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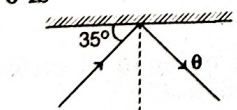
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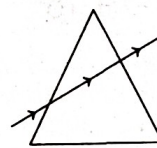
Section I Physics

1. The example of secondary fuel is
(a) natural gas (b) water gas
(c) coal (d) petrol
2. In the following compound, which one has minimum heat value?
(a) Wood (b) Bio gas (c) Alcohol (d) Coal
3. Every hot body object emits
(a) visible rays (b) infrared rays
(c) ultraviolet rays (d) X-rays
4. In the following fuel, which one is different from other?
(a) Cock (b) Lignite (c) Charcol (d) Alcohol
5. Which one of the following fuels cause minimum pollution by burning?
(a) Coal (b) Diesel
(c) Petrol (d) Natural gas
6. Which one of the following is the best nuclear fuel?
(a) Neptunium-239 (b) Uranium-235
(c) Thorium-232 (d) Plutonium-239
7. Per unit mass released energy is
(a) same in nuclear fusion and fission
(b) more in fusion as compare to fission
(c) more in fission as compare to fusion
(d) changed at different times
8. The mass of jupiter is times of mass of earth.
(a) 95 (b) 195 (c) 318 (d) 0.8
9. Which one of the following planet has minimum satellite?
(a) Mass (b) Uranus (c) Neptune (d) Earth
10. Which one of the following is lowest unit of distance?
(a) Astronomical unit (b) Parsec
(c) Light year (d) Kilometre
11. A ray of light falls on a plane mirror at angle of 35° . The value of θ is

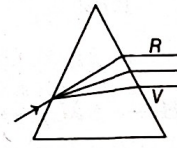


- (a) 35° (b) 45° (c) 55° (d) 90°

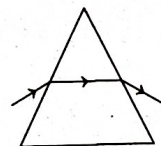
12. In the following mirror, which one is focused light ray at a point?
(a) Plane mirror (b) Convex mirror
(c) Concave mirror (d) Cylindrical mirror
13. A boy stands at 3 m distance from the mirror, if the boy moved away 1 m, then the distance between the boy and its image is
(a) 8 m (b) 4 m (c) 2 m (d) 6 m
14. The image on the retina remain for
(a) $\frac{1}{10}$ s (b) 10 s
(c) 20 s (d) $\frac{1}{20}$ s
15. The unit of refractive index is
(a) dioptre (b) degree (c) metre (d) unitless
16. Whose quality does the human eye use?
(a) Cylindrical lens (b) Convex lens
(c) Concave lens (d) Plane mirror
17. The range of vision of human eye is
(a) infinite to 25 m (b) 1 cm to 25 cm
(c) 100 m to 25 cm (d) infinite to 25 cm
18. When a monochromatic light passes through a prism, then which of the ray diagram is correct?



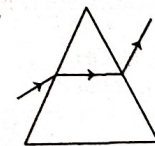
(a)



(b)



(c)



(d)

19. Which one of the following mirror is used in the head light of car?
(a) Plane mirror (b) Concave mirror
(c) Convex mirror (d) Parabolic mirror

20. How many electrons flows $1 \mu\text{A}$ current in 1 s ?
 (a) 625×10^9 (b) 625×10^{12}
 (c) 625×10^6 (d) 625×10^{15}
21. A person connects the four cell of $\frac{1}{4} \Omega$ in series combination but one cell terminal is opposite. The external resistance is 1Ω and the electromotive force of cell is 1.5 V . The value of current in the circuit
 (a) $\frac{3}{4} \text{ A}$ (b) $\frac{3}{2} \text{ A}$ (c) $\frac{4}{3} \text{ A}$ (d) zero
22. A wire of 1Ω resistance is stretched and its length becomes twice, then the new resistance of the wire
 (a) $\frac{1}{4} \Omega$ (b) 2Ω (c) $\frac{1}{2} \Omega$ (d) 4Ω
23. Electric potential is
 (a) vector quantity
 (b) scalar quantity
 (c) Neither (a) nor (b)
 (d) some time scalar quantity and some time vector quantity
24. The heating coil of an electric heater should be made with a material, which should have
 (a) low specific resistance and high melting point
 (b) high specific resistance and low melting point
 (c) high specific resistance and high melting point
 (d) low specific resistance and low melting point
25. To convert a galvanometer into voltmeter, which one of the following required?
 (a) Connect the low resistance in parallel combination
 (b) Connect the high resistance in series combination
 (c) Connect the low resistance in series combination
 (d) Connect the high resistance in parallel combination
26. A 220V , 100 W bulb is connected with 110 V . The power consumed by bulb is
 (a) 25 W (b) 20 W
 (c) 10 W (d) 50 W
27. Three resistance of 12Ω are connected in the form of an equilateral triangle. The effective resistance between two corners, is
 (a) 24Ω (b) 9Ω
 (c) 12Ω (d) 8Ω
28. The internal resistance of ideal cell is
 (a) zero (b) 1.0Ω
 (c) 0.5Ω (d) infinite
29. The law of electrolysis is given by
 (a) Lenz (b) Maxwell
 (c) Faraday (d) Bohr
30. The Fleming's left hand rule middle finger indicates the direction of
 (a) magnetic field (b) electric current
 (c) motion (d) momentum

Section II Chemistry

31. Lassaigne's test is used for the detection of nitrogen by use of which compound?
 (a) NH_2CONH_2 (b) $\text{NH}_2\text{NH}_2\text{Cl}$
 (c) $\text{NH}_2\text{CONHNH}_2\text{HCl}$ (d) $\text{C}_6\text{H}_5\text{NHNH}_2\text{HCl}$
32. The size of nucleus is
 (a) 10^{-10} m (b) 10^{-9} m (c) 10^{-3} m (d) 10^{-15} m
33. gas released, when zinc reacts with hydrochloric acid.
 (a) Hydrogen chloride (b) Chlorine
 (c) Hydrogen (d) Oxygen
34. Which is not electrophilic in nature?
 (a) BH_3 (b) Cl^- (c) NO_3^- (d) H_3O^+
35. Reaction

$$\text{CH}_2 = \text{CH}_2 \xrightarrow{\text{HOCl}} \text{M} \xrightarrow{\text{R}} \begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$$
 molecule M and reagent R respectively are
 (a) $\text{CH}_2\text{Cl}-\text{CH}_2\text{OH}$, aq. NaHCO_3
 (b) $\text{CH}_3\text{CH}_2\text{OH}$, H_2SO_4
 (c) $\text{CH}_3\text{CH}_2\text{Cl}$, NaOH
 (d) CH_2-CH_2 , heat
36. The compound formed as a result of compound

$$\text{CH}_3-\text{C}=\text{C}-\text{CH}_3$$

$$\begin{array}{c} | \quad | \\ \text{CH}_3 \quad \text{H} \end{array}$$
 reacts with KMnO_4
 (a) $\text{CH}_3\text{COCH}_3 + \text{CH}_3\text{COOH}$ (b) CH_3COCH_3
 (c) $\text{CH}_3\text{CHO} + \text{CO}_2$ (d) $\text{CH}_3\text{COCH}_3 + \text{CH}_3\text{CHO}$
37. Which metal oxide cannot be reduced by carbon?
 (a) PbO (b) Al_2O_3 (c) Fe_2O_3 (d) ZnO
38. Which pair gives the same gaseous product by reacts with H_2O ?
 (a) Na , Na_2O_2 (b) K , KO_2
 (c) Ca , CaH_2 (d) Ba , BaO_2
39. Which metal react with very dilute HNO_3 to evolve hydrogen gas?
 (a) Fe (b) Al (c) Mg (d) Cu
40. Which of the following does not react with O_2 directly?
 (a) Na (b) Cl (c) P (d) S
41. Which of the following species contains 4 lone pair?
 (a) Cl^- (b) O^- (c) Na (d) Mg
42. A solution with H^+ ion concentration of 0.01 M has a pH of
 (a) 3 (b) 1 (c) 2 (d) 7
43. The pH of stomach fluids is approximately.
 (a) 5.3 (b) 1.4 (c) 7.4 (d) 8.2
44. Which element reacts with chlorine and forms more than one compounds?
 (a) K (b) Zn
 (c) Fe (d) Ca
45. Which increasing order of electronegativity of the given element is correct?
 (a) Si , P , C , N (b) N , Si , C , P
 (c) C , N , Si , P (d) P , Si , N , C

46. Which electronic ion have maximum size?
(a) F^- (b) O^{2-} (c) N^{3-} (d) Na^+
47. Which of the following is used finishing silvering of mirror?
(a) Pb (b) Ag (c) Na (d) Al
48. Which of following makes liquid soap?
(a) Ca (b) K (c) Na (d) Li
49. Which gas convert methanol (CH_3OH) to acetic acid (CH_3COOH) at high temperature and pressure with catalysts?
(a) N_2 (b) CO_2 (c) CO (d) O_2
50. A compound was found to contain nitrogen and oxygen in the ration 28 g : 80 g. The formula of the compound is
(a) N_2O_3 (b) N_2O_5 (c) NO (d) NO_3
51. 27 g of Aluminium will react completely with how many grams of oxygen?
(a) 32 (b) 16 (c) 8 (d) 24
52. In HCHO, oxidation number of carbon is
(a) 0 (b) +2 (c) -2 (d) +4
53. If molecular weight of $KMnO_4$ is M then its equivalent weight in acidic medium would be
(a) $\frac{M}{5}$ (b) $\frac{M}{3}$ (c) M (d) $\frac{M}{7}$
54. Which compound is an isomer of 2-methylpropane?
(a) *n*-butane (b) *n*-propane
(c) *n*-hexane (d) *n*-pentane
55. Which C—C bond length is minimum in the following compounds?
(a) C_2H_4 (b) C_2H_6
(c) CH_4 (d) $C \equiv C$
56. What was the first synthetically produced organic compound?
(a) NH_2CONH_2 (b) C_2H_5OH
(c) CH_3OH (d) CH_3COOH
57. Huckel's rule estimates whether a planar ring molecule will have aromatic properties, if number of electron has
(a) 4π (b) $(4\pi + 2n)$
(c) $(4n + 2\pi)$ (d) $(4\pi + 2)n$
58. Which of the following molecule is an optically active molecule?
(a) 2-chlorobutane (b) 1-propanol
(c) 1-butanol (d) 4-hydroxy heptane
59. A strong base can abstract an α -hydrogen from
(a) amine (b) ketone (c) alkene (d) alkane
60. How many sigma bonds in CH_4 ?
(a) 1 (b) 2 (c) 3 (d) 4

Section III Mathematics

61. If θ is an acute angle and $\frac{\cos^2 \theta}{\cot^2 \theta - \cos^2 \theta} = 3$, then value of θ is
(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{6}$
62. If $x = r \sin \alpha \cdot \cos \beta$, $y = r \sin \alpha \cdot \sin \beta$ and $z = r \cos \alpha$, then value of $x^2 + y^2$ is
(a) r^2 (b) $r^2 + z^2$ (c) $r^2 - z^2$ (d) $-z^2$
63. Average age of 30 girls is 14 yr. If 5 girls of average age of 15 yr leave the class, then find the average age of remaining girls.
(a) 13.8 yr (b) 12.8 yr (c) 9 yr (d) 14 yr
64. Median of series 37.5, 35, 38.5, 31, 27, 39, 34 30.5 is
(a) 31 (b) 35 (c) 34 (d) 37.5
65. To find the value of histogram, which helps
(a) Mode (b) Median
(c) Arithmetic mean (d) Geometric mean
66. If mean and median of a set of number is 8.9 and 9 respectively, then value of mode is
(a) 9.2 (b) 8.2 (c) 7.2 (d) 10.2
67. Mode of 2, 3, 1, 2, 5, 3, 2, 2, 3, 5 is
(a) 3 (b) 2 (c) 1 (d) 5
68. An equilateral triangle has an equal perimeter to an square. If diagonal of an square is $6\sqrt{2}$ cm, then area of triangle is
(a) $12\sqrt{2}$ cm^2 (b) $16\sqrt{3}$ cm^2 (c) $16\sqrt{2}$ cm^2 (d) $12\sqrt{3}$ cm^2
69. If the difference between the circumference of circle and radius is 37 cm, then the area of circle is
(a) 259 cm^2 (b) $16\sqrt{3}$ cm^2
(c) $16\sqrt{2}$ cm^2 (d) 154 cm^2
70. If the outer diameter of metal pipe is 4 cm and inner diameter is 3 cm. Its length is 20 cm, then the volume of metal used is
(a) 220 cm^3 (b) 110 cm^3 (c) 22 cm^3 (d) 440 cm^3
71. An diagonal of rectangle is thrice to its small side, then find the ratio of its sides
(a) $\sqrt{3} : 1$ (b) $3 : 2$ (c) $2\sqrt{2} : 1$ (d) $\sqrt{2} : 1$
72. If the length of minute hand of a watch is 14 cm, then the area swept by it in 5 min.
(a) 50.3 cm^2 (b) 51.3 cm^2
(c) 52.3 cm^2 (d) 53.1 cm^2
73. An observer of length 1.5 m is standing away from 30 m from a tower. Angle of depression from eye is 45° , then the height of tower is
(a) 30 m (b) 31.5 m (c) 28.5 m (d) 29.5 m
74. If $f(x) = x^2 + 5x + p$ and $g(x) = x^2 + 3x + q$ has one can man factor, then value of $(p - q)^2$ is
(a) $2(5p - 3q)$ (b) $2(3p - 5q)$
(c) $3p - 5q$ (d) $5p - 3q$
75. If the capacities of two hemisphere vessels is 6.4 L and 21.6 L, then the ratio of curved surface area is
(a) 4 : 9 (b) 2 : 3 (c) $\sqrt{2} : \sqrt{3}$ (d) 16 : 81

- 76.** If base radius of cylinder is $1\frac{2}{3}$ times to its height. If the total cost of paint to its curved surface area at the rate of 2 paise per sq.cm is ₹ 92.40, then its volume is
 (a) 80850 cm³ (b) 80580 cm³
 (c) 4025 cm³ (d) 40290 cm³
- 77.** A can do a work in 20 days. B can do a work in 30 days and C can do a work in 60 days. If 'B' and 'C' helps A after three days, then how many days after work will complete?
 (a) 12 days (b) 15 days
 (c) 18 days (d) 10 days
- 78.** Sum of additive and multiplicative inverse of 2 is
 (a) $\frac{1}{2}$ (b) $-\frac{3}{2}$
 (c) $\frac{3}{2}$ (d) $-\frac{1}{2}$
- 79.** If HCF of $(3x^2 + 14x + 16)$ and $(6x^3 + 11x^2 - 4x - 4)$ is $(x - k)$, then value of k is
 (a) $\frac{2}{3}$ (b) 2
 (c) -2 (d) $-\frac{1}{2}$
- 80.** Inverse of $-3 + \frac{5}{x-2}$ is
 (a) $\frac{x-2}{11-3x}$ (b) $-3 + \frac{x-2}{5}$
 (c) $-\frac{1}{3} + \frac{x-2}{5}$ (d) $3 - \frac{5}{x-2}$
- 81.** Which of the following option is satisfied for the values of $2x - 3 > 7 - x$?
 (a) $x = \frac{10}{3}$ (b) $x < \frac{10}{3}$ (c) $x > 4$ (d) $x > \frac{10}{3}$
- 82.** If the ratio of roots of equation $3x^2 - kx + 14 = 0$ is 7 : 6, then value of k is
 (a) 1 (b) 12 (c) 13 (d) -3
- 83.** If m th term of an arithmetic series is $\frac{1}{n}$ and n th term is $\frac{1}{m}$, then its (mn) th term is
 (a) $\frac{1}{mn}$ (b) 1 (c) 0 (d) mn
- 84.** If intrinsic angle of polygon are in arithmetic series and its smallest angle is 100° and maximum angle is 140° , then number of sides of polygon is
 (a) 6 (b) 10
 (c) 11 (d) 5
- 85.** By joining the consecutive mid points of a parallelogram, we get a figure of
 (a) Rectangle (b) Rhombus
 (c) Square (d) Parallelogram
- 86.** Point $P(4, 6)$ divides the line segment $A(-2, 3)$ and $B(6, 7)$ in the ratio
 (a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{3}{1}$ (d) $\frac{3}{2}$
- 87.** A die is thrown, then probability of getting a sum number
 (a) $\frac{1}{6}$ (b) $\frac{1}{36}$
 (c) $\frac{1}{12}$ (d) $\frac{1}{2}$
- 88.** If $\frac{\cos \theta}{a} = \frac{\sin \theta}{b}$, then value of $\frac{a}{\sec 2\theta} + \frac{b}{\cos \theta}$ is
 (a) a (b) b (c) $\frac{a}{b}$ (d) $a + b$
- 89.** If $x = \sqrt{3} + \sqrt{2}$, then value of $(x^2 + \frac{1}{x^2})$ is
 (a) $2\sqrt{3}$ (b) 10 (c) 12 (d) 14
- 90.** A radius of circle is 2.5 cm AB and CD two parallel chords are at distance of 2.7 cm. If $AB = 4.8$ cm, then value of CD is
 (a) 4.8 cm (b) 2.4 cm
 (c) 3 cm (d) 4 cm

Answers

1.	(b)	2.	(a)	3.	(b)	4.	(d)	5.	(d)	6.	(b)	7.	(c)	8.	(c)	9.	(d)	10.	(d)
11.	(a)	12.	(c)	13.	(a)	14.	(a)	15.	(d)	16.	(b)	17.	(d)	18.	(c)	19.	(b)	20.	(b)
21.	(d)	22.	(d)	23.	(b)	24.	(c)	25.	(b)	26.	(a)	27.	(d)	28.	(a)	29.	(c)	30.	(b)
31.	(d)	32.	(d)	33.	(c)	34.	(b)	35.	(a)	36.	(a)	37.	(b)	38.	(c)	39.	(c)	40.	(b)
41.	(a)	42.	(c)	43.	(b)	44.	(c)	45.	(a)	46.	(c)	47.	(b)	48.	(b)	49.	(b)	50.	(b)
51.	(d)	52.	(a)	53.	(c)	54.	(a)	55.	(d)	56.	(a)	57.	(c)	58.	(a)	59.	(b)	60.	(a)
61.	(b)	62.	(c)	63.	(a)	64.	(b)	65.	(a)	66.	(a)	67.	(b)	68.	(b)	69.	(d)	70.	(b)
71.	(c)	72.	(b)	73.	(b)	74.	(b)	75.	(a)	76.	(a)	77.	(b)	78.	(b)	79.	(c)	80.	(a)
81.	(d)	82.	(c)	83.	(b)	84.	(a)	85.	(d)	86.	(c)	87.	(d)	88.	(a)	89.	(b)	90.	(c)