Scholars Super-30: IIT-JEE

Sample Admission Test Paper

Roll No.:

Student's Name:

MAXIMUM TIME: 90 MINUTES

MAXIMUM MARKS: 45

INSTRUCTIONS

1. Please **DO NOT OPEN** the contest booklet until the proctor has given permission to start.

2. There are 45 questions in this paper.

3. There are four Sections in this paper. **Section-1 (MAT):**15 Objective Type Questions. **Section-2 (CHEMISTRY) :**10 Objective Type Questions. **Section-3 (PHYSICS) :**10 Objective Type Questions.**Section-4 (MATHEMATICS) :**10 Objective Type Questions.

3. All questions are compulsory.

4. No electronic devices capable of storing and displaying visual information are allowed during the exam.

5. Use of **calculator** is strictly prohibited in the exam.

6. Fill your **Name, Roll No., Grade and School Name** in the answer sheet.

<div style="text-align:center">

SECTION – 1 (MAT)

</div>

CHOOSE THE CORRECT ANSWER   **[15x1=15]**

1. If in a certain language 'CLOCK' is written as 'MDNKD', then how 'PRESENT' will be coded in that language.

   (a) FOSQRUT   (b) FSQRUOF

   (c) FSQRUMF   (d) FSQROMF

2. Find the question mark in the following figure

150	7
157	23
180	−38
?	0

   (a) 190   (b) 152

   (c) 142   (d) 228

3. Which group of letters is different from others?

   (a) PQSRT   (b) ABDCE

   (c) MNPOQ   (d) EFGHI

4. In the given question, choose the correct alternate to complete the series.

   r _ t _ v _ s _ u _ rs _ u _

   (a) stvtvru   (b) surtvtv   (c) rutvstu   (d) sturvvv

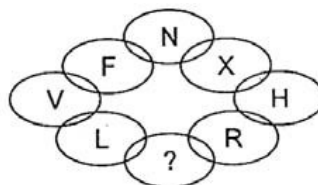5. Find the next number in the series.

   1, 8, 9, 64, 25, 216, 49,?

   (a) 265   (b) 512   (c) 343   (d) 215

6. Choose the correct alternative which replaces the question mark.

   1, 0, 2, −1, 3, −2, 4,?

   (a) 3   (b) −3   (c) −4   (d) 5

7. Insert the missing letter in the diagram below.

   (a) C   (b) B   (c) Z   (d) A

8. In a question, 55 + 10 = 20 and 45 + 40 = 49, then how 95 + 70 = ?

   (a) 165   (b) 84   (c) 155   (d) 48

9. Which letter will replace the question mark from given alternatives?

D		H
K	M	X
G		P

M		J
R	B	P
E		F

L		C
S	G	L
G		I

N		U
O	?	W
A		B

(a) H   (b) I   (c) J   (d) K

Direction (10-11): Find the statement which is true according to the given information below.

10. On weekends, Mr Sanchez spends many hours working in his vegetable and flower gardens. Mrs Sanchez spends her free time reading and listening to classical music. Both Mr Sanchez and Mrs Sanchez like to cook.

    (a) Mr Sanchez enjoys planting and growing vegetables

    (b) Mr Sanchez does not like classical music

    (c) Mrs Sanchez cooks the vegetables that Mr Sanchez grows

    (d) Mrs Sanchez enjoys reading nineteen century novels

11. Georgia is older than her cousin Marsha. Marsha's brother bart is older than Georgia. When Marsha and bart are visiting with Georgia, all three like to play a game of Monopoly. Marsha wins more often than Georgia does.

    (a) When he plays Monopoly with Marsha and Georgia, Bart often loses

    (b) Of the three, Georgia is the oldest

    (c) Georgia hates to lose at Monopoly

    (d) Of the three, Marsha is the youngest

12. On the basis of three position of dice, which number will appear on the face opposite the number 6?

    (i) 4, 3, 6   (ii) 4, 5, 6   (iii) 1, 4, 5
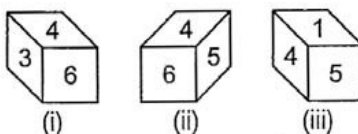
    (a) 3   (b) 2   (c) 1   (d) 5

13. Identify which alternate can replace the question mark?

1	
9	25
49	
121	
?	

    (a) 165   (b) 169   (c) 167   (d) 144

14.   In the given figure, triangle represents 10th passed students, square represents 12th passed students and circle represents those students who are pursuing graduation. How many students are 10th and 12th passed but not pursuing graduation in the given figure?
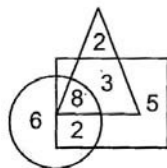
(a) Only 2   (b) Only 5   (c) Only 3   (d) Only 6

15.   Which of the following is the mirror image of 'CORDIAL', if the mirror is placed below the word?

(a) CORDIAL   (b) CORDIAL   (c) CORLDIA   (d) CORDIAL

SECTION – 2 (CHEMISTRY)

CHOOSE THE CORRECT ANSWER   **[10 x 1=10]**

16. $2NaOH + MgSO_4 \longrightarrow ?$

(a) $MgO + Na_2SO_4$ (b) $Mg(OH)_2 + Na_2SO_4$

(c) $Mg(OH)_2 + Na_2O$ (d) $MgO + Na_2O$

17. $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$ is :

(a) combination reaction   (b) decomposition reaction

(c) displacement reaction   (d) double displacement reaction

18.   Zinc can displace copper from copper sulphate solution because zinc is :

(a) more reactive than copper   (b) less reactive than copper

(c) more stable than copper   (d) less stable than copper

19.   pH + pOH =

(a) 14   (b) 7   (c) 6   (d) 0

20.   Plaster of Paris has the formula:

(a) $CaSO_4.\frac{1}{2}H_2O$ (b) $CaSO_4.H_2O$ (c) $CaSO_4.1\frac{1}{2}H_2O$ (d) $CaSO_4.2H_2O$

21.   The formula of Silver Phosphate is:

(a) $AgPO_4$ (b) Ag_3PO_4 (c) $Ag_2(PO_4)_3$ (d) Ag_2PO_4

22.   Gypsum is added to cement because:

(a) it makes the cement very hard

(b) it increases the pace of setting of cement

(c) it slows down the initial setting of cement when water is added

(d) none of the above

23. A mineral is known as ore if metal

   (a) cannot be produced from it   (b) can be produced from it

   (c) can be extracted from it profitably   (d) is very costly

24. Soft drinks contain:

   (a) acetic acid   (b) tartaric acid   (c)carbonic acid   (d) nitric acid

25. The formula of Oleum is:

   (a) H_2SO_4 (b) $H_2S_2O_7$ (c) $H_2S_2O_3$ (d) $H_2S_2O_6$

SECTION – 3 (PHYSICS)

CHOOSE THE CORRECT ANSWER   **[10 x 1=10]**

26. An observer moves in a perpendicular direction to the normal of a stationary plane mirror at a speed of 4 m s^{-1}. The speed of image with respect to mirror is _____ .

   (a) 0 m s^{-1} with respect to the mirror   (b) 4 m s^{-1} towards the mirror

   (c) 4 m s^{-1} away from the mirror   (d) 4 m s^{-1} parallel to the mirror

27. The refractive index of diamond is 2.4. If the velocity of light in air or vacuum is $3 \times 10^8 \text{ m s}^{-1}$, then the velocity of light in diamond is $5A \times 10^8 \text{ m s}^{-1}$. Find value of A?

   (a) 1.25   (b) 0.25   (c) 0.16   (d) 0.8

28. A convex mirror is used

   (a) by a dentist

   (b) for shaving

   (c) as a rear-view mirror in vehicles

   (d) as a light reflector for obtaining a parallel beam of light

29. Quantum theory of light was given by:

   (a) Newton   (b) Plank   (c) Faraday   (d) None of these

30. Three resistance each of 8Ω are connected to a triangle. The resistance between any two terminal:

   (a) 12Ω (b) 2Ω (c) 6Ω (d) $\dfrac{16}{3}\Omega$

31. The image formed by retina of human eye is

   (a) Virtual and erect   (c) Virtual and inverted

   (b) Real and inverted   (d) Real and erect

32. A car starts from rest requires a velocity v with uniform acceleration 2m/s^2 then it comes to stop with uniform retardation 4m/s^2. If the total time for which it remains in motion is 3 sec, the total distance travelled is:

   (a) 2m   (b) 3m   (c) 4m   (d) 6m

33. The time period of artificial satellite in a circular orbit of radius R is T. The radius of the orbit in which time period is 8T is.

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

34. When a man increases his speed by 2m/s, he finds that his kinetic energy is doubled, the original speed of the man is:

    (a) $\sqrt{2}(2-1)$ m/s   (b) $\sqrt{2}(2+1)$ m/s   (c) 4.5 m/s   (d) none of these

35. Find the incorrect statements related to the rainbow

    (a) The rainbow is formed in the same direction to the position of the sun

    (b) When the light rays undergo dispersion and total internal reflection, the water droplets present in the atmosphere forms rainbow

    (c) A rainbow is formed in the shape of circle

    (d) When light rays undergo one internal reflection and two refractions produce primary rainbow whereas two internal reflections and two refractions produces secondary rainbow

SECTION – 4 (MATHEMATICS)

CHOOSE THE CORRECT ANSWER   **[10 x 1=10]**

36. X is a two-digit number; Y is a natural number more than 36. If 1/X + 2/Y = 1/18. How many possibilities exist for (X, Y)?

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

37. If $\log_3 2$, $\log_3 (2^x - 5)$ and $\log_3 (2^x - 7/2)$ are in arithmetic progression, then value of x is.

    (a) 1   (b) 2   (c) 3   (d) 4

38. When 3^{2015} is divided by 4, then the remainder is

    (a) 1   (b) 2   (c) 3   (d) 4

39. If one of the zeroes of the cubic polynomial $x^3 + ax^2 + bx + x$ is – 1, then the product of other two zeroes is:

    (a) b – a + 1   (b) b – a – 1   (c) a – b+ 1   (d) a – b – 1

40. The sum of the first n terms of an A.P. is given by $3n^2 – 5n$. Then the 18th term of the A.P. is

    (a) 100   (b) 102   (c) 104   (d) 106

41. The length of AD is

    (a) $\sqrt{pq}$ units   (b) $\dfrac{\sqrt{pq}}{2}$ units

    (c) p + q units   (d) $\dfrac{p+q}{2}$
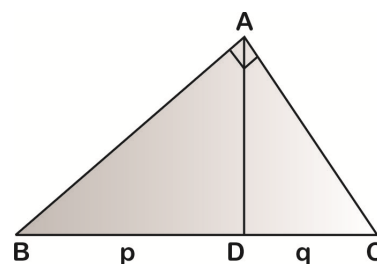
42. The number $1 + 3 + 3^3 + ... + 3^{23}$ is divisible by exactly two numbers between 724 and 734. What are they?

    (a) 728 and 730   (b) 726 and 728   (c) 726 and 730   (d) 730 and 732

43. If $x^y = y^x$, then $\left(\dfrac{x}{y}\right)^{x/y}$ is equal to

    (a) $x^{x/y+1}$ (b) $x^{1/y}$ (c) $x^{1/x}$ (d) $x^{x/y-1}$

44. If the mean of the data 21, 25, 17, $(x + 3)$, 19, $(x - 4)$ is 18, then find the mode of the data.

    (a) 14   (b) 15   (c) 16   (d) 17

45. The sum of a certain number of positive integers is 31. What is the biggest their product can be?

    (a) 55296   (b) 78732   (c) 118098   (d) 49152

$$* * *$$