SAMPLE PAPER Engineering

M-STAR

Momentum Scholarship Test for Admission & Rewards

10th Edition, 2025

Talent HUNT Exam

(Class X Studying Moving to Class XI)

Physics, Chemistry, Mathematics & Mental Ability

INSTRUCTIONS FOR CANDIDATE

1. Duration of Test is 1 hr.
2. The Test Booklet consists of 40 questions. The maximum marks are 90. There is **no negative marking** for wrong answer.
3. **Pattern of the questions are as under:**

   The question paper consists of three subjects i.e., **, Physics, Chemistry, Mathematics** and **Mental Ability.** There are two sections in this question paper**.**

(i) **Section-I:** This section contains **35 multiple choice questions**, which have **only one correct** answer. Each question carries **+2 marks** for correct answer.

(ii) **Section-II:** This section contains 5 multiple choice questions, in which **one or more than one choice(s)** is/are correct. Each question carries **+4 marks** for correct answer.

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SECTION - I

This section contains **35 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct. Each question carries **+2 Marks** for correct answer.

1. The inability among the elderly to see nearby clearly because of the weakning of the ciliary muscles is called

(A) Far sightedness (B) Near sightedness
(C) Presbyopia (D) Astigmatism

2. In a compound microscope, the intermediate image is :

(A) Virual, erect and magnified (B) Real, erect and magnified
(C) Real, inverted and magnified (D) Virtual, erect and reduced

3. Focal length of objective of an astronomical telescope is 1.5 m. What should be the focal length of eye - piece to get the magnification of 25 times?

(A) 0.06 m (B) 2.5 m (C) 1.07 m (D) 1.35 m

4. Which of the following conditions are necessary for total internal reflection to take place at the boundary of two optical media?

I. Light is passing from optically denser medium to optically rarer medium.

II. Light is passing from optically rarer medium to optically denser medium.

III. Angle of incidence is greater than the critical angle.

IV. Angle of incidence is less than the critical angle.

(A) I and III only (B) II and IV only (C) III and IV only (D) I and IV only

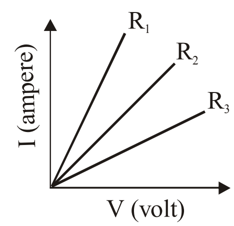
5. The speed of light in vacuum is 3.0×10^8 m/s. If the refractive index of a transparent liquid is 4/3, then the speed of light in the liquid is

(A) 2.25×10^8 m/s (B) 3×10^8 m/s (C) 4×10^8 m/s (D) 4.33×10^8 m/s

6. The refractive indices of water and glass are 4/3 and 3/2 respectively. The refractive index of water with respect to glass is

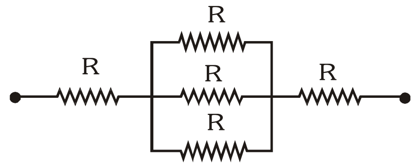
(A) $\frac{8}{9}$ (B) 2 (C) $\frac{2}{3}$ (D) $\frac{1}{6}$

7. A student carries out an experiment and plots the V-I graph of three samples of nichrome wire with resistances R_1, R_2 and R_3 respectively. Which of the following is true?



(A) $R_1 = R_2 = R_3$ (B) $R_1 > R_3 > R_3$ (C) $R_3 > R_2 > R_1$ (D) $R_2 > R_3 > R_1$

8. The resistance between points A and B in Fig. is :-



(A) $\frac{7}{3}$R (B) 3R (C) 5R (D) $\frac{4}{3}$R

9. A letter 'A' is constructed of a uniform wire of resistance 1 ohm per cm. The sides of the letter are 20 cm and the cross piece in the middle is 10 cm long. The resistance between the ends of the legs will be

(A) 32.4 ohm (B) 28.7 ohm (C) 26.7 ohm (D) 24.7 ohm

10. The following reaction $4HN_3(g)+5O_2(g) \to 4NO(g)+6H_2O(g)$ is an example of a :

(i) Displacement reaction (ii) Combination reaction

(iii) Redox reaction (iv) Neutralisation reaction

(A) (i) and (iv) (B) (ii) and (iii) (C) (i) and (iii) (D) (iii) and (iv)

11. Which among the following is (are) double displacement reaction(s)?

(i) $Pb+CuCl_2 \to PbCl_2+Cu$ (ii) $Na_2SO_4+BaCl_2 \to BaSO_4+2NaCl$

(iii) $C+O_2 \to CO_2$ (iv) $CH_4+2O_2 \to CO_2+2H_2O$

(A) (i) and (iv) (B) (ii) only (C) (i) and (ii) (D) (iii) and (iv)

12. Electrolysis of water is decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is :

(A) 1:1 (B) 2:1 (C) 4:1 (D) 1:2

13. In the double disaplacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?

(A) Lead sulphate (insolube) (B) Lead acetate

(C) Ammonium nitrate (D) Potassium sulphate

14. Which of the following statements is true for acid?

(A) Bitter and change red litmus to blue (B) Sour and change red litmus to blue

(C) Sour and change blue litmus to red (D) Bitter and change blue litmus to red

15. Washing soda is :

(A) Na_2CO_3 (B) $Na_2CO_3.7H_2O$

(C) $Na_2.CO_3.10H_2O$ (D) $NaHCO_3.10H_2O$

16. n the reaction M + $O_2 \to MO_2$ (super oxide) the metal is

(A) Li (B) Na (C) K (D) Ba

17. Which compound is used in photography

(A) $AgNO_3$ (B) AgO (C) AgBr (D) AgCl

18. Carnallite is the mineral of

(A) Na (B) Ca (C) Mg (D) All of these

19. Which one of the following is true?

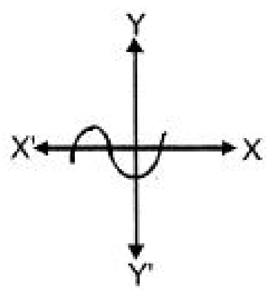
(A) π is a rational number

(B) All rational numbers are irrational number

(C) All real number can be represented on a number line

(D) $\frac{\sqrt{7}}{8}$ is a rational number

20. In figure, the graph of a polynomial $p(x)$ is shown. The number of zeroes of $p(x)$ is :



(A) 3 (B) 2 (C) 4 (D) 0

21. If $x = y$, $3x - y = 4$ and $x + y + z = 6$ then the value of z is

(A) 1 (B) 2 (C) 3 (D) 4

22. Which of the following equations has –1 as a root ?

(A) $x^2 + 3x - 10 = 0$ (B) $x^2 - x - 12 = 0$ (C) $3x^2 - 2x - 5 = 0$ (D) $9x^2 + 24x + 16 = 0$

23. p^{th} term of the series $\left(3-\frac{1}{n}\right)+\left(3-\frac{2}{n}\right)+\left(3-\frac{3}{n}\right)+........$ will be :

(A) $3 + \frac{p}{n}$ (B) $3 - \frac{p}{n}$ (C) $3 + \frac{n}{p}$ (D) $3 - \frac{n}{p}$

24. The points (0, –1), (– 2, 3), (6, 7) and (8, 3) are :

(A) Collinear

(B) Vertices of a parallelogram which is not a rectangle

(C) Vertices of a rectangle, which is not a square

(D) None of these

25. If the points (k, 2k), (3k, 3k) and (3, 1) are collinear, then the value of k is :

(A) $\frac{7}{9}$ (B) $\frac{2}{3}$ (C) $\frac{-2}{3}$ (D) $\frac{-1}{3}$

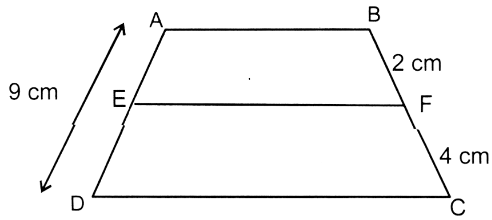
26. If $\tan\theta = 4$, then $\left(\dfrac{\tan\theta}{\dfrac{\sin^3\theta}{\cos\theta} + \sin\theta\cos\theta}\right)$ is equal to :

(A) 0 (B) $2\sqrt{2}$ (C) $\sqrt{2}$ (D) 1

27. The angle of elevation of the top of a tower as observed from a point on the horizontal ground is 'x'. If we move a distance 'd' towards the foot of the tower, the angle of elevation increases to 'y', then the height of the tower is :

(A) $\dfrac{d\tan x\tan y}{\tan y - \tan x}$ (B) d(tan y + tan x) (C) d(tan y – tan x) (D) $\dfrac{d\tan x\tan y}{\tan y + \tan x}$

28. In figure, ABCD is a trapezium in which AB || EF || DC. The length of AE is



(A) 2 cm (B) 3 cm (c) 4 cm (D) 7 cm

Directions (Q.29): In the following question there is a specific relation between the first and second term. The same relationship exist between third and fourth term. Understanding the relationship find out the correct alternative to replace the question mark.

29. 25 : 100 : : 81 : ?

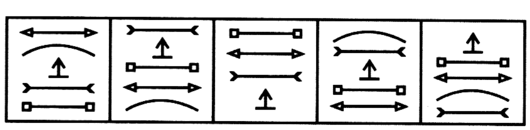
(A) 648 (B) 468 (C) 864 (D) 684

Directions (Q.30): Choose the number pair/group which is different from others.

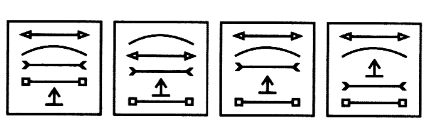
30. (A) (18, 45) (B) (23, 14) (C) (29, 82) (D) (36, 27)

Directions (Q.31): Each of the following questions consists of five figures called the problem figures; followed by four other figures marked A, B, C, D called the answer figures. Select a figure which will continue the same series as established by the five problem figures.

31. **Problem Figure**



Answer Keys



A B C D

32. In a certain language, FLOWER is coded on VOLDVI, then how is TERMINAL code in that language?
(A) FLKPMROZ (B) GVINRMZO
(C) RVNIGLKA (D) MNIVGYEO

Directions (for Q. 33) : In each of the following questions, a number / alphabet / alpha-numeric series is given wtih one term missing. Choose the correct alternative that will continue the same pattern and replace the question mark in the given series.

33. 12, 37, 43, 92, 100, ?
(A) 132 (B) 181 (C) 158 (D) 164

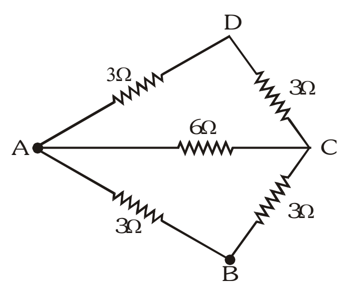
34. If 'when' stands for '×', 'you' stands for '÷', 'come' stands for '-' and 'will' stands for '+', then what will be the value of "8 when 12 will 16 you 2 come 10"?
(A) 45 (B) 86 (C) 94 (D) 99

35. 6 × 4 + 2 = 16
(A) × to ÷, 2 and 4 (B) + and ×, 2 and 6 (C) - to +, 2 and 6 (D) × to +, 4 and 6

SECTION - II

This section contains **5 multiple choice questions**. Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE OR MORE THAN ONE** choice(s) is/are correct. Each question carries **+4 makrs** for correct answer.

36. The effective resistance between the points A and B in the figure is :-



(A) 5W (B) 2W (C) 3W (D) 4W

37. Identify the correct representation of reaction occuring during chloralkali process.

(A) $2NaCl(l) + 2H_2O(l) \to 2NaOH(l) + Cl_2(g) + H_2(g)$

(B) $2NaCl(aq) + 2H_2O(aq) \to 2NaOH(aq) + Cl_2(g) + H_2(g)$

(C) $2NaCl(aq) + 2H_2O(l) \to 2NaOH(l) + Cl_2(g) + H_2(g)$

(D) $2NaCl(aq) + 2H_2O(l) \to 2NaOH(aq) + Cl_2(g) + H_2(g)$

38. Match the column

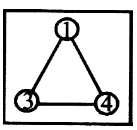
(i) $2x+5y=10$ $3x+4y=7$	(A) Unique solution
(ii) $2x+5y=10$ $6x+15y=20$	(B) Infinetly many solution
(iii) $5x+2y=10$ $10x+4y=20$	(C) No solution

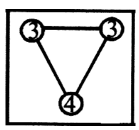
(A) (i) – A,(ii) – B,(iii) – C
(B) (i) – B, (ii) – C, (iii) – A
(C) (i) – A, (ii) – C, (iii) – B
(D) (i) – C, (ii) – A, (iii) – B

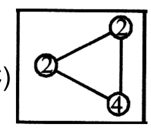
39. Along a road lie an odd number of stones placed at intervals of 10 metre. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. If a man starts from one of the end stones, and by carrying them in succession he covers 3 km to pile all stones at the centre. The number of stones is then :

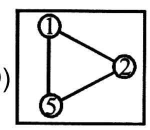
(A) 12 (B) 15 (C) 30 (D) 25

Directions (Q.40): In Question three are four figures given in each. One of these figures does not correlate with the rest of the figures. Select that odd figure.

40. (A) 

(B) 

(C) 

(D) 

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