PRACTICE PAPER – III

MATHEMATICS

1. $z + \bar{z} = 0$, if and only if
   - (a) Re $(z) = 0$
   - (b) Im $(z) = 0$
   - (c) $z = 0$
   - (d) none of these

2. $z\bar{z} = 0$, if and only if
   - (a) Re$(z) = 0$
   - (b) Im $(z) = 0$
   - (c) $z = 0$
   - (d) none of these

3. $(3 + w + 3w^2)^4$ equals
   - (a) 16
   - (b) 16 w
   - (c) 16 w^2
   - (d) none of these

4. The smallest integer for which $\left(\dfrac{1+i}{1-i}\right)^n = 1$ is
   - (a) $n = 8$
   - (b) $n = 12$
   - (c) $n = 16$
   - (d) $n = 4$

5. 99th term of the series $2 + 7 + 14 + 23 + 34 + \ldots$ is
   - (a) 9998
   - (b) 9999
   - (c) 10000
   - (d) none of these

6. If a, b, c are in A.P. as well as in G.P., then
   - (a) $a = b \neq c$
   - (b) $a \neq b = c$
   - (c) $a \neq b \neq c$
   - (d) $a = b = c$

7. The sum of 40 terms of an A.P. whose first term is 2 and common difference 4, will be
   - (a) 3200
   - (b) 1600
   - (c) 200
   - (d) 2800

8. The value of $9^{1/3} \times 9^{1/9} \times 9^{1/27}, \ldots \infty$, is
   - (a) 9
   - (b) 1
   - (c) 3
   - (d) none of these

9. If the sum of first n natural numbers is one–fifth of the sum of their squares, then n is
   - (a) 5
   - (b) 6
   - (c) 7
   - (d) 8

10. If one root of $5x^2 + 13x + x = 0$ is reciprocal of the other, then
    - (a) $x = 0$
    - (b) $x = 5$
    - (c) $x = \dfrac{1}{6}$
    - (d) $x = 6$

11. If $x^2 + px + 1$ is a factor of $ax^3 + bx + c$, then
    - (a) $a^2 + c^2 = -ab$
    - (b) $a^2 - c^2 = -ab$
    - (c) $a^2 - c^2 = ab$
    - (d) $a^2 + c^2 = ab$

12. If $x = 2 + 2^{2/3} + 2^{1/3}$, then the value of $x^3 - 6x^2 + 6x$ is
    - (a) 3
    - (b) 2
    - (c) 1
    - (d) 4

13. $16 \log_4 5$ equals
    - (a) 5
    - (b) 16
    - (c) 25
    - (d) 36

14. The value of $\sqrt{\log_{0.5}^2 4}$ is
    - (a) -2
    - (b) $\sqrt{-4}$
    - (c) 2
    - (d) none of these

15. If $a^x = b$, $b^y = c$, $c^z = a$, then value of xyz is
    - (a) 6
    - (b) 1
    - (b) 2
    - (d) 3

16. If $A = \log_2 \log_2 \log_4 256 + 2\log_{\sqrt{2}}^2$, then $A =$
    - (a) 2
    - (b) 3
    - (c) 5
    - (d) 7

17. The value of $(0.2)^{\log_{\sqrt{5}}\left(\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\ldots\infty\right)}$ is
    - (a) 4
    - (b) 8
    - (c) 2
    - (d) 6

18. The solution set of equation $|x - 3| = x - 3$ is
    - (a) $]\,3, \infty\,[$
    - (b) $[3, \infty]$
    - (c) ϕ
    - (d) all real number

19. The value of x which satisfy $yz = a^2$, $zx = b^2$, $xy = c^2$ are
    - (a) $\pm \dfrac{ca}{b}$
    - (b) $\pm \dfrac{a}{bc}$
    - (c) $\pm \dfrac{bc}{a}$
    - (d) $\pm \dfrac{b}{ca}$

20. $\displaystyle\sum_{r=0}^{m}{}^{n+r}C_n$ is equal to
    - (a) ${}^{n+m+1}C_{n+1}$
    - (b) ${}^{n+m+2}C_n$
    - (c) ${}^{n+m+3}C_{n-1}$
    - (d) none of these

21. If a polygon has 44 diagonals, then the number of its sides are
    - (a) 11
    - (b) 7
    - (c) 8
    - (d) 9

22. If 7 points out of 12 are in same striaght line, then the number of triangles formed is
    (a) 19   (b) 185
    (c) 201   (d) 508

23. Out of 10 red and 8 white balls, 5 red and 4 white balls can be drawn in how many number of ways ?
    (a) $^8C_5 \times {}^{10}C_4$ (b) $^{10}C_5 \times {}^8C_4$
    (c) $^{18}C_9$ (d) none of these

24. 7 men and 7 women are to sit round a table so that there is a man on either side of a woman. The number of seating arrangement is
    (a) $(7!)^2$ (b) $(6!)^2$
    (c) 6! 7!   (d) 7!

25. Sum of co-efficients in the expansion of $(x + 2y + 2)^{10}$ is
    (a) 2^{10} (b) 3^{10}
    (c) 1   (d) none of these

26. The number of terms in the expansion of $(x + y + 2)^{10}$ is
    (a) 11   (b) 33
    (c) 66   (d) none of these

27. The total number of terms in the expansion of $(x + a)^{100} + (x - a)^{100}$ after simplification is
    (a) 202   (b) 51
    (c) 50   (d) none of these

28. The co-efficient of middle term in expansion of $(1+x)^{10}$ is
    (a) $\dfrac{10!}{5!\,6!}$ (b) $\dfrac{10!}{5!^2}$
    (c) $\dfrac{10!}{5!\,7!}$ (d) none of these

29. The coefficient of y in the expansion of $\left(y^2 + \dfrac{c}{y}\right)^5$ is
    (a) 20c   (b) 10c
    (c) $10c^3$ (d) $20c^2$

30. The term independent of x in $\left(x^2 - \dfrac{1}{x}\right)^9$ is
    (a) 1   (b) –1
    (c) 48   (d) none of these

31. If each element of a determinant of 3rd order with value A is multiplied by 3, then the new determinant is
    (a) 3A   (b) 9A
    (c) 27A   (d) none of these

32. The value of $\begin{vmatrix} x+1 & x+2 & x+4 \\ x+3 & x+5 & x+8 \\ x+7 & x+10 & x+14 \end{vmatrix}$ is
    (a) –2   (b) $x^2 + 2$
    (c) 2   (d) none of these

33. If a, b, c are different and $\begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix} = 0$, then x is equal to
    (a) a   (b) b
    (c) c   (d) 0

34. If $A + B + C = \pi$, then $\begin{vmatrix} \sin(A+B+C) & \sin B & \cos C \\ -\sin B & 0 & \tan A \\ \cos(A+B) & \tan A & 0 \end{vmatrix} =$
    (a) cos A   (b) cos A sin B
    (c) 0   (d) sin C

35. If x > 0 and a is known positve number then the least value of $ax + \dfrac{a}{x}$ is
    (a) a^2 (b) a
    (c) 2a   (d) none of these

36. The largest interval for which $x^{12} - x^9 + x^4 - x + 1 > 0$, is
    (a) $-4 < x \le 0$ (b) $0 < x < 1$
    (c) $-100 < x < 100$ (d) $-\infty < x < \infty$

37. The probability of getting heads in both trials when a balanced coin is tossed twice, will be
    (a) $\dfrac{1}{4}$ (b) $\dfrac{1}{2}$
    (c) 1   (d) $\dfrac{3}{4}$

38. Two cards are drawn at random from a pack to 52 cards. The probability of these two being aces is
    (a) $\dfrac{1}{26}$ (b) $\dfrac{1}{221}$
    (c) $\dfrac{1}{2}$ (d) none of these

39. A and B throw 2 dices. If A throws 9, then B's chance of throwing higher number is

(a) $\dfrac{1}{6}$

(b) $\dfrac{1}{2}$

(c) $\dfrac{1}{3}$

(d) $\dfrac{1}{8}$

40. If A and B are independent events, then $P(A \cap B)$ equals

(a) $P(A) + P(B)$ (b) $P(A)\ P(B)$

(c) $P(A/B)$ (d) $P(B/A)$

41. If A and B are mutually exclusive events, then $P(A \cap B)$ equals

(a) 0   (b) $\dfrac{1}{2}$

(c) 1   (d) $\dfrac{1}{4}$

42. Two dice are thrown simultaneously, then probability of obtaining a score of 5 is

(a) $\dfrac{1}{18}$ (b) $\dfrac{1}{12}$

(c) $\dfrac{1}{9}$ (d) none of these

43. The triangle joining A(2,7), B (4, −1) and C(−2, 6) is

(a) equilateral   (b) right angled

(c) isoceles   (d) acute angled

44. The area of triangle with vertices (−4,1), (1,2), (4,−3) is

(a) 14   (b) 16

(c) 15   (d) 18

45. The equation of line through (1, 2) and perpendicular to $x + y + 1 = 0$ is

(a) $y - x + 1 = 0$

(b) $y - x - 1 = 0$

(c) $y - x + 2 = 0$

(d) $y - x - 2 = 0$

PHYSICS

46. Two lenses whose powers are +2D and −4D respectively. The power of combination will be

(a) −4 D   (b) +2 D

(c) −2 D   (d) +4 D

47. In a transformer, the number of turns of primary coil and secondary coil are 5 and 4 respectively. If 240 V is applied on the primary coil, then the ratio of current in primary and secondary coil is

(a) 5 : 9   (b) 5 : 4

(c) 4 : 5   (d) 9 : 5

48. Two vessels of different materials are similar in size in every respect. The same quantity of ice filled in them gets melted in 20 minutes and 40 minutes respectively. The ratio of thermal conductivities of the metal is

(a) 3 : 1   (b) 6 : 5

(c) 5 : 6   (d) 2 : 1

49. The part of a transistor, which is heavily doped to produce a large number of majority carriers, is

(a) collector   (b) emitter

(c) base   (d) none of these

50. We have a galvanometer of resistance 25 Ω wire. It is shunted by a 2.5 wire. The part of total current that flows through the galvanometer is given as

(a) $\dfrac{I_g}{I} = \dfrac{33}{11}$ (b) $\dfrac{I_g}{I} = \dfrac{33}{11}$

(c) $\dfrac{I_g}{I} = \dfrac{1}{11}$ (d) $\dfrac{I_g}{I} = \dfrac{4}{11}$

51. The kinetic energy of a particle executing S.H.M., is 16 when it is in its mean position. If the amplitude of oscillations is 29 cm, and the mass of the particle is 5.12 kg, then time period of the oscillation is

(a) 20π sec

(b) 2π sec

(c) $\pi/5$ sec

(d) 5π sec

52. A body of mass 100 gm is rotating in a circular path of radius r with constant velocity. The work done in one complete revolution is

(a) $\dfrac{100}{r}$ J   (b) $\dfrac{r}{100}$ J

(c) 100 r J   (d) Zero

53. If the surface tension of water is 0.06 N m^{-1}, then the capillary rise in a tube of a diameter 1 mm is ($\theta = 0°$)

(a) 3.12 cm   (b) 2.44 cm

(c) 1.68 cm   (d) 3.86 cm

54. Swimming is possible by the

(a) Third law of motion

(b) Second law of motion

(c) First law of motion

(d) Newton's law of gravitation

55. In an A.C. circuit the potential difference across an inductance and resistance joined in series are respectively 16 V and 20 V. The total potential difference across the circuit is

(a) 31.9 V   (b) 25.6 V

(c) 20.0 V   (d) 53.5 V

56. Force of attraction between the plates of a parallel plate capacitor is

(a) $\dfrac{q^3}{2\varepsilon_0 A}$ (b) $\dfrac{q}{\varepsilon_0 AK}$

(c) $\dfrac{q^2}{2\varepsilon_0 AK}$ (d) $\dfrac{q^2}{2\varepsilon_0 A^2 K}$

57. The velocity of sound is greatest in

(a) vacuum   (b) air

(c) water   (d) metal

58. A force of 50 dynes is acted on a body of mass 5 gm which is at rest for an interval of 3 sec, then impulse is

(a) 1.5×10^{-3} N-s

(b) 0.98×10^{-3} N-s

(c) 0.16×10^{-3} N-s

(d) 2.5×10^{-3} N-s

59. Which of the following does not change when light goes from one medium to another?

(a) Speed   (b) Wavelength

(c) Frequency   (d) Intensity

60. The Doppler's effect is applicable for

(a) Space waves   (b) Sound waves

(c) Light waves   (d) Both (b) and (c)

61. S.I unit of magnetic flux is

(a) weber per m   (b) weber

(c) weber-m^{-3} (d) weber per m^4

62. If the displacement of a particle executing S.H.M. is given by y = 0.30 sin (220t + 0.64) in metre, then the frequency and maximum velocity of the particle is

(a) 58 Hz, 113 m/s   (b) 45 Hz, 93 m/s

(c) 35 Hz, 66 m/s   (d) 36 Hz, 133 m/s

63. The kinetic energy of a body of mass 2 kg and momentum of 2 N-s is

(a) 3 J   (b) 2 J

(c) 1 J   (d) 4 J

64. A ray of light is incident on the surface of separation of a medium with the velocity of light at an angle 45° and is refracted in the medium at an angle 30°. What will be the velocity of light in the medium?

(a) 3.18×10^8 m/s   (b) 2.12×10^8 m/s

(c) 1.96×10^8 m/s   (d) 3.33×10^8 m/s

65. If a body of mass 3 kg is dropped from the top of a tower of height 25 metres, then its kinetic energy after 3 seconds will be

(a) 746 J   (b) 1048 J

(c) 1296 J   (d) 557 J

66. If two balls, each of mass 0.06 kg, moving in opposite directions with speed of 4 m/s, collide and rebound with the same speed, then the impulse imparted to each ball due to other is

(a) 0.81 kg m/s   (b) 0.53 kg m/s

(c) 0.48 kg m/s   (d) 0.92 kg m/s

67. When the amount of work done is 333 cal and change in internal energy is 167 cal, then the heat supplied is

(a) 500 cal   (b) 300 cal

(c) 100 cal   (d) 700 cal

68. If an iron ball and a wooden ball of the same radius are released from a height 'h' in vacuum. then time taken by both of them to reach ground will be

(a) Roughly equal   (b) Exactly equal

(c) Unequal   (d) Zero

69. The E.M.F. of the Daniel cell is

(a) 2.56 V

(b) 1.12 V

(c) 0.56 V

(d) 3.12 V

70. The speed of a wave in a medium is 760 m/s. If 3600 waves are passing through a point in the medium in 2 minutes, then its wavelength is

(a) 41.5 m   (b) 25.3 m

(c) 13.8 m   (d) 57.2 m

71. If luminous-efficiency of a lamp is 2 lumen 1 watt and its luminous-intensity is 42 candela then, power of the lamp is

(a) 138 W   (b) 76 W

(c) 62 W   (d) 264 W

72. The specific heat of a gas in an isothermal process is

(a) Negative   (b) Zero

(c) Infinite   (d) Remains constant

73. A big drop is formed by 1000 small droplets of water, then the radius of small drop is

(a) $\dfrac{R}{6}$ (b) $\dfrac{R}{5}$

(c) $\dfrac{R}{2}$ (d) $\dfrac{R}{10}$

74. The kinetic energy of one g-molecule of a gas at normal temperature and pressure is (R = 8.31 J/mole–K)

(a) 2.7×10^2 J   (b) 1.3×10^2 J

(c) 0.56×10^4 J   (d) 3.74×10^3 J

75. The temperature-coefficient of resistance of conductors is

(a) Neutral   (b) Negative

(c) Positive   (d) First (c) then (a)

76. A black body radiates heat energy at the rate of 2×10^5 Joule/sec/m^2 at a temperature of 127°C. The temperature of the black body, at which the rate of heat radiation is 32×10^5 J/sec/m^2 is

(a) 873°C   (b) 527°C

(c) 273°C   (d) 927°C

77. Which of the following series is found in the visible region?

(a) Pfund

(b) Paschen

(c) Lyman

(d) Balmer

78. When an electron is emitted from a nucleus, then effect on its neutron-proton" - ratio is

(a) Remains same   (b) Decreased

(c) Increased   (d) First (a) then (b)

79. The half-life of a radioactive is 3.6 days. How much of 20 miligram of that radioactive will remain after 40 days?

(a) 6.20×10^{-3} mg   (b) 4.31×10^{-2} mg

(c) 2.68×10^9 mg   (d) 9.76×10^{-3} mg

80. When a slow neutron goes sufficiently close to a U^{235} nucleus then the process takes place is

(a) Fusion of U^{235} (b) Fusion of neutron

(c) Fission of U^{235} (d) First (a), then (b)

81. The first operation involved in a carnot cycle is

(a) Isothermal compression

(b) Adiabatic expansion

(c) Isothermal expansion

(d) Adiabatic compression

82. A parallel plate capacitor is charged to 60 µC. Due to a radioactive source, the plate loses charge at the rate of $1 \cdot 8 \times 10^{11}$ C/s. The magnitude of displacement current is

(a) 4.1×10^{11} C/s   (b) 3.6×10^{11} C/s

(c) 1.8×10^{8} C/s   (d) 5.7×10^{12} C/s

83. A body is executing simple harmonic motion with an angular frequency 2 rad/sec. The velocity of the body at 20 mm displacement. when the amplitude of motion is 60 mm. is

(a) 118 mm/s   (b) 113 mm/s

(c) 90 mm/s   (d) 131 mm/s

84. A tuning fork makes 250 vibrations per second in air. When the velocity of sound is 330 m/s, then wave length of the tone emitted is

(a) 1.11 m   (b) 0.98 m

(c) 0.56 m   (d) 1.29 m

85. The mass of moon is 7.34×10^{22} kg. If the acceleration due to gravity on the moon is 1.4 m/s^2, the radius of the moon is

(G = 6.667×10^{11} N–m^2/kg^2)

(a) 1.92×10^6 m

(b) 1.86×10^6 m

(c) 0.56×10^4 m

(d) 1.01×10^{11} m

CHEMISTRY

86. When enthalpy and entropy change for a chemical reaction are -2.5×10^3 cals and 7.4 cals deg^{-1} respectively predict the reaction at 298 K is

   (a) irreversible　　　　(b) reversible

   (c) spontaneous　　　(d) non-spontaneous

87. Benzaldehyde reacts with ammonia to form

   (a) hydro benzamide　(b) benzamide

   (c) aniline　　　　　(d) phenyl cyanide

88. Which of the following has zero dipole moment?

   (a) NH_4　　　　　　(b) CH_4

   (c) PH_3　　　　　　(d) CH_2Cl_2

89. The pH value of 10^{-8} M HCl is

   (a) more than 7　　　(b) less than 7

   (c) equal to 7　　　　(d) either (a) or (c)

90. The number of electrons shared by each outermost shell of N_2 is

   (a) 4　　　　　　　　(b) 3

   (c) 2　　　　　　　　(d) 5

91. For making Ag from $AgNO_3$, which of the following is the correct statement?

   (a) with Na_2CO_3　　(b) with AsH_3

   (c) with PH_3　　　　(d) with NH_3

92. Night blindness is caused by the deficiency of

   (a) vitamin-C　　　　(b) vitamin-A

   (c) vitamin-B_{12}　　(d) vitamin-E

93. If the volume of 2 moles of an ideal gas at 540 K is 44.8 litre, then its pressure will be

   (a) 3 atmosphere　　(b) 2 atmosphere

   (c) 1 atmosphere　　(d) 4 atmosphere

94. Anhydrous $AlCl_3$ is prepared from

   (a) dry HCl gas + heated aluminium metal

   (b) aluminium and Cl_2

   (c) conc. HCl and aluminium metal

   (d) dilute HCl and aluminium metal

95. Chloroform on treatment, with concentrated HNO_3, gives

   (a) CCl_3NO_2　　　　(b) $CHCl_2HNO_3$

   (c) $CHCl_2NO_2$　　　(d) $CHCl_2NO_3$

96. The freezing point of a solution, prepared from 1.25 gm of a non-electrolyte and 20 gm of water, is 271.9 K. If molar depression constant is 1.86 K mole^{-1}, then molar mass of the solute will be

   (a) 115.3　　　　　　(b) 106.7

   (c) 105.7　　　　　　(d) 93.9

97. 1-Chlorobutane, on reaction with alcoholic potash (KOH), gives

   (a) 2-Butene

   (b) 1-Butanol

   (c) 1-Butene

   (d) 2-Butanol

98. If acetyl chloride is reduced in the presence of $BaSO_4$ and Pd, then

   (a) CH_3COOH is formed

   (b) CH_3CH_2OH is formed

   (c) CH_3CHO is formed

   (d) CH_3COCH_3 is formed

99. Lyophilic colloids are stable due to

   (a) small size of the particle

   (b) large size of particle

   (c) charge on the particle

   (d) layer of dispersion medium on the particles

100. The correct order of acidic strength is

   (a) HBr < HCl < HI < HF

   (b) HCl < HBr < HF < HI

   (c) HF < HCl < HBr < HI

   (d) HI < HBr < HCl < HF

101. The hybridisation of carbon in diamond, graphite and acetylene is in the order of

   (a) sp sp^2 sp^3

   (b) sp^3 sp^2 sp

   (c) sp^3 sp sp^2

   (d) sp^2 sp^3 sp

102. The oxidation of toluene to benzaldehyde by chromyl chloride is called

   (a) Fittig reaction

   (b) Etard reaction

   (c) Wurtz reaction

   (d) Rosenmund reaction

103. Nitroso amines $(R_2N-N = 0)$ are insoluble in water. On heating them with conc. H_2SO_4, they give secondary amines. This reaction is called
    (a) Liebermann nitroso reaction
    (b) Fries reaction
    (c) Perkin reaction
    (d) Etard reaction

104. In the equation $4M + 8CN^- + 2H_2O + O_2 \rightarrow 4[M(CN)_2]^- + 4OH^{-4}$, identify the metal M.
    (a) gold   (b) iron
    (c) copper   (d) zinc

105. Ozone is prepared by passing silent electric discharge through oxygen. In this reaction
    (a) oxygen is loaded with energy
    (b) energy is absorbed
    (c) energy is given out
    (d) oxygen is dissociated into atoms

106. When cold potassium permanganate $(KMnO_4)$ is added to ethylene gives
    (a) Methanol   (b) Ethanol
    (c) Glycerol   (d) Ethylene glycol

107. One mole of CO_2 contains
    (a) 6.023×10^{23} atoms of oxygen
    (b) 18.1×10^{23} molecules of CO_2
    (c) 3 grams atoms of CO_2
    (d) 6.023×10^{23}

108. A sudden large jump between the values of second and third ionization energies of an element would be associated with which of the following electronic configuration?
    (a) $1s^2, 2s^2 2p^6, 3s^1 3sp^2$
    (b) $1s^2, 2s^2, 2p^6, 3s^2 3p^1$
    (c) $1s^2, 2s^2, 2p^6, 3s^1$
    (d) $1s^2, 2s^2 2p^6, 3s^2$

109. Chlorine is liberated, when we heat
    (a) $Pb(NO_3)_2 + MnO_2$
    (b) $K_2Cr_2O_7 + MnO_2$
    (c) $KMnO_4 + NaCl$
    (d) $K_2Cr_2O_7 + HCl$

110. Oxalic acid, when heated with concentrated H_2SO_4, gives
    (a) H_2O_2 and CO_2 (b) CO and CO_2
    (c) H_2O and CO_2 (d) CO_2 and H_2S

111. Which of the following compounds do not belong to lipids?
    (a) phospho-lipids   (b) amino acids
    (c) fats   (d) carbohydrates

112. A compound is treated with $NaNH_2$ to give sodium salt. Identify the compound.
    (a) C_2H_6 (b) C_6H_6
    (c) C_2H_2 (d) C_2H_4

113. Aspirin is obtained by the reaction of salicylic acid with
    (a) acetic acid
    (b) acetaldehyde
    (c) acetone
    (d) acetic anhydride

114. In the liebermann's nitroso reaction, sequential changes in the colour of phenol occurs as
    (a) red → green → white
    (b) red → deep blue → green
    (c) brown or red → green → red → deep blue
    (d) white → red → green

115. Which of the following is obtained when N_2 reacts with calcium carbide?
    (a) calcium cyanamide
    (b) calcium acetate
    (c) calcium cyanate
    (d) calcium carbonate

116. Identify Z in the reaction $C_2H_5I \xrightarrow{\text{alcoholic KOH}} X \xrightarrow{Br_2} Y \xrightarrow{KCN} Z$
    (a) $BrCH_2CH_2CN$
    (b) $NCCH_2CH_2CN$
    (c) CH_3CH_2CN
    (d) $BrCH = CHCN$

117. If 5.85 grams of NaCl (molecular weight $= 58.5$) is dissolved in 90 grams of water, the mole fraction of NaCl will be
    (a) 0.0196   (b) 0.1
    (c) 0.01   (d) 0.2

118. If $_{90}Th^{22}$ disintegrates to $_{83}Bi^{212}$, then the number of α and β particles emitted is
    (a) 4 α only
    (b) 4 α and 1 β
    (c) 4 α and 7 β
    (d) 7 β only

119. The reaction N_2O_5 in $CCl_{4(solution)} \rightarrow 2NO_{2(solution)}$ $+ 1/2O_{2(g)}$ is of first order in N_2O_5 with rate constant 6.2×10^{-4} s^{-1}. What is the value of rate of reaction when $[N_2O_5] = 1.25$ mole L^{-1}?

   (a) 5.15×10^{-5} mole L^{-1}s^{-1}

   (b) 6.35×10^{-3} mole L^{-1}s^{-1}

   (c) 7.75×10^{-4} mole L^{-1}s^{-1}

   (d) 3.85×10^{-4} mole L^{-1}s^{-1}

120. Which one of the following is the strongest acid?

   (a) CH_3COOH (b) CBr_3COOH

   (c) CF_3COOH (d) CCl_3COOH

121. The correct order of the increasing ionic character is

   (a) $BeCl_2 < BaCl_2 < MgCl_2 < CaCl_2$

   (b) $BeCl_2 < MgCl_2 < BaCl_2 < CaCl_2$

   (c) $BeCl_2 < MgCl_2 < CaCl_2 < BaCl_2$

   (d) $BaCl_2 < CaCl_2 < MgCl_2 < BeCl_2$

122. The reaction of aromatic acyl chloride and phenol in the presence of a base NaOH or pyridine is called

   (a) Sandmayer's reaction

   (b) Perkin's reaction

   (c) Kolbe's reaction

   (d) Schotten Baumann reaction

123. If 0.2 gram of an organic compound containing carbon, hydrogen and oxygen on combustion, yielded 0.147 gram carbon dioxide and 0.12 gram water, what will be the content of oxygen in substance?

   (a) 83.23%

   (b) 78.45%

   (c) 73.29%

   (d) 89.50%

124. An organic compound (a) reacts with sodium metal and forms (b). On heating with conc. H_2SO_4 (a) gives diethyl ether. (a) and (b) are.

   (a) CH_3OH and CH_3ONa

   (b) C_3H_7OH and CH_3ONa

   (c) C_2H_5OH and C_2H_5ONa

   (d) C_4H_9OH and C_4H_9ONa

125. The uncertainity in the momentum of an electron is 1.0×10^{-5} kg m.s.$^{-1}$. The uncertainty in its position will be (h = 6.62×10^{-34} kg. m^2.s^{-1})

   (a) 5.27×10^{-30} m

   (b) 1.05×10^{-26} m

   (c) 1.05×10^{-28} m

   (d) 5.25×10^{-28} m

INTELLIGENCE, LOGIC & REASONING

Directions (Q. 126 – 128) : *Find the odd man out.*

126. (a) Pair   (b) Bird

   (c) Pen   (d) Chair

127. (a) For   (b) Now

   (c) And   (d) If

128. (a) Pack   (b) Packet

   (c) Bundle   (d) Glass

Directions (Q. 129 – 130) : *Choose the correct relation.*

129. FIRE : HOT : ICE : ?

   (a) WATER

   (b) COLD

   (c) WOOD

   (d) ROAD

130. PANKOJ : OBMLNK : SAROD : ?

   (a) RSBPC

   (b) RBQPC

   (c) TBOPC

   (d) PBPQC

Directions (Q. 131 – 132) : *Pick the correct relation from the following statements*

131. B is the father of C, but C is not the son of B. What is C to B ?

   (a) Father   (b) Son

   (c) Daughter   (d) Uncle

132. A is the son of B. C is the uncle of A and D is the wife of B. What is D to A ?

   (a) Niece

   (b) Son

   (c) Daughter

   (d) Mother

Directions (Q. 133 – 135) : *Solve the following problems.*

133. Value of $5 \cot^2\left(\dfrac{\pi}{3}\right) + 2 \sec^2\left(\dfrac{\pi}{6}\right) - \sin^2\left(\dfrac{\pi}{4}\right)$ is

   (a) $\dfrac{5}{3}$ (b) $\dfrac{3}{7}$

   (c) $\dfrac{7}{3}$ (d) $\dfrac{3}{5}$

134. Length of a rope, by which cow must be tethered in order that it may cover an area of 550 m² is

  (a) 17.6 m   (b) 13.2 m

  (c) 9.8 m   (d) 21.5 m

135. What is the sum of money of which $2\frac{2}{3}$ is ₹ 112?

  (a) ₹ 22.00   (b) ₹ 30.00

  (c) ₹ 42.00   (d) ₹ 9.00

ENGLISH LANGUAGE & COMPREHENSION

Directions (Q. 136 – 137) : *Choose synonym from the given words from each set.*

136. REPUTE

  (a) discredit   (b) esteem

  (c) ridiculous   (d) humiliated

137. FEIGN

  (a) wicked   (b) gross

  (c) pretend   (d) sympathy

Directions (Q 138 – 139): *Choose the correct antonym from the given words from each set.*

138. Jolly

  (a) serious   (b) blissful

  (c) cheerful   (d) fun

139. BE-LIKE

  (a) disparage   (b) dwarf

  (c) impossible   (d) underrade

Directions (Q. 140 – 143) : *Choose the incorrect word in the given sentences.*

140. She comes to me each day.

  (a) to   (b) comes

  (c) she   (d) each

141. I haven't some spare pen.

  (a) some   (b) haven't

  (c) I   (d) spare

142. There is a little milk in the jug.

  (a) milk   (b) a

  (c) there   (d) in

143. There are much flowers in this garden

  (a) in   (b) much

  (c) there   (d) this

Directions (Q. 144 – 146) : *Select the Correct sequence of the given jumbled sentences.*

144. 1. At least seven persons were killed.

  P. many of them seriously

  Q. and an unspecified number injured

  R. bound for Patna jumped rail off shortly after the

  S. when the rear bogie of the Rajdhani Express

  6. train had left the Cantonment station here this afternoon.

  (a) QPSR   (b) PQRS

  (c) SPQR   (d) PRQS

145. 1. A friend of yours

  P. has come out successfully through

  Q. because he

  R. with flying colours in

  S. the Secondary School Examination

  6. did his best.

  (a) PQRS   (b) PRSQ

  (c) SRQP   (d) SQRP

146. 1. Chile's military ruler Augusto Pinochet had accepted

  P. reducing the time

  Q. with his opponents

  R. but ruled out negotiations

  S. defeat in the presidential plebiscite

  6. he can remain in office.

  (a) PRSQ   (b) PRQS

  (c) SRQP   (d) PQRS

Direction (Q. 147 – 150) : *Read the passage and answer the following questions :*

The emotional appeal of imperialism never completely stilled the British conscience. However, liberal thinkers throughout the nineteenth century argued that democracy was incompatible with the maintenance of authoritarian rule over foreign peoples. To think imperially was to think in terms of restrictive and protective measures; in defiance of the revealed truths of classical economics. Thus when the British government took over responsibility for India from the East India Company in 1858, many politicians were conscious of saddling Britain with a heavy burden. In the first seventy years of the nineteenth century, enlightened British liberals looked forward to the day when India would stand on its own feet. Even in the stand on its own feet.

Even in the heyday of colonialism British radicals continued to protest that selfproclaimed imperialists, however, honourable their motives, would place fait accompli before the country and commit blunders of incalculable consequence.

147. What do you think were the revealed truth of classical economics ?

  (a) Allowing only subsistence wages to the workers

  (b) Wholesale nationalization of the means of production

  (c) Laissez faire and free trade

  (d) Clamping of artificial restrictions on foreign trade

148. According to the author what was the attitude of the British liberals towards the British imperialist and colonial policy ?

  (a) One of only verbal co-operation

  (b) One of active co-operation

  (c) One total indifference

  (d) One of repeated protests

149. Which class of British society was a force behind the imperialist foreign policy of Britain?

  (a) Middle class

  (b) Common masses

  (c) Labour class

  (d) Aristocracy

150. Give the name of the supreme tactician of the Indian liberation movement?

  (a) Lokmanya Balgangadhar Tilak

  (b) The enlightened British liberals themselves

  (c) Mrs Annie Besant

  (d) Mahatma Gandhi

ANSWERS

MATHEMATICS

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

PHYSICS

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

CHEMISTRY

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

INTELLIGENCE, LOGIC & REASONING

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

ENGLISH LANGUAGE & COMPREHENSION

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