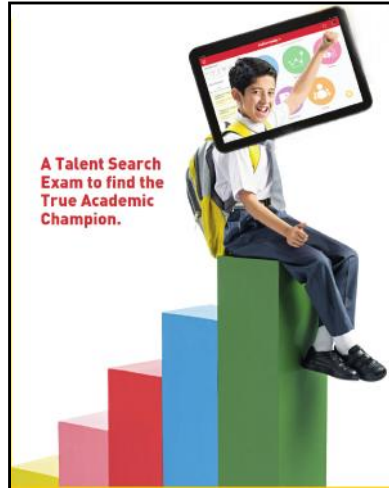


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SAMPLE QUESTIONS

for

CLASS XII-NM

Name : _____

School Name : _____

Contact No. : _____



Contact us at :

Campus Chandigarh : SCO No.-350,351 & 352, Sector 34A, Tel. 0172-4612029, 8556015577

Campus Panchkula : SCO-264, 2nd Floor, Sector-14, Tel. 0172-4004028, 4005028

Campus Patiala : SCF 99-102, Chotti Barandari. Tel. 0175-5012029, 5012030

INSTRUCTIONS

Time duration: 1:00 hr. (Time of OMR filling is included in time duration).

Maximum Marks: 240

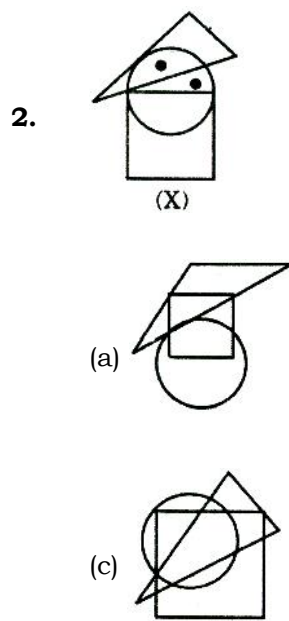
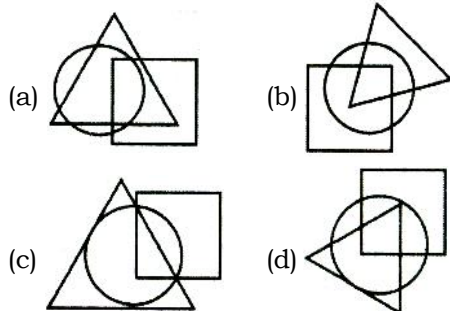
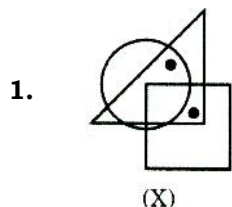
This Paper contains 60 questions divided in three sections

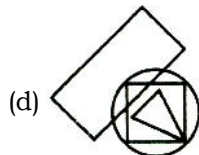
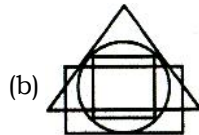
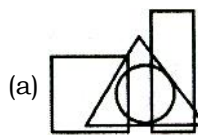
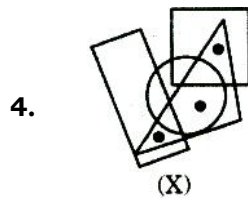
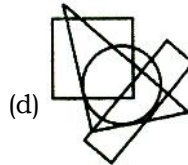
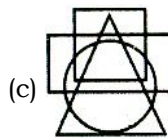
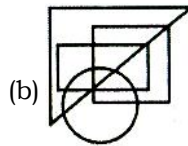
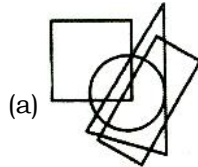
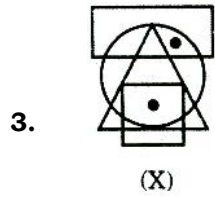
Section-A	MAT	30 questions	120 marks
Section-B	Physics	10 questions	40 marks
Section-C	Chemistry	10 questions	40 marks
Section-D	Mathematics	10 questions	40 marks

Each Question has a single correct answer.

Marking Scheme: +4 marks for correct answers. There is **NO NEGATIVE MARKING**

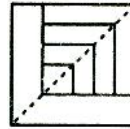
SECTION-A (MAT)
MENTAL APTITUDE



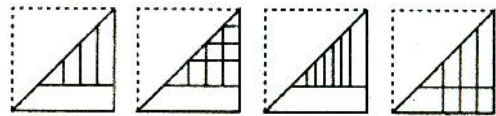


Directions (Q. no. 5 to 21): In each of the following problems, a square transparent sheet with a pattern is given. Figure out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.

5. Transparent Sheet

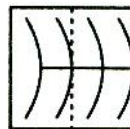


Response Figures

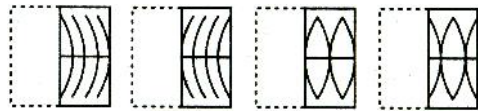


(a) (b) (c) (d)

6. Transparent Sheet

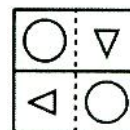


Response Figures

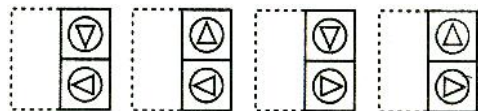


(a) (b) (c) (d)

7. Transparent Sheet

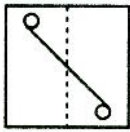


Response Figures

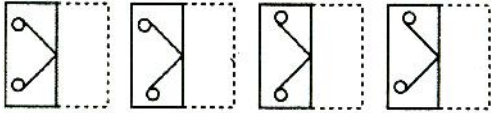


(a) (b) (c) (d)

8. Transparent Sheet

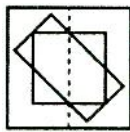


Response Figures

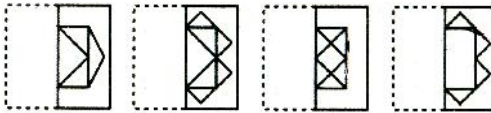


(a) (b) (c) (d)

9. Transparent Sheet

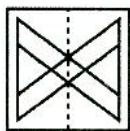


Response Figures

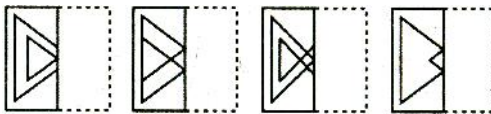


(a) (b) (c) (d)

10. Transparent Sheet

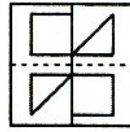


Response Figures

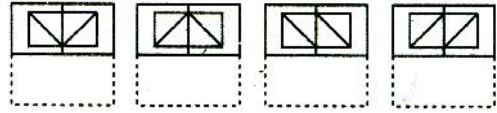


(a) (b) (c) (d)

11. Transparent Sheet

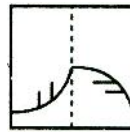


Response Figures



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

12. Transparent Sheet

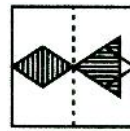


Response Figures

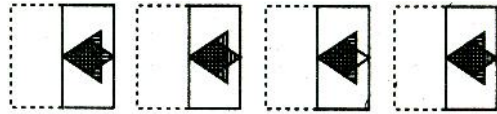


(a) (b) (c) (d)

13. Transparent Sheet

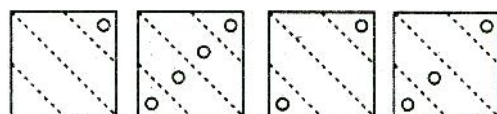
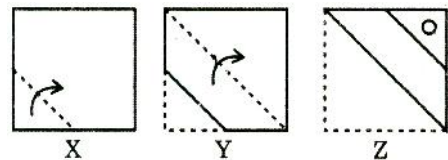


Response Figures

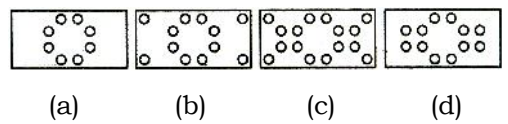
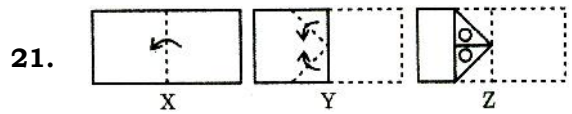
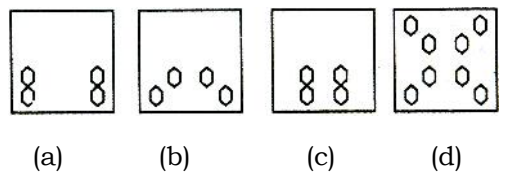
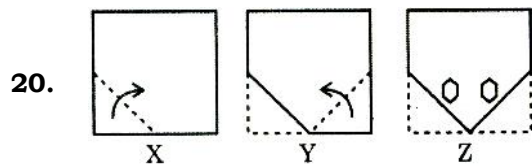
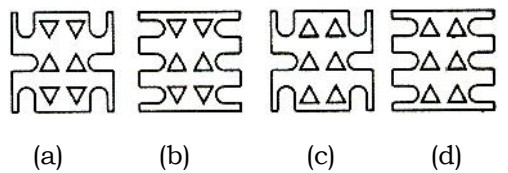
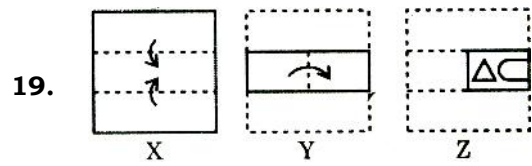
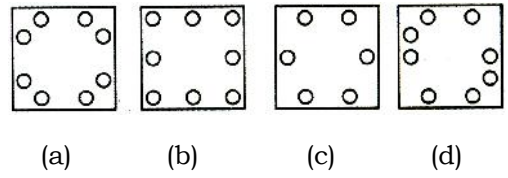
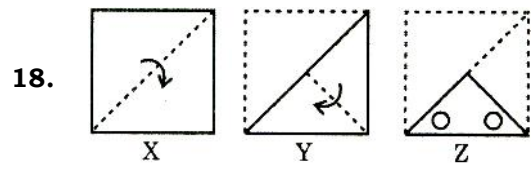
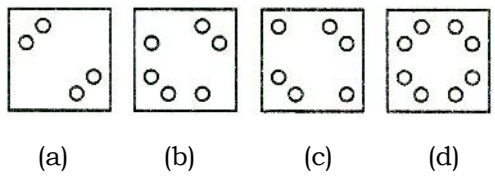
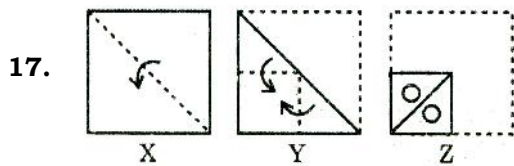
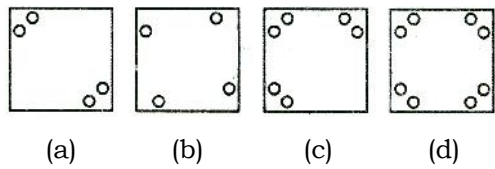
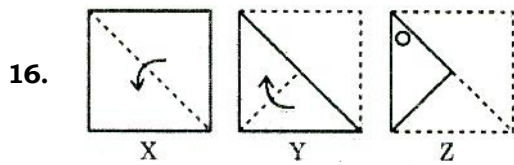
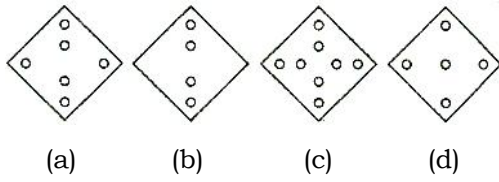
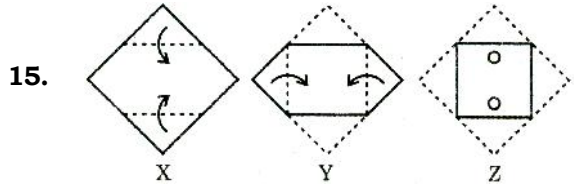


(a) (b) (c) (d)

14.



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



Directions (Q. no. 22 to 30) : In each of the following questions, arrange the given words in a meaningful sequence and then choose the most appropriate sequence from amongst the alternatives provided below each question :

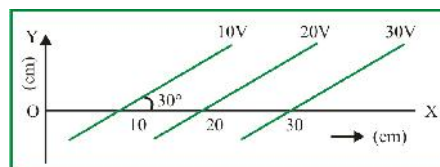
- 22.** 1. Honey 2. Flower
3. Bee 4. Wax
(a) 1, 3, 4, 2 (b) 2, 1, 4, 3
(c) 2, 3, 1, 4 (d) 4, 3, 2, 1
- 23.** 1. Site 2. Plan
3. Rent 4. Money
5. Building 6. Construction
(a) 1, 2, 3, 6, 5, 4 (b) 2, 3, 6, 5, 1, 4
(c) 3, 4, 2, 6, 5, 1 (d) 4, 1, 2, 6, 5, 3
- 24.** 1. Reading 2. Composing
3. Writing 4. Printing
(a) 1, 3, 2, 4 (b) 2, 3, 4, 1
(c) 3, 1, 2, 4 (d) 3, 2, 4, 1
- 25.** 1. Sentence 2. Chapter
3. Letter 4. Book
5. Word 6. Paragraph
(a) 4, 2, 1, 6, 5, 3 (b) 4, 2, 6, 1, 5, 3
(c) 4, 6, 1, 2, 3, 5 (d) 4, 6, 2, 5, 1, 3

- 26.** 1. Cut 2. Put on
3. Mark 4. Measure
5. Tailor
(a) 1, 2, 3, 4, 5 (b) 2, 4, 3, 1, 5
(c) 3, 1, 5, 4, 2 (d) 4, 3, 1, 5, 2
- 27.** 1. Police 2. Punishment
3. Crime 4. Justice
5. Judgement
(a) 1, 2, 3, 4, 5 (b) 3, 1, 2, 4, 5
(c) 3, 1, 4, 5, 2 (d) 5, 4, 3, 2, 1
- 28.** 1. Country 2. Furniture
3. Forest 4. Wood
5. Trees
(a) 1, 3, 5, 4, 2 (b) 1, 4, 3, 2, 5
(c) 2, 4, 3, 1, 5 (d) 5, 2, 3, 1, 4
- 29.** 1. Elephant 2. Cat
3. Mosquito 4. Tiger
5. Whale
(a) 1, 3, 5, 4, 2 (b) 2, 5, 1, 4, 3
(c) 3, 2, 4, 1, 5 (d) 5, 3, 1, 2, 4
- 30.** 1. Key 2. Door
3. Lock 4. Room
5. Switch on
(a) 1, 2, 3, 5, 4 (b) 1, 3, 2, 4, 5
(c) 4, 2, 1, 5, 3 (d) 5, 1, 2, 4, 3

SECTION-B

PHYSICS

- 31.** If potential $V = xy$, then find work done to move $2C$ charge from $A(2, 2)$ to $B(-1, -1)$.
- (a) $+6J$ (b) $+5J$
(c) $+3J$ (d) $-3J$
- 32.** A particle of mass m and charge q is placed at rest in a uniform electric field E and then released. The kinetic energy attained by the particle after moving a distance y is
- (a) qEy^2 (b) qE^2y
(c) qEy (d) q^2Ey
- 33.** Let V and E be the potential and electric field respectively at a point due to charge distribution. Which of the following assertion is true.
- (a) if $V = 0$ then E must be zero
(b) $V \neq 0$, then E can not be zero
(c) if $E \neq 0$, V can not be zero
(d) if $V = 0$, E may be zero
- 34.** A point charge Q is moved along a circular path around another fixed point charge. The work done is zero
- (a) only if Q returns to its starting point
(b) only if the two charges have the same magnitude
(c) only if the two charges have the same magnitude and opposite signs
(d) in all cases
- 35.** Two positively charged particles X and Y are initially far away from each other and at rest. X begins to move towards Y with some initial velocity. The total momentum and energy of the system are p and E .
- (a) If Y is fixed, both p and E are conserved.
(b) If Y is fixed, E is conserved, but not p .
(c) If both are free to move, p is conserved but not E .
(d) If both are free, E is conserved, but not p .
- 36.** Equipotential surfaces are shown in figure. Then the electric field strength will be



- (a) 100 Vm^{-1} along X-axis
(b) 100 Vm^{-1} along Y-axis
(c) 200 Vm^{-1} at an angle 120° with X-axis
(d) 50 Vm^{-1} at an angle 120° with X-axis

- 37.** An arc of radius r carries charge. The linear density of charge is λ and the arc subtends an angle $\pi/3$ at the centre. What is electric potential at the centre
- (a) $\frac{\lambda}{4\epsilon_0}$ (b) $\frac{\lambda}{8\epsilon_0}$
 (c) $\frac{\lambda}{12\epsilon_0}$ (d) $\frac{\lambda}{16\epsilon_0}$
- 38.** A thin conducting ring of radius r has an electric charge $+Q$, if a point charge q is placed at the centre of the ring, then tension of the wire of ring will be
- (a) $\frac{Qq}{8\pi\epsilon_0 r^2}$ (b) $\frac{Qq}{4\pi\epsilon_0 r^2}$
 (c) $\frac{Qq}{8\pi^2\epsilon_0 r^2}$ (d) $\frac{Qq}{4\pi^2\epsilon_0 r^2}$
- 39.** Eight oil drops of same size are charged to a potential of 50 V each. These oil drops are merged into one single large drop. What will be the potential of the large drop ?
- (a) 50 V (b) 100 V
 (c) 200 V (d) 400 V
- 40.** Two identical thin rings, each of radius R metres, are coaxially placed a distance R metres apart. If Q_1 coul, and Q_2 coul, are respectively the charges uniformly spread on the two rings, the work done in moving a charge q from the centre of one ring to that of the other is :
- (a) zero
 (b) $\frac{q(Q_1 - Q_2)(\sqrt{2} - 1)}{(4\sqrt{2}\pi\epsilon_0 R)}$
 (c) $\frac{q\sqrt{2}(Q_1 - Q_2)}{(4\pi\epsilon_0 R)}$
 (d) $\frac{q(Q_1 + Q_2)(\sqrt{2} + 1)}{(4\sqrt{2}\pi\epsilon_0 R)}$

SECTION-C CHEMISTRY

- 41.** What will be the mole fraction of ethanol in a sample of spirit containing 85% ethanol by mass ?
 (a) 0.69 (b) 0.82
 (c) 0.85 (d) 0.60
- 42.** The normality of 1 M H_3PO_4 is
 (a) 1 N (b) 0.5 N
 (c) 2 N (d) 3 N
- 43.** Mixture of volatile components A and B has total vapour pressure (in torr) :

$$P_{\text{Total}} = 254 - 119x_A$$

where x_A is mol fraction of A in mixture.

Hence P_A^0 and P_B^0 are (in torr) :

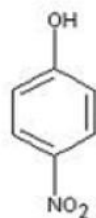
- (a) 254,119 (b) 119,254
 (c) 135,254 (d) 154,119
- 44.** The vapour pressure of water at room temperature is 23.8 mm Hg. The vapour pressure of an aqueous solution of sucrose with mole fraction 0.1 is equal to
 (a) 23.9 mm Hg (b) 24.2 Hg
 (c) 21.42 mm Hg (d) 20.44 mm Hg.
- 45.** Match the column I with column II and mark the appropriate choice.

Column I

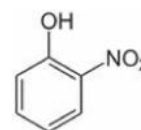
Column II

- (A) $\Delta H_{\text{mix}} = 0, \Delta V_{\text{mix}} = 0$ (i) Non-ideal solution
 (B) $\Delta H_{\text{mix}} \neq 0, \Delta V_{\text{mix}} \neq 0$ (ii) Positive deviation
 (C) $\Delta H_{\text{mix}} < 0, \Delta V_{\text{mix}} < 0$ (iii) Ideal solution
 (D) $\Delta H_{\text{mix}} > 0, \Delta V_{\text{mix}} > 0$ (iv) Negative deviation
- (a) (A) \rightarrow (i), (B) \rightarrow (iii), (C) \rightarrow (ii), (D) \rightarrow (iv)
 (b) (A) \rightarrow (iii), (B) \rightarrow (i), (C) \rightarrow (iv), (D) \rightarrow (ii)
 (c) (A) \rightarrow (ii), (B) \rightarrow (iii), (C) \rightarrow (iv), (D) \rightarrow (i)
 (d) (A) \rightarrow (iii), (B) \rightarrow (i), (C) \rightarrow (ii), (D) \rightarrow (iv)

- 46.** Which of the following liquid pairs shows a positive deviation from Raoult's law ?
 (a) Water—hydrochloric acid
 (b) Benzene—methanol
 (c) Water—nitric acid
 (d) Acetone—chloroform
- 47.** Out of the compounds below the vapour pressure of (B) at a particular temperature is

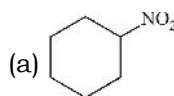


(A)

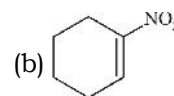


(B)

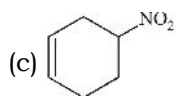
- (a) Higher than that of (A)
 (b) Lower than that of (A)
 (c) Higher or lower than (A), depending on the size of the vessel
 (d) Same as that of (A)
- 48.** Molarity of liquid HCl of 36.5% w/w, if the density of solution is 1.17 g/cc is
 (a) 36.5 (b) 18.25
 (c) 11.7 (d) 42.10
- 49.** 5 L of a solution contains 25 mg of $CaCO_3$. What is its concentration in ppm ?
 (a) 25 (b) 1
 (c) 5 (d) 2500
- 50.** Inductive effect of $-NO_2$ group operates in



(a)



(b)



(c)

(d) all of these

SECTION-D MATHEMATICS

- 51.** The value of the determinant $\Delta = \begin{vmatrix} 1! & 2! & 3! \\ 2! & 3! & 4! \\ 3! & 4! & 5! \end{vmatrix}$ is
- (a) $2!$ (b) $3!$
(c) $4!$ (d) $5!$
- 52.** If $\begin{vmatrix} 6i & -3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{vmatrix} = x + iy$, then (x, y) is
- (a) $(3, 1)$ (b) $(1, 3)$
(c) $(0, 3)$ (d) $(0, 0)$
- 53.** If $f(x) = \begin{vmatrix} a & -1 & 0 \\ ax & a & -1 \\ ax^2 & ax & a \end{vmatrix}$, then $f(2x) - f(x)$ is equal to
- (a) ax (b) $ax(2a + 3x)$
(c) $ax(2 + 3x)$ (d) none of these
- 54.** If ω be imaginary cube root of unity,
- then $\begin{vmatrix} \lambda+1 & \omega & \omega^2 \\ \omega & \lambda+\omega^2 & 1 \\ \omega^2 & 1 & \lambda+\omega \end{vmatrix}$ is equal to
- (a) 0 (b) $\lambda^3 + 1$
(c) λ^3 (d) none of these
- 55.** If $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$, then
- (a) AB, BA exist and are equal
(b) AB, BA exist but not equal
(c) AB exist and BA does not exist
(d) AB does not exist and BA exists
- 56.** R is a relation on the set Z of integers and it is given by
- $xRy \Leftrightarrow |x - y| \leq 1$. Then, R is
- (a) reflexive and transitive
(b) reflexive and symmetric
(c) symmetric and transitive
(d) an equivalence relation
- 57.** The function $f : \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = (x-1)(x-2)(x-3)$ is
- (a) one-one but not onto
(b) onto but not one-one
(c) both one and onto
(d) neither one-one nor onto
- 58.** $f : \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = \frac{e^{x^2} - e^{-x^2}}{e^{x^2} + e^{-x^2}}$ is
- (a) one-one but not onto
(b) many-one but onto
(c) one-one and onto
(d) neither one-one nor onto
- 59.** Let $f(x) = x^2$ and $g(x) = 2^x$. Then the solution set of the equation $f \circ g(x) = g \circ f(x)$ is
- (a) \mathbb{R} (b) $\{0\}$
(c) $\{0, 2\}$ (d) none of these
- 60.** The inverse of the function $f : \mathbb{R} \rightarrow (-1, 1)$ given by $f(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}$ is
- (a) $\frac{1}{2} \log \frac{1+x}{1-x}$ (b) $\frac{1}{2} \log \frac{2+x}{2-x}$
(c) $\frac{1}{2} \log \frac{1-x}{1+x}$ (d) None of these

Dream on !!



SECTION-A (MAT)
MENTAL APTITUDE

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (a) | 2. (c) | 3. (d) | 4. (a) | 5. (a) |
| 6. (c) | 7. (c) | 8. (c) | 9. (b) | 10. (b) |
| 11. (a) | 12. (d) | 13. (d) | 14. (a) | 15. (b) |
| 16. (a) | 17. (d) | 18. (a) | 19. (b) | 20. (b) |
| 21. (a) | 22. (c) | 23. (d) | 24. (d) | 25. (b) |
| 26. (d) | 27. (c) | 28. (a) | 29. (c) | 30. (b) |

SECTION-B
PHYSICS

- | | | | | |
|---------|---------|---------|---------|---------|
| 31. (a) | 32. (c) | 33. (d) | 34. (d) | 35. (b) |
| 36. (c) | 37. (c) | 38. (c) | 39. (c) | 40. (b) |

SECTION-C
CHEMISTRY

- | | | | | |
|---------|---------|---------|---------|---------|
| 41. (a) | 42. (d) | 43. (c) | 44. (c) | 45. (b) |
| 46. (b) | 47. (a) | 48. (c) | 49. (c) | 50. (d) |

SECTION-D
MATHEMATICS

- | | | | | |
|---------|---------|---------|---------|---------|
| 51. (c) | 52. (d) | 53. (b) | 54. (c) | 55. (b) |
| 56. (b) | 57. (b) | 58. (d) | 59. (c) | 60. (a) |