

# PRACTICE PAPER - X

## MATHEMATICS

- The equation  $y = \sqrt{3}x$ ,  $y = 1$  are the sides of
  - an equilateral triangle
  - a right angled triangle
  - an isosceles triangle
  - an obtuse angled triangle
- The tangents to the circle  $x^2 + y^2 = 169$  at the points  $(5, 12)$  and  $(-5, -12)$  are
  - parallel
  - at right angles
  - inclined at an angle of  $45^\circ$
  - inclined at an angle of  $60^\circ$
- If the direction cosines of a straight line are  $< k, k, k >$ , then
  - $k > 0$
  - $0 < k < 1$
  - $k = 1$
  - $k = \frac{1}{\sqrt{3}}$  or  $-\frac{1}{\sqrt{3}}$
- Angle between the straight line  $\frac{x-1}{2} = \frac{y+3}{-1} = \frac{z-5}{2}$  and the plane  $4x - 2y + 4z = 9$  is
  - $60^\circ$
  - $90^\circ$
  - $45^\circ$
  - $30^\circ$
- The number of tangents to the circle  $x^2 + y^2 - 2x + 4y = 0$  through the point  $(-1, 2)$  is
  - 1
  - 2
  - 0
  - none of these
- The distance between the lines  $5x - 12y + 65 = 0$  and  $5x - 12y - 39 = 0$  is
  - 2
  - 8
  - 2
  - none of these
- Radius of the sphere through the points  $(4, 3, 0)$ ,  $(0, 4, 3)$ ,  $(0, 5, 0)$  and  $(4, 0, 3)$  is
  - 7
  - 5
  - $\frac{7}{5}$
  - none of these
- The medians AD and BE of a triangle with vertices at A  $(0, b)$ , B  $(0, 0)$  and C  $(a, 0)$  are perpendicular to each other if
  - $b = \sqrt{2}a$
  - $a = \sqrt{-2}b$
  - $b = \sqrt{-2}a$
  - $a = \pm \sqrt{2}b$
- The straight lines  $x + y = 0$ ,  $3x + y - 4 = 0$ ,  $x + 3y - 4 = 0$ , form a triangle which is
  - isosceles
  - equilateral
  - right angled
  - none of these
- If the two variables  $x$  and  $y$  have a perfect correlation (direction indirect), then they may be connected by a relation of the type
  - $xy = a^2$
  - $\frac{a}{x} + \frac{b}{y} = 1$
  - $\frac{x}{a} + \frac{y}{b} = 1$
  - none of these
- 25 % of the items of a data are less than 35 and 25% of the items are more than 75. Q. D of the data is
  - 55
  - 20
  - 35
  - 75
- The line passing through  $(1, 1)$  and parallel to the line  $2x - 3y + 5 = 0$  is
  - $3x + 2y = 5$
  - $2x - 3y + 1 = 0$
  - $3x - 2y = 1$
  - $2x + 3y = 5$
- The area of the triangle with vertices at the points  $(a, b + c)$ ,  $(b, c + a)$ ,  $(c, a + b)$  is
  - 0
  - $a + b + c$
  - $ab + bc + ca$
  - none of these
- Maximum and minimum magnitudes of resultant of two forces acting at a point are 18 and 4. The magnitudes of the two forces are
  - 11 and 7
  - 22 and 14
  - 9 and 2
  - none of these

15. Two forces P and Q act at a point along perpendicular directions; the magnitude of their resultant is
- (a)  $\sqrt{P^2+Q^2}$  (b) P + Q  
(c) |P - Q| (d) P - Q
16. A particle starts from rest with uniform acceleration and acquires a velocity of 40 m/sec in 10 seconds. The displacement of the particle at the end of 10 seconds is
- (a) 4 m (b) 200 m  
(c) 20 m (d) none of these
17. Forces of magnitudes 3N, 5N, and 7N acting at a point are in equilibrium. The angle between the directions of the first two forces is
- (a)  $90^\circ$  (b)  $120^\circ$   
(c)  $150^\circ$  (d)  $60^\circ$
18. A stone A is thrown vertically upwards with a velocity of 29.4 m/sec. After 4 seconds from the projection of A, another stone B is let fall from the same point. A will overtake B after
- (a) 1 (b) 2  
(c) 3 (d) 4 sec
19. Which of the following statements is correct?
- (a) Every L.P.P. has at least one optimal solution  
(b) Every L.P.P. has a unique optimal solution  
(c) If an L.P.P. has two optimal solutions, then it has infinitely many solutions  
(d) None of these
20. Decimal form of the numeral  $(100)_2$  is
- (a) 8 (b) 100  
(c) 4 (d) none of these
21. The number of significant digits in 0.0001 is
- (a) 5 (b) 4  
(c) 1 (d) none of these
22. If  $x^2 + y^2 = 1$ ;  $x, y \in \mathbb{R}$ , then  $(3x - 4x^3)^2 + (3y - 4y^3)^2$  is equal to
- (a) 1 (b) 3  
(c) 2 (d) none of these
23.  $1 + \cos^2 2A$  is equal to
- (a)  $\sin^4 A + \cos^4 A$  (b)  $\sin^4 2A$   
(c)  $2(\cos^4 A + \sin^4 A)$  (d) none of these
24. Which of the following functions is periodic?
- (a)  $[x] - x$  (b)  $\cos \frac{1}{2}$   
(c)  $x \cdot \sin x$  (d)  $[x] - x$
25.  $\tan^{-1} x + \tan^{-1} y = \tan^{-1} \left( \frac{x+y}{1-xy} \right)$  for
- (a) all  $x, y \in \mathbb{R}$  (b)  $|x| > 1, |y| > 1$   
(c)  $|x| < 1, |y| < 1$  (d)  $xy < 1$
26.  $3 \sin^{-1} x = \sin^{-1}(3x - 4x^3)$  holds good for all
- (a)  $|x| \leq 1$  (b)  $0 \leq x \leq 1$   
(c)  $|x| \leq \frac{1}{2}$  (d) none of these
27. If  $3 \sin \theta + 4 \cos \theta = 5$ , then the value of  $3 \cos \theta - 4 \sin \theta$  is equal to
- (a) 0 (b) -5  
(c) 5 (d) none of these
28. If  $f(x) = ax + b$  and  $g(x) = cx + d$ , then  $f(g(x)) = g(f(x))$  if and only if
- (a)  $f(a) = g(c)$   
(b)  $f(b) = g(d)$   
(c)  $f(a) = g(b)$   
(d)  $f(c) = g(a)$
29. If a function F is such that  $F(0) = 2, F(1) = 3, F(n+2) = 2F(n) - F(n+1)$  for  $n \geq 0$ , then  $F(5)$  is equal to
- (a) -7 (b) -3  
(c) 7 (d) 13
30. ABC is an equilateral triangle of each side a ( $> 0$ ). The inradius of the triangle is
- (a)  $\frac{a}{2}$  (b)  $\frac{a}{3}$   
(c)  $\frac{\sqrt{3}a}{3}$  (d)  $\frac{a}{2\sqrt{3}}$
31. The greatest angle of a cyclic quadrilateral is 3 times the least. The circular measure of the least angle is
- (a)  $45^\circ$  (b)  $\frac{\pi}{4}$   
(c)  $\frac{\pi}{3}$  (d) none of these
32. The domain of the function  $f(x) = (\log^*)^{3/2}$  is
- (a)  $(0, \infty)$  (b)  $[e, \infty)$   
(c)  $[10, \infty)$  (d)  $[1, \infty)$

33. Let A {1, 2, 3} and B {1, 2, 4}, then  
 $F = \{(1, 1), (1, 2), (2, 1), (3, 4)\}$  is a  
 (a) one-one function from A to B  
 (b) bijection from A to B  
 (c) surjection from A to B  
 (d) none of these
34.  $\sum_{n=12}^4 \sin\left(\frac{\pi}{2}\right)$  is equal to  
 (a)  $\frac{\sqrt{3}+1+\sqrt{2}}{2}$   
 (b)  $\frac{\sqrt{3}+\sqrt{2}+2}{\sqrt{2}}$   
 (c)  $\frac{\sqrt{3}+1-\sqrt{2}}{\sqrt{2}}$   
 (d)  $\frac{\sqrt{3}+\sqrt{2}+2}{2}$
35. Circular measure of an angle of 1 radian is  
 (a) 90 (b)  $\frac{\pi}{2}$   
 (c) 1 (d) none of these
36.  $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\tan x - 1}{x - \frac{\pi}{4}}$  is equal to  
 (a) 1 (b)  $\frac{1}{2}$   
 (c) 2 (d) 0
37.  $\frac{d}{dx}(\log |\tan \frac{x}{2}|)$  is equal to  
 (a)  $\frac{1}{\tan \frac{x}{2}}$  (b)  $\frac{2}{\sin x}$   
 (c) cosec x (d) none of these
38.  $\int_0^{\pi} \sqrt{1 - \cos x}$  is equal to  
 (a) 2 (b) 1  
 (c)  $2\sqrt{2}$  (d)  $\sqrt{2}$
39. If  $\int f(x)dx = f(x)$ , then  
 (a)  $f(x) = x$   
 (b)  $f(x) = \text{constant}$   
 (c)  $f(x) = 0$   
 (d)  $f(x) = e^x$
40. The function  $f(x) = \sum_{k=1}^5 (x-k)^2$  assumes minimum value of x given by  
 (a) 5 (b) 3  
 (c)  $\frac{5}{2}$  (d) 2
41. The curve  $y = x^{1/5}$  has at (0, 0)  
 (a) a vertical tangent  
 (b) a horizontal tangent  
 (c) oblique tangent  
 (d) no tangent
42.  $\int_0^1 e^{-\sin x} dx$  is equal to  
 (a) -1  
 (b) 2  
 (c)  $1 + \frac{1}{2}$   
 (d) none of these
43. If  $G(x) = \frac{1}{\sqrt{25-x^2}}$ , then  $\lim_{h \rightarrow 0} \frac{G(x+h) - G(x)}{h}$  has the value  
 (a)  $\frac{4}{9}$   
 (b)  $\frac{\pm 4}{3\sqrt{3}}$   
 (c)  $\frac{\pm 4}{27}$   
 (d) none of these
44.  $\lim_{h \rightarrow 0} \frac{\cos^2(x+h) - \cos^2 x}{h}$  is equal to  
 (a)  $\cos^2 x$   
 (b)  $-\sin 2x$   
 (c)  $\sin x \cos x$   
 (d)  $2 \sin x$
45.  $\int \tan^{-1} \left( \sqrt{\frac{1-x}{1+x}} \right) dx$  can be evaluated by the substitution  
 (a)  $x = \tan \theta$   
 (b)  $x = \cos \theta$   
 (c)  $x = \cos 2\theta$   
 (d)  $x = \cot \theta$

### PHYSICS

46. For photoelectric emission, tungsten requires light of  $2300 \text{ \AA}$ . If light of  $1800 \text{ \AA}$  wavelength is incident, then emission
- (a) takes place  
(b) don't take place  
(c) may or may not take place  
(d) depends on frequency.
47. A tyre kept outside in sunlight bursts off after sometime because of
- (a) increase in pressure  
(b) increase in volume  
(c) both (a) and (b)  
(d) none of these.
48. For a wire of length  $l$ , maximum change in length under stress condition is  $2 \text{ mm}$ . What is the change in length under same conditions when length of wire is halved?
- (a)  $1 \text{ mm}$                       (c)  $4 \text{ mm}$   
(b)  $2 \text{ mm}$                       (d)  $8 \text{ mm}$ .
49. Air is blown through a hole on a closed pipe containing liquid. Then the pressure will
- (a) increase on sides  
(b) increase downwards  
(c) increase in all directions  
(d) never increases.
50. Light year is a unit of
- (a) time                      (b) speed  
(c) distance                      (d) none of these.
51. A wire carrying current  $I$  and other carrying  $2I$  in the same direction produces a magnetic field  $B$  at the mid point. What will be the field when  $2I$  wire is switched off?
- (a)  $B/2$                       (b)  $2B$   
(c)  $B$                       (d)  $4B$ .
52. What will be energy stored in a strained wire?
- (a)  $\frac{1}{2} \times \text{load} \times \text{stress}$   
(b)  $\frac{1}{2} \times \text{stress} \times \text{strain}$   
(c)  $\frac{1}{2} \times \text{load} \times \text{strain}$   
(d)  $\frac{1}{3} \times \text{load} \times \text{stress}$
53. If error in measurement of radius of sphere is  $1\%$ , what will be the error in measurement of volume?
- (a)  $1\%$                       (b)  $1/3\%$   
(c)  $3\%$                       (d)  $10\%$ .
54. Minimum number of unequal vectors which can give zero resultant are
- (a) two                      (b) three  
(c) four                      (d) more than four.
55. A coin is dropped in a lift. It takes time  $t_1$  to reach the floor when lift is stationary. It takes time  $t_2$  when lift is moving up with constant acceleration. Then
- (a)  $t_1 > t_2$                       (b)  $t_2 > t_1$   
(c)  $t_1 = t_2$                       (d)  $t_1 \gg t_2$
56. A large ship can float but a steel needle sinks because of
- (a) viscosity                      (b) surface tension  
(c) density                      (d) none of these.
57. In a solenoid, if number of turns is doubled, then self inductance will become
- (a) half                      (b) doubled  
(c)  $1/4$  times                      (d) quadrupled.
58. Core of transformer is made up of
- (a) soft iron                      (b) steel  
(c) iron                      (d) alnico.
59. Transformer is based upon the principle of
- (a) self induction                      (b) mutual induction  
(c) eddy current                      (d) none of these.
60. Refractive index of material is equal to tangent of polarising angle. It is called
- (a) Brewster's law                      (b) Lambert's law  
(c) Malus's law                      (d) Brogg's law.
61. A car accelerates from rest at constant rate for  $1\text{st } 10\text{s}$ . and covers a distance  $x$ . It covers a distance  $y$  in next  $10\text{s}$  at the same acceleration. Which of the following is true?
- (a)  $x = 3y$                       (b)  $y = 3x$   
(c)  $x = y$                       (d)  $y = 2x$ .
62. The horizontal range of a projectile is  $400 \text{ m}$ . The maximum height attained by it will be
- (a)  $100 \text{ m}$                       (b)  $200 \text{ m}$   
(c)  $400 \text{ m}$                       (d)  $800 \text{ m}$ .

63. What determines the nature of the path followed by the particle?  
(a) speed (b) velocity  
(c) acceleration (d) none of these.
64. Which of the following is not an example of perfectly inelastic collision?  
(a) a bullet fired into a block if bullet gets embedded into block  
(b) capture of electrons by an atom  
(c) a man jumping on to a moving boat  
(d) a ball bearing striking another ball bearing.
65. The length of seconds pendulum is 1 m on earth. If mass and diameter of the planet is doubled than that of earth, then length becomes  
(a) 1 m (b) 2 m  
(c) 0.5 m (d) 4 m.
66. A hot and a cold body are kept in vacuum separated from each other. Which of the following cause decrease in temperature of the hot body?  
(a) radiation  
(b) convection  
(c) conduction  
(d) temperature remains unchanged.
67. When a tuning fork produces sound waves in air, which one of the following is same in the material of tuning fork as well as in air?  
(a) wavelength (b) frequency  
(c) velocity (d) amplitude.
68. A bomb explodes on the moon. How long will it take for the sound to reach the earth?  
(a) 10 s (b) 1000 s  
(c) 1 day (d) none of these.
69. What is the angle between the electric dipole moment and the electric field strength due to it on the equatorial line?  
(a)  $0^\circ$  (c)  $180^\circ$   
(b)  $90^\circ$  (d) none of these.
70. The potentials of the two plates of capacities are + 10 V and -10 V. The charge on one of the plates is 40 C. The capacitance of the capacitor is  
(a) 2 F (b) 4 F  
(c) 0.5 F (d) 0.25 F.
71. To draw maximum current from a combination of cells, how should the cells be grouped?  
(a) series  
(b) parallel  
(c) mixed  
(d) depends upon the relative values of external and internal resistance.
72. A wire is cut into 4 pieces, which are put together by sides to obtain one conductor. If the original resistance of wire was R, the resistance of the bundle will be  
(a) R/4 (b) R/8  
(c) R/16 (d) R/32.
73. What happens to the fringe pattern when the Young's double slit experiment is performed in water instead of air?  
(a) shrinks (b) disappear  
(c) unchanged (d) enlarged
74. An object is placed at a distance equal of focal length of convex mirror. If the focal length of the mirror be f, then the distance of the image from the pole of the mirror is  
(a) less than f (b) equal to f  
(c) more than f (d) infinity.
75. Ability of the eye to see objects at all distances is called  
(a) binocular vision (b) myopia  
(c) hypermetropia (d) accommodation.
76. The magnitude of saturation photoelectric current depends upon  
(a) frequency (b) intensity  
(c) work function (d) stopping potential.
77. Which of the following is most unstable?  
(a) electrons (b) protons  
(c) neutrons (d)  $\alpha$ -particle.
78. After 2 hrs.,  $1/16^{\text{th}}$  of initial amount of a certain radioactive isotope remains undecayed. The half-life of the isotope is  
(a) 15 min (c) 45 min  
(b) 30 min (d) 60 min
79. 10 g of ice at  $0^\circ\text{C}$  is mixed with 100 g of water at  $50^\circ\text{C}$ . What is the resultant temperature of mixture?  
(a)  $31.2^\circ\text{C}$  (b)  $32.8^\circ\text{C}$   
(c)  $36.7^\circ\text{C}$  (d)  $38.2^\circ\text{C}$ .

80. An atomiser is based on the application of  
 (a) Torricelli's theorem  
 (b) Bernoulli's theorem  
 (c) Archimedes principle  
 (d) principle of continuity.
81. 'Pascal-second' has the dimensions of  
 (a) force  
 (b) energy  
 (c) pressure  
 (d) coefficient of viscosity.
82. Consider the following equation of Bernoulli's theorem.  

$$P + \frac{1}{2}\rho V^2 + \rho gh = K \text{ (constant).}$$
 The dimensions of K/P are same as that of which of the following?  
 (a) thrust (b) pressure  
 (c) angle (d) viscosity.
83. What effect occurs on the frequency of a pendulum of it is taken from the earth surface to deep into a mine?  
 (a) increases  
 (b) decreases  
 (c) first increases then decreases  
 (d) no effect.
84. The volume of a cube in  $m^3$  is equal to the surface area of the cube in  $m^2$ . The volume of the cube is  
 (a)  $64 m^3$  (b)  $216 m^3$   
 (c)  $512 m^3$  (d)  $196 m^3$ .
85. An ice block contains a glass ball when the ice melts within the water containing vessel, the level of water  
 (a) rises  
 (b) falls  
 (c) unchanged  
 (d) first rises and then falls.

### CHEMISTRY

86. If 0.1 M of a weak acid is taken, and its percentage of degree of ionization is 1.34%, then calculate its ionization constant.  
 (a)  $0.8 \times 10^{-5}$  (b)  $1.79 \times 10^{-5}$   
 (c)  $0.182 \times 10^{-5}$  (d) none of these.
87. If a substance with half life 3 days is taken at other place in 12 days. What amount of substance is left now?  
 (a) 1/4 (b) 1/8  
 (c) 1/16 (d) 1/32.
88. To prepare a solution of concentration of 0.03 g/ml of  $AgNO_3$ , what amount of  $AgNO_3$  should be added in 60 ml of solution?  
 (a) 1.8 (b) 0.8  
 (c) 0.18 (d) none of these.
89. How will you separate a solution (miscible) of benzene +  $CHCl_3$ ?  
 (a) sublimation (b) filtration  
 (c) distillation (d) crystallisation.
90. When alcohol reacts with concentrated  $H_2SO_4$  intermediate compound formed is  
 (a) carbonium ion  
 (b) alkoxy ion  
 (c) alkyl hydrogen sulphate  
 (d) none of these.
91. According to law of mass action, rate of a chemical reaction is proportional to  
 (a) concentration of reactants  
 (b) molar concentration of reactants  
 (c) concentration of products  
 (d) molar concentration of products.
92. In Hall's process, the main reagent is mixed with  
 (a) NaF (b)  $Na_3AlF_6$   
 (c)  $AlF_3$  (d) none of these.
93. In electrolysis of dilute  $H_2SO_4$ , what is liberated at anode?  
 (a)  $H_2$  (b)  $SO_4^{2-}$   
 (c)  $SO_2$  (d)  $O_2$
94. Vinegar obtained from sugarcane has  
 (a)  $CH_3COOH$  (b)  $HCOOH$   
 (c)  $C_6H_5COOH$  (d)  $CH_3CH_2COOH$ .
95. What is the packet of energy called?  
 (a) electron (b) photon  
 (c) positron (d) proton.
96. When an acid cell is charged, then  
 (a) voltage of cell increases  
 (b) electrolyte of cell dilutes  
 (c) resistance of cell increases  
 (d) none of these.

97. NaOH is prepared by the method  
(a) Down's cell  
(b) Castner cell  
(c) Solvay process  
(d) Castner Kellner cell.
98. When toluene is treated with  $\text{KMnO}_4$ , what is produced?  
(a) benzene (b) chlorobenzene  
(c) benzaldehyde (d) benzoic acid.
99. Solder is an alloy of  
(a) 70% lead, 30% tin  
(b) 30% lead, 70% tin  
(c) 80% lead, 20% tin  
(d) 90% Cu, 10% tin.
100. Carbolic acid is  
(a)  $\text{C}_6\text{H}_5\text{CHO}$  (b)  $\text{C}_6\text{H}_6$   
(c)  $\text{C}_6\text{H}_5\text{COOH}$  (d)  $\text{C}_6\text{H}_5\text{OH}$ .
101. Alcohols are isomeric with  
(a) acids (b) ethers  
(c) esters (d) aldehydes.
102. The group linkage present in fats is  
(a) peptide linkage (b) ester linkage  
(c) glycosidic linkage (d) none of these.
103. The group present in waxes are  
(a) acid group (b) ester group  
(c) alcohol group (d) ether group.
104. Which of the following is liquid at room temperature?  
(a)  $\text{CH}_3\text{I}$  (b)  $\text{CH}_3\text{Br}$   
(c)  $\text{C}_2\text{H}_5\text{Cl}$  (d)  $\text{CH}_3\text{F}$ .
105. Which gas is liberated when  $\text{Al}_4\text{C}_3$  is hydrolysed?  
(a)  $\text{CH}_4$  (b)  $\text{C}_2\text{H}_2$   
(c)  $\text{C}_2\text{H}_6$  (d)  $\text{CO}_2$
106. The only alcohol that can be prepared by the indirect hydration of alkene is  
(a) ethyl alcohol (b) propyl alcohol  
(c) isobutyl alcohol (d) methyl alcohol
107. Baking powder is  
(a)  $\text{NaHCO}_3$   
(b)  $\text{NaHCO}_3 \cdot 6\text{H}_2\text{O}$   
(c)  $\text{Na}_2\text{CO}_3$   
(d)  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ .
108. When washing soda is heated  
(a) CO is released  
(b)  $\text{CO} + \text{CO}_2$  is released  
(c)  $\text{CO}_2$  is released  
(d) water vapour is released.
109. Which of the following attacks glass?  
(a) HCl (b) HF  
(c) HI (d) HBr.
110. A colourless gas with the smell of rotten fish is  
(a)  $\text{H}_2\text{S}$  (b)  $\text{PH}_3$   
(c)  $\text{SO}_2$  (d) none of these.
111. Salicylic acid is prepared from phenol by  
(a) Reimer Tiemann reaction  
(b) Kolbe's reaction  
(c) Kolbe-electrolysis reaction  
(d) none of these.
112. Heating of ore in presence of air to remove sulphur impurities is called  
(a) calcination (b) roasting  
(c) smelting (d) none of these.
113.  $\text{CaCO}_3 \rightleftharpoons \text{CaO} + \text{CO}_2$  reaction in a line goes to completion because  
(a) CaO does not react to  $\text{CO}_2$  to give  $\text{CaCO}_3$   
(b) backward reaction is very slow  
(c)  $\text{CO}_2$  formed escapes out  
(d) none of these.
114. If 30 ml of  $\text{H}_2$  and 20 ml of  $\text{O}_2$  reacts to form water, what is left at the end of the reaction?  
(a) 10 ml of  $\text{H}_2$  (b) 5 ml of  $\text{H}_2$   
(c) 10 ml of  $\text{O}_2$  (d) 5 ml of  $\text{O}_2$ .
115. Which of the following is a highly corrosive salt?  
(a)  $\text{FeCl}_2$  (b)  $\text{PbCl}_2$   
(c)  $\text{Hg}_2\text{Cl}_2$  (d)  $\text{HgCl}_2$ .
116. 0.5 M of  $\text{H}_2\text{SO}_4$  is diluted from 1 litre to 10 litre, normality of resulting solution is  
(a) 1 N (b) 0.1 N  
(c) 10 N (d) 11 N.
117. Formula for tear gas is  
(a)  $\text{COCl}_2$   
(b)  $\text{CCl}_3\text{NO}_2$   
(c)  $\text{N}_2\text{O}$   
(d) none of these.

118. Which of the following is potassiumferricyanide?  
 (a)  $K_4[Fe(CN)_6]$  (b)  $K_3[Fe(CN)_6]$   
 (c)  $K_3[Fe(CN)_3]$  (d)  $K_3[Fe(CN)_4]$ .
119. Sodium nitroprusside when added to an alkaline solution of sulphide ions produce a  
 (a) red colouration (b) blue colouration  
 (c) purple colouration (d) brown colouration.
120. The product obtained on reaction of  $C_2H_5Cl$  with hydrogen over palladium carbon is  
 (a)  $C_3H_8$  (b)  $C_4H_{10}$   
 (c)  $C_2H_6$  (d)  $C_2H_4$ .
121. A solution has pH = 5, it is diluted 100 times, then it will become  
 (a) neutral (b) basic  
 (c) unaffected (d) more- acidic.
122. Ketones react with Mg-Hg over water gives  
 (a) pinacolone (b) pinacols  
 (c) alcohols (d) none of these.
123. X is heated with soda lime and gives ethane. X is  
 (a) ethanoic acid  
 (b) methanoic acid  
 (c) propanoic acid  
 (d) either (a) or (c).
124. The product obtained on fusion of  $BaSO_4$  and  $Na_2CO_3$  is  
 (a)  $BaCO_3$  (b) BaO  
 (c)  $Ba_3OH_2$  (d)  $BaHSO_4$ .
125. A 5 molar solution of  $H_2SO_4$  is diluted from 1 litre to 10 litres. What is the normality of the solution?  
 (a) 0.25 N (b) 1 N  
 (c) 2 N (d) 7 N.

### INTELLIGENCE, LOGIC & REASONING

126. The L.C.M. and H.C.F. of two positive numbers is 400 and 40 respectively. If one of the number is 200, what is the other number ?  
 (a) 80 (b) 50  
 (c) 60 (d) 40
127. How much must be subtracted from 34968725 to make it exactly divisible by 12 ?  
 (a) 0  
 (b) 7  
 (c) 5  
 (d) Cannot be determined
128. A person earns ₹ 400 on a capital of ₹ 1000 as simple interest in 4 year. If the same rate of interest is applicable compoundly (p.a.), what would be the compound interest for 2 years ?  
 (a) ₹ 200 (b) ₹ 110  
 (c) ₹ 310 (d) ₹ 210
129. A student first decreased a number by 20% and then increased the decreased number by 20%. The number so obtained is 20 less the original so what was the original number ?  
 (a) 100 (b) 500  
 (c) 400 (d) 200
130. ₹ 720 are to be distributed among A, B and C such that half of A's share is equal to  $\frac{1}{3}$  of B's share which is equal to  $\frac{1}{4}$  of C's share. How much is the share of C ?  
 (a) ₹ 160 (b) ₹ 240  
 (c) ₹ 600 (d) ₹ 320
131. In an examination 1800 candidates were boys and 2200 were girls. If 42% of boys and 48% of girls passed the examination, what is the ratio of failed boys to failed girls ?  
 (a) 125 : 111 (b) 42 : 48  
 (c) 39 : 47 (d) 261 : 286
132. A dishonest dealer pretends to sell at the cost price but earns a profit of 25% by underweighing. What weight must he be using for 1 kg ?  
 (a) 750 gm (b) 800 gm  
 (c) 500 gm (d) 875 gm
133. A person works twice as fast as a woman. A woman works twice as fast as a child. If 16 persons can complete a job in 12 days, how many days would be required for 32 women, and 64 boys together to complete the same job?  
 (a) 2 days (c) 3 days  
 (b) 4 days (d) 6 days



134. The migration rate of people from city A to city B is 20% p.a. If the population of city A and B is 12,00,000 and 6,00,000 respectively in the beginning of any years, during which of the following years would the population of both cities be equal?
- (a) 2nd year  
(c) 1st year  
(b) 3rd year  
(d) Cannot be determined
135. Rajeev and Abhishek started from A towards B at the speeds of 40 kmph at 7.00 a.m and 10.00 a.m respectively. At what time would they meet provided they are travelling at uniform speed ?
- (a) 12.00 noon  
(b) 2.00 pm  
(c) 11.00 am  
(d) 1.00 pm

### ENGLISH LANGUAGE & COMPREHENSION

**Directions (Q. 136 – 144):** Read the following passage carefully and answer the questions given below it. Certain words/phrases are printed in bold to help you locate them while answering some of the questions.

Monopolies are bad in national politics and worse in international politics. The unipolar world led by the US is an example of political monopoly. In the language of history and politics, monopolies are discussed in terms of balance of power. What we have today is an imbalance of power. The US-led war against Iraq needs to be seen in the context of this imbalance. There has been much talk about the need for a multipolar world as an ideal solution to the existing anarchy in the international arena. The US and UK combine have been considered to be the perpetrators of the war. They disregarded global public opinion and have gone outside the mandate of the United Nations. This is an indication of US considering itself the only superpower. Its consideration may be justified because it has all the **pervading** might and also the necessary will. Its might is in two domains : one, military and the other economic. On every issue of any importance that **confronts** foreign policy-making of any country, US interests becomes vital. This **omnipresence** of the US makes it different from any other country. Some political observers argue that this is temporary; that the Russians will be back; that the Germans, Japanese, Europeans are coming; that China is not far away. In short, we occupy a period of **metamorphosis** from a bipolar to a multipolar world, a period that may constitute a unipolar moment but that phase may be over shortly. When will this unipolar moment be over? None has the answer to this question. Most observe

view US as somewhere between primacy and dominance, depending on the issue. The main question is how to deal with hegemony, primacy or dominance. In dealing with a big power, a smaller power must choose either balancing or bandwagoning or hiding. In a unipolar world, the general trend of foreign policy will be to **bandwagon**. Middle powers will need to bandwagon less than small powers and on particular issues may be able to balance or hide.

136. For initiating the war, the author of the passage
- (a) appreciates the joint action of the US and the UK  
(b) considers the war as unjustified and blames the US and the UK  
(c) thinks that the United Nations should have admired the US and the UK  
(d) blames the global public opinion
137. According to the author, in dealing with superpowers, what course do small powers generally adopt ?
- (a) They counter effectively  
(b) they try to balance  
(c) They tactfully avoid confrontation  
(d) They do not succumb to any pressure.
138. The author has laid reasonable emphasis on which of the following ?
- (A) US-UK combine war against Iraqis  
(B) The global power balancing amongst various nations  
(C) The agonies of war suffered by the common public
- (a) Only A                      (b) Only B  
(c) Only C                      (d) A and B only

139. Which of the following statements is TRUE in the context of the passage ?

- (a) The world is heading towards unipolarity
- (b) The 'multipolarity to unipolarity' transition is certain.
- (c) The unipolarity phase is likely to be short-lived.
- (d) Primacy and dominance are seldom exhibited by the US.

140. The author rates which of the following countries as the most powerful substitute for the US ?

- (a) Germany
- (b) Japan only
- (c) Russia only
- (d) None of these

**Directions (Q.141 – 142) :** Which of the following is most opposite in meaning of the word given in bold as used in the passage.

141. Bandwagon

- (a) unconditionally supporting
- (b) opposing
- (c) lobbying
- (d) influencing significantly

142. Pervading

- (a) spreading all over
- (b) accommodating the maximum
- (c) with a limited reach
- (d) without influence

**Directions (Q. 143 – 144) :** Choose the word which is most nearly the same in meaning as the word in bold as used in the passage.

143. Confronts

- (a) involves
- (b) opposes
- (c) counters
- (d) safeguards

144. Metamorphosis

- (a) multiples
- (b) agony
- (c) disaster
- (d) transition

**Directions (Q. 145 – 147) :** Which of the phrases (a), (b), (c) and (d) given below each sentence should replace the phrase printed in bold to make the sentence grammatically correct ?

145. We have received no worthy backing of the Americans in the resolution of our problems, especially Kashmir.

- (a) worthy backing for
- (b) worthwhile backing from
- (c) worth backing of
- (d) backing worthily of

146. The government's decision of checking weight and price of retail products is laudable.

- (a) for checking of weight
- (b) for checking of the weight
- (c) to the checking of weight
- (d) to check the weight

147. Such drives will have no help unless the loopholes in the laws are plugged and strict enforcement is ensured.

- (a) will not be of help
- (b) will be no help
- (c) will not have help
- (d) will be not for help

**Directions (Q. 148 – 150) :** In each of the questions below four sentences are given which are denoted by (A), (B), (C) and (D). By using all the four sentences you have to frame a meaningful para. The correct order of the sentences is your answer. Choose from the four alternatives the one having the correct order of sentences and mark it as your answer.

148. A. The future is unpredictable, so the end is unknown to us.

B. Ancient wisdom had no hesitation in accepting this truth.

C. This is the mystery of human life.

D. But today, we find it difficult to accept.

(a) BDCA

(b) ACBD

(c) CABD

(d) DBCA

149. A. Exiled Bangladeshi writer Tashlima Nasreen happens to be a writer who elicits the strongest of responses from ultrasensitive people.
- B. There are some writers who seem to have the habit of writing only about things that work people up to a tizzy.
- C. Such is the thinness of their skins that anything off the beaten path or over the edge makes them break out in moral rashes.
- D. But there are also some people who actually have the habit of getting worked up to a tizzy.
- (a) ABCD                      (b) DCBA  
(c) CDAB                      (d) BDCA
150. A. One also doesn't have to emphasize the negative impact of the communal holocaust in Gujarat both domestically and externally.
- B. Perceptions in the international community are that our foreign and security policies lack perspective and a focussed attention on India's interests.
- C. All these are concerns which should influence the decisions of voters in the forthcoming elections.
- D. It is also thought that India is a pliable and soft state incapable of decisiveness in responding to direct threats to its security.
- (a) CABD                      (b) DACB  
(c) CDBA                      (d) BDAC

## ANSWERS

### MATHEMATICS

1. (b) 2. (a) 3. (d) 4. (b) 5. (b) 6. (b) 7. (b) 8. (d) 9. (a) 10. (c)  
11. (b) 12. (b) 13. (a) 14. (a) 15. (a) 16. (b) 17. (d) 18. (d) 19. (c) 20. (c)  
21. (c) 22. (a) 23. (c) 24. (a) 25. (d) 26. (c) 27. (a) 28. (c) 29. (d) 30. (d)  
31. (b) 32. (d) 33. (d) 34. (d) 35. (c) 36. (c) 37. (c) 38. (c) 39. (d) 40. (b)  
41. (a) 42. (d) 43. (d) 44. (b) 45. (b)

### PHYSICS

46. (a) 47. (a) 48. (a) 49. (c) 50. (c) 51. (c) 52. (b) 53. (c) 54. (b) 55. (a)  
56. (d) 57. (d) 58. (a) 59. (b) 60. (a) 61. (b) 62. (a) 63. (d) 64. (d) 65. (c)  
66. (a) 67. (b) 68. (d) 69. (c) 70. (a) 71. (d) 72. (d) 73. (a) 74. (a) 75. (d)  
76. (b) 77. (c) 78. (b) 79. (d) 80. (b) 81. (d) 82. (c) 83. (b) 84. (b) 85. (c)

### CHEMISTRY

86. (b) 87. (c) 88. (a) 89. (c) 90. (a) 91. (b) 92. (b) 93. (d) 94. (a) 95. (b)  
96. (a) 97. (d) 98. (d) 99. (b) 100. (d) 101. (b) 102. (b) 103. (b) 104. (a) 105. (a)  
106. (a) 107. (a) 108. (d) 109. (b) 110. (b) 111. (a) 112. (b) 113. (c) 114. (d) 115. (d)  
116. (b) 117. (b) 118. (b) 119. (c) 120. (c) 121. (a) 122. (b) 123. (c) 124. (a) 125. (a)

### INTELLIGENCE, LOGIC & REASONING

126. (a) 127. (c) 128. (d) 129. (b) 130. (d) 131. (d) 132. (b) 133. (d) 134. (a) 135. (d)

### ENGLISH LANGUAGE & COMPREHENSION

136. (b) 137. (b) 138. (b) 139. (c) 140. (d) 141. (b) 142. (c) 143. (a) 144. (d) 145. (b)  
146. (d) 147. (a) 148. (b) 149. (d) 150. (d)