

IMPORTANT INSTRUCTIONS

GENERAL INSTRUCTIONS

1. This booklet is your Question Paper.
2. Blank papers, clip boards, log tables, slide rule, calculators, mobile or any other electronic gadgets in any form are not allowed to be used.
3. Write your **Name** in the space provided in the first page of this booklet.
4. No rough sheets will be provided by the invigilators. All the rough work is to be done in the blank space provided in the question paper.
5. No query related to question paper of any type is to be put to the invigilator.

INSTRUCTIONS FOR OPTICAL RESPONSE SHEET (ORS)

- Darken the appropriate bubbles on the original by applying sufficient pressure.
- The original is machine-gradable and will be collected by the invigilator at the end of the examination.
- Do not tamper with or mutilate the ORS.
- Before answering the paper, fill up the required details in the blank space provided in the Objective Response Sheet (ORS).
- Do not forget to mention your paper code and **Application Form Number** neatly and clearly in the blank space provided in the Objective Response Sheet (ORS) / Answer Sheet.
- Use a **BLACK BALL POINT** to darken the bubbles in the upper sheet.
- Darken the bubble **COMPLETELY**.
- Darken the bubble **ONLY** if you are sure of the answer.
- The correct way of darkening a bubble is as shown here :
- There is **NO** way to erase or "un-darkened bubble.
- The marking scheme given at the beginning of each section gives details of how darkened and **not darkened** bubbles are evaluated.

Marks distribution of questions is as follows.

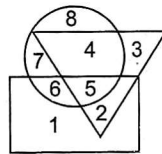
V-SAT 2025						
S.No.	Subject	Nature of Questions	Marks to be awarded			
			No. of Questions	Correct	Wrong	Total
1 to 15	PART-I (Mental Ability)	Single Choice Questions (SCQ)	15	4	0	60
16 to 30	PART-II (Maths)	Single Choice Questions (SCQ)	15	4	0	60
31 to 35	PART-III (Physics)	Single Choice Questions (SCQ)	05	4	0	20
36 to 40	PART-V (Chemistry)	Single Choice Questions (SCQ)	05	4	0	20
41 to 45	PART-IV (Biology)	Single Choice Questions (SCQ)	05	4	0	20
Total			45			180

Zero marks '0' If none of the options is chosen (i.e. the question is unanswered).

MENTAL ABILITY

This section contains 15 Multiple Choice Questions. Each question has four choices (a) (b) (c) and (d) out of which ONLY ONE is correct.

1. In a certain code, 'PLEADING' is written as 'CHMFQMFB'. How is 'SHOULDER' written in that code?
 (a) KCDQTIPV (b) QDCKVPIT (c) KCDQTIPV (d) TIPVQDCK
2. Which group of letter is different from others?
 (a) PBQTX (b) DRYSN (c) MEWGN (d) CGHKV
3. In the following letter sequence, some of the letters are missing. These are given in order as one of the alternatives below. Choose the correct alternative.
 _ b b c a _ b c c a _ a c _ a _ c b
 (a) abcba (b) acbab (c) bacab (d) bcaab
4. Find the next number in the sequence.
 30, 120, 350, 720, ?
 (a) 1150 (b) 1300 (c) 1200 (d) 1342
5. In the figure, triangle represents doctors, the circle represents players and rectangle represents artists.



Then, which number represents doctors who are neither players nor artists?

- (a) 2 (b) 3 (c) 4 (d) 5

SPACE FOR ROUGH WORK

6. Question given below has a problem and two Statements I and II. Decide, if the information given in the statements is sufficient to answer the problem. Among Maddy, Nittu, Dev, Pinku and Kunal, who earns more than only the least earner among them

Statements

I. Nittu earns more than Maddy and Pinku but less than only Dev.

II. Maddy earns more than Pinku who earns less than Kunal.

- (a) Data in Statement I alone is sufficient
 (b) Data in Statement II alone is sufficient
 (c) Data in both statements together is sufficient
 (d) Data in both statements together is not sufficient
7. In question, the five letters represent five different digits. What are the actual figures? If there is no zero?

$$\begin{array}{r} L\ M\ N\ K \\ +\ M\ K\ N\ L \\ \hline N\ N\ M\ A \end{array}$$

- (a) $L = 4, M = 6, N = 2, K = 3, A = 7$ (b) $L = 6, M = 5, N = 2, K = 8, A = 7$
 (c) $L = 4, M = 2, N = 6, K = 3, A = 7$ (d) $L = 6, M = 4, N = 7, K = 9, A = 2$
8. Find the missing term in the series.
 2, 4, 2, 6, 3, 12, ?, 40
 (a) 8 (b) 6 (c) 11 (d) 5
9. At the end of a business conference, the ten people present, all shake hands with each other once. How many hand shakes will there be all together?
 (a) 60 (b) 45 (c) 55 (d) 90

SPACE FOR ROUGH WORK

Directions (Q. Nos. 10-11) Take the given statement(s) are true and decide which of the conclusions logically follows from the statements.

- 10. Statements** All desks are chairs. No chair is a table. Some tables are fans. Some fans are chairs.

Conclusions

- I. Some desks are tables. II. Some fans are desks. III. No desks is a table.

- (a) Only Conclusion I follows (b) Only Conclusion II follows
(c) Only Conclusion III follows (d) All conclusions follow

- 11. Statements** All vegetables are fruits. No vegetables are cereals. All cereals are fruits. Some cereals are healthy.

Conclusions

- I. Some fruits are healthy. II. No vegetable is healthy. III. All healthy are fruits.

- (a) Only Conclusion I follows (b) Only Conclusion II follows
(c) Only Conclusion III follows (d) Both Conclusions II and III follow

Directions (Q. Nos. 12) Find the missing number in the following questions.

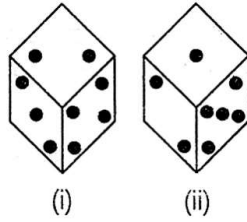
12.



- (a) 5 (b) 125 (c) 625 (d) 156

SPACE FOR ROUGH WORK

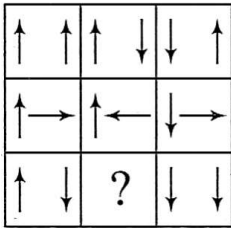
13. A dice is rolled twice and the two positions are shown in the figure below. What is the number of dots at the bottom face when the dice is in position (i)?



- (a) 1
(b) 5
(c) 6
(d) cannot be determined
14. There are 40 boys and girls arranged in a queue in the decreasing order of their height. If Ranvijay is at 17th position and there are 9 boys ahead of him, then total boys behind Ranvijay, if there are 17 girls in total are
- (a) 10 (b) 13 (c) 12 (d) 17

Directions : Which figure will replace the 'question mark' from the options to complete the figure?

15. **Problem Figures**



- (a)

↑	↑
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 (b)

↓	↑
---	---

 (c)

↑	↓
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 (d)

↑	→
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SPACE FOR ROUGH WORK

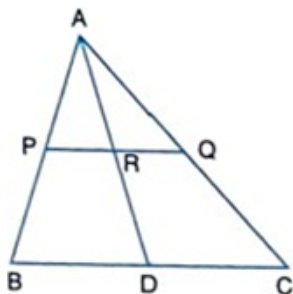
MATHEMATICS

This section contains 15 Multiple Choice Questions. Each question has four choices (a) (b) (c) and (d) out of which ONLY ONE is correct.

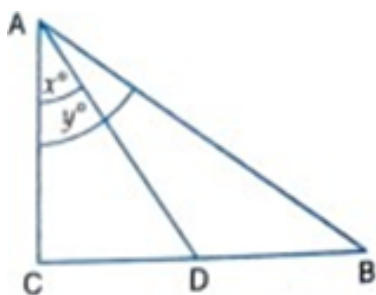
16. The smallest number which when divided by 17, 23 and 29 leaves a remainder 11 in each case is
 (a) 493 (b) 11350 (c) 11339 (d) 667
17. If α, β, γ are the zeroes of the polynomial $f(x) = ax^3 + bx^2 + cx + d$, then $\alpha^2 + \beta^2 + \gamma^2 =$
 (a) $\frac{b^2 - ac}{a^2}$ (b) $\frac{b^2 - 2ac}{a}$ (c) $\frac{b^2 + 2ac}{b^2}$ (d) $\frac{b^2 - 2ac}{a^2}$
18. If α, β, γ are the zeros of the polynomial $f(x) = ax^3 - 5x + 9$ such that $\alpha^3 + \beta^3 + \gamma^3 = 27$, then the value of a is
 (a) -3 (b) 3 (c) 1 (d) -1
19. If $ax + by = a^2 - b^2$ and $bx + ay = 0$, then the value of $x + y$ is
 (a) $a^2 - b^2$ (b) $a + b$ (c) $a - b$ (d) $a^2 + b^2$
20. $\triangle ABC$ is such that $AB = 3\text{cm}$, $BC = 2\text{cm}$, $CA = 2.5\text{cm}$. If $\triangle ABC \sim \triangle DEF$ and $EF = 4\text{cm}$, then perimeter of $\triangle DEF$ is
 (a) 7.5 cm (b) 15 cm (c) 22.5 cm (d) 30 cm

SPACE FOR ROUGH WORK

21. In Fig. if $AP = 3\text{cm}$, $AR = 4.5\text{cm}$, $AQ = 6\text{cm}$, $AB = 5\text{cm}$ and $AC = 10\text{cm}$, then AD is equal to



- (a) 5.7 cm (b) 7.6 cm (c) 5.5 cm (d) 7.5 cm
22. In Fig. if D is the mid-point of BC , then the value of $\frac{\cot y^\circ}{\cot x^\circ}$ is



- (a) 2 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{3}{4}$
23. $\tan^4 \theta + \tan^2 \theta =$
- (a) $\sec^2 \theta - 2 \sec^4 \theta$ (b) $2 \sec^2 \theta - 2 \sec^4 \theta$
 (c) $\sec^2 \theta - \sec^4 \theta$ (d) $\sec^4 \theta - \sec^2 \theta$
24. If $\cos A + \cos^2 A = 1$, then $\sin^2 A + \sin^4 A =$
- (a) -1 (b) 0 (c) 1 (d) none of these

SPACE FOR ROUGH WORK

25. If $x^2 + k(4x + k - 1) + 2 = 0$ has equal roots, then $k =$
 (a) $-\frac{2}{3}, 1$ (b) $\frac{2}{3}, -1$ (c) $\frac{3}{2}, \frac{1}{3}$ (d) $-\frac{3}{2}, -\frac{1}{3}$
26. The common difference of the A.P. $\frac{1}{2b}, \frac{1-6b}{2b}, \frac{1-12b}{2b}$, is
 (a) $2b$ (b) $-2b$ (c) 3 (d) -3
27. The first and last term of an A.P. are a and l respectively. If S is the sum of all the terms of the A.P. and the common difference is given by $\frac{l^2 - a^2}{k - (l + a)}$, then $k =$
 (a) S (b) $2S$ (c) $3S$ (d) none of these
28. A circle drawn with origin as the centre passes through $(13/2, 0)$. The point which does not lie in the interior of the circle is
 (a) $(-3/4, 1)$ (b) $(2, 7/3)$ (c) $(5, -1/2)$ (d) $(-6, 5/2)$
29. The angle of elevation of the top of a tower standing on a horizontal plane from a point A is α . After walking a distance d towards the foot of the tower the angle of elevation is found to be β . The height of the tower is
 (a) $\frac{d}{\cot \alpha + \cot \beta}$ (b) $\frac{d}{\cot \alpha - \cot \beta}$ (c) $\frac{d}{\tan \beta - \tan \alpha}$ (d) $\frac{d}{\tan \beta + \tan \alpha}$
30. Two poles are ' a ' metres apart and the height of one is double of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the smaller is
 (a) $\sqrt{2}a$ metres (b) $\frac{a}{2\sqrt{2}}$ metres (c) $\frac{a}{\sqrt{2}}$ metres (d) $2a$ metres

SPACE FOR ROUGH WORK

PHYSICS

This section contains 05 Multiple Choice Questions. Each question has four choices (a) (b) (c) and (d) out of which ONLY ONE is correct.

31. How many images of himself does an observer see if two adjacent wall and the ceiling of a rectangular room are mirror surfaced ?
- (a) 6
 - (b) 7
 - (c) 3
 - (d) 5
32. When we enter a cinema hall we cannot see properly for a short time. This is because
- (a) Pupil does not open
 - (b) Pupil does not close
 - (c) Adjustment of the size of pupil take some time
 - (d) None of these
33. If a lens has power -2.5 D , then it is a
- (a) Convex lens with a focal length of 40 cm
 - (b) concave lens with a focal length of 40 cm
 - (c) concave lens with a focal length of 0.4 cm
 - (d) convex lens with a focal length of 0.4 cm
34. Two plane mirror are inclined to each other at some angle. A Ray of light is incident on one of them at an angle of 40° the light after reflection fall on the second mirror and gets reversed. the angle between the mirror is.
- (a) 17.5 degree
 - (b) 40 degree
 - (c) 52.5 degree
 - (d) 70 degree
35. A ray of light fall on one face of an equilateral glass prism at 50° and emerge from the other face at the same angle. the deviation suffered by the ray is
- (a) 60 degree
 - (b) 40 degree
 - (c) 80 degree
 - (d) 20 degree

CHEMISTRY

This section contains 05 Multiple Choice Questions. Each question has four choices (a) (b) (c) and (d) out of which ONLY ONE is correct.

36. State the colour of Phenolphthalein in a soap solution

- (a) Red (b) Pink (c) Colourless (d) Yellow

37. Which of the following reaction will not take place?

- (a) $\text{Zn} + \text{CuSO}_4 \longrightarrow \text{ZnSO}_4 + \text{Cu}$
 (b) $2\text{KBr} + \text{Cl}_2 \longrightarrow 2\text{KCl} + \text{Br}_2$
 (c) $\text{Zn} + \text{MgSO}_4 \longrightarrow \text{ZnSO}_4 + \text{Mg}$
 (d) $\text{Mg} + \text{FeSO}_4 \longrightarrow \text{MgSO}_4 + \text{Fe}$

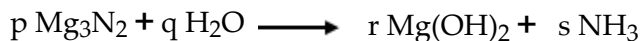
38. Complete the Reaction: $\text{Zn} + 2\text{NaOH}$

- (a) $\text{Zn}(\text{OH})_2 + \text{H}_2$ (b) $\text{Na}_2\text{ZnO}_2 + \text{H}_2$
 (c) $\text{Zn}(\text{OH})_2 + \text{Na}_2\text{O}$ (d) $\text{Na}_2\text{ZnO}_2 + \text{Na}_2\text{O}$

39. Non -Metals generally act as:

- (a) Oxidizing agent (b) Reducing agent
 (c) Both a & c (d) None of these

40. Consider the following reaction:



When the equation is balanced the coefficient p,q,r,s respectively are

- (a) 1, 3, 3, 2 (b) 1, 6, 3, 2
 (c) 1, 2, 3, 2 (d) 2, 3, 6, 2

BIOLOGY

This section contains 05 Multiple Choice Questions. Each question has four choices (a) (b) (c) and (d) out of which ONLY ONE is correct.

41. A sportsman, after a long break of his routine exercise, suffered muscular cramps during a heavy exercise session. This happened due to :
- (a) lack of carbon dioxide and formation of pyruvate.
 (b) presence of oxygen and formation of ethanol.
 (c) lack of oxygen and formation of lactic acid.
 (d) lack of oxygen and formation of carbon dioxide.
42. Choose the forms in which most plants absorb nitrogen:
- I) Proteins. II) Nitrates and Nitrites. III) Urea. IV) Atmospheric nitrogen.
- (a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)
43. One of the following statements is not true about thyroxine. This is:
- (a) Thyroid gland requires iron to synthesis thyroxine
 (b) It regulates carbohydrates , protein and fat metabolism.
 (c) Iodine is essential for the synthesis of thyroxine.
 (d) Thyroid gland can enlarge due to lack of thyroxine
44. Which of the following statements are true about the brain?
- i. The main thinking part of the brain is the hind brain.
 ii. Centres of hearing, smell, memory, sight etc are located in the fore brain.
 iii. Involuntary actions like salivation, vomiting, blood pressure are controlled by the medulla in the hind brain.
 iv. The cerebellum does not control posture and balance of the body.
- (a) (i) and (ii) (b) (i), (ii) and (iii)
 (c) (ii) and (iii) (d) (iii) and (iv)
45. When light falls on a part of the plant, a hormone called which is synthesized at the tip of the shoot helps the cells to grow longer.
- (a) Gibberellins (b) Cytokinins (c) Ethylene (d) Auxin

SPACE FOR ROUGH WORK