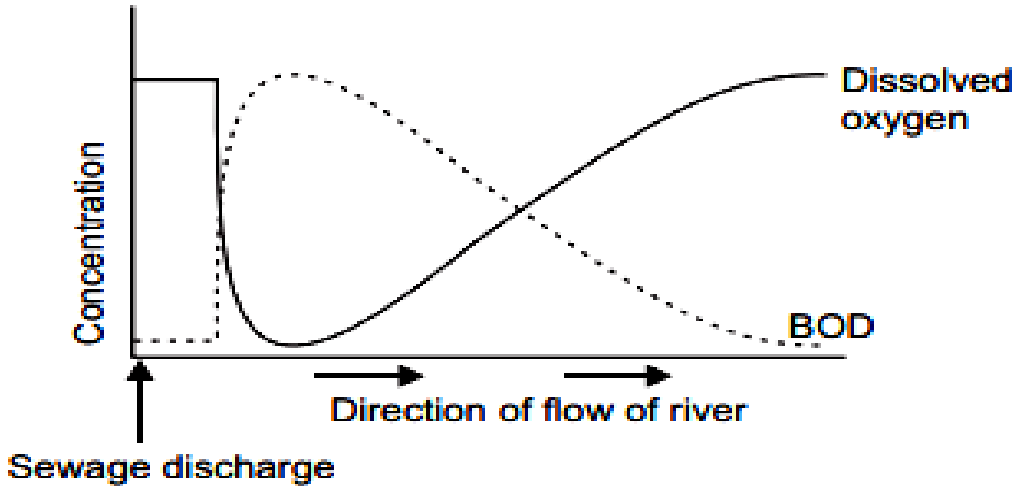
Attempt either subpart C or D.

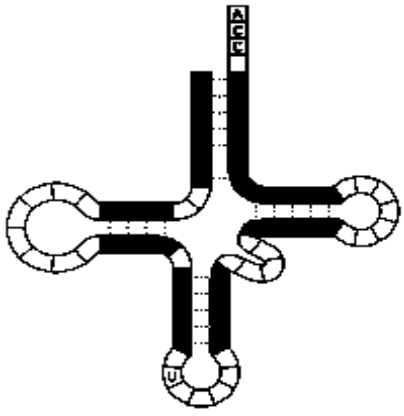
C. Why should Type A flowers be emasculated and bagged prior to artificial pollination?

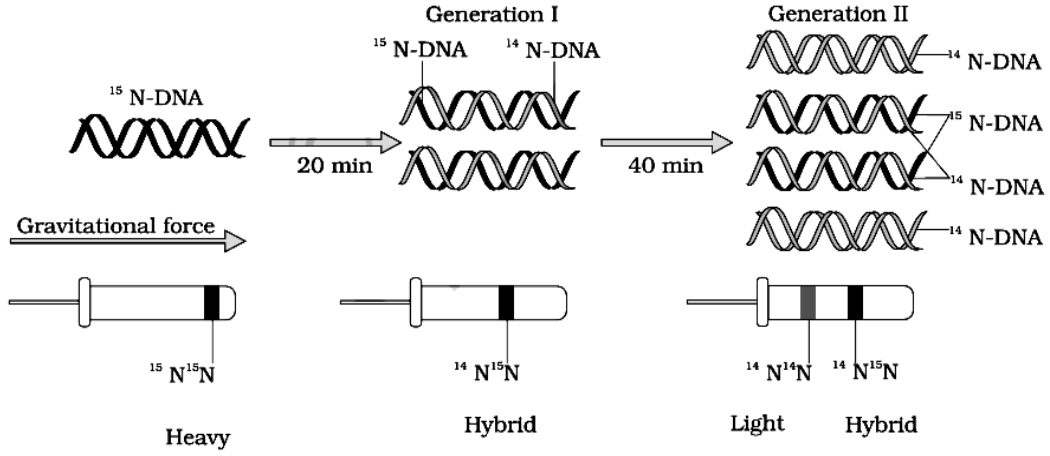
OR

D. Name the type of pollen transfers that may lead to inbreeding depression. Explain briefly.

30 Study the graph given below and answer the questions that follow: **4**



	A. Expand BOD. B. Three water samples (X, Y, and Z) have BOD values of 20 mg/L, 8 mg/L and 400 mg/L, respectively. These samples are known to be river water, untreated sewage water, and secondary effluent from a sewage treatment plant. Which sample is the most polluted, and how would you label each sample? ***Attempt either subpart C or D.*** C. Why does the level of BOD suddenly increase immediately after the sewage discharge? **OR** D. What impact would the increase in DO (dissolved oxygen) level and decrease in BOD level have on fish and other aquatic life further downstream the flowing river? --- ***For visually impaired students*** Changes in BOD and dissolved oxygen (DO) levels in a flowing river body were observed. At the point of sewage discharge, DO suddenly decreases and BOD increases and further downstream along the direction of flow of river, their levels just got reversed. A. Expand BOD. B. Three water samples (X, Y, and Z) have BOD values of 20 mg/L, 8 mg/L and 400 mg/L, respectively. These samples are known to be river water, untreated sewage water, and secondary effluent from a sewage treatment plant. Which sample is the most polluted, and how would you label each sample? ***Attempt either subpart C or D.*** C. Why does the level of BOD suddenly increase immediately after the sewage discharge? **OR** D. What impact would the increase in DO (dissolved oxygen) level and decrease in BOD level have on fish and other aquatic life further downstream the flowing river?	
	SECTION E	
31	A. Below is an illustration of the secondary structure of tRNA. Also given are the following components: two amino acids Serine (Ser) and tyrosine (Tyr), four triplet ribonucleotide sequences AUG, AGU, UCA and UAC. Construct any single complete schematic assembly using given components to show that tRNA serves as an adapter molecule as postulated by Francis Crick. 	5

	B. What is the substrate for the synthesis of enzyme beta-galactosidase? Explain how *lac* operon is regulated for enzyme synthesis by its substrate. --- ***For visually impaired students*** A. What are untranslated regions (UTR) in a mRNA transcript? State their significance. B. What is the substrate for the synthesis of enzyme beta-galactosidase? Explain how *lac* operon is regulated for enzyme synthesis by its substrate. **OR** A. What does scheme of semiconservative model of DNA replication suggest? B. Replication of DNA begins at *ori*, to form a replication fork. Explain the process. C. The diagram below shows experimental evidence for semiconservative nature of DNA replication. If the experiment was continued for a third generation (60 minutes), what would be the ratio of hybrid DNA to light DNA?  (Separation of DNA by Centrifugation) --- ***For visually impaired students*** C. Experiment involving use of radioactive thymidine was performed and it also proved that the DNA in chromosomes replicate semi-conservatively. Name the scientists who made these similar observations in plants and name their plant.	
32	A. List the three molecular diagnostic techniques that help detect pathogens from suspected patients. Mention one advantage of these techniques over conventional methods. B. Plasmid is a boon to biotechnology. Justify this statement quoting the production of human insulin as an example. **OR** A. List the optimal growth conditions provided in a bioreactor for achieving the desired product. B. Draw a neat and well labelled diagram of a simple stirred-tank bioreactor used as a continuous culture system for producing a larger biomass leading to higher yields of desired protein. C. Construct a flow chart showing different steps of downstream processing.	5

33. A population of 100 spotted deer was living without any carnivores is an enclosure of a few hectares of rich tropical forest land. Deer census was taken at time zero and after a few years. 5

A. Draw the growth curve that represents the deer population at time zero.
B. Is it a realistic one? Justify?
C. Draw another growth curve to show the impact on deer population if some tigers are introduced after five years? Give reason to support your answer.
D. 'r' is an important parameter assessing impacts of any biotic or abiotic factor on population growth. What does 'r' stand for in a population growth equation?
E. How does the increase and decrease in the value of 'r' affect the population size?

OR

The table given below represents inter-specific interaction between two species of *Paramecia* competing for the same resource in a culture medium. *Paramecium caudatum* and *Paramecium aurelia* were grown in separate cultures as well as in mixed cultures. It was found that each species grew in numbers according to the logistic equation.

Culture conditions	**Names of *Paramecium* sps.**	**No. of *Paramecium* sps. at different time intervals of culture initiation**	
		After 8 days	**After 16 days**
Separate	*Paramecium caudatum*	60	60
Separate	*Paramecium aurelia*	100	100
Mixed	*Paramecium caudatum*	20	05
Mixed	*Paramecium aurelia*	80	95

A. Which species is competitively superior?
B. State the underlying principle for the above result and name the scientist associated with this principle.
C. Explain the mechanism in which two or more species competing with each other can co - exist.

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