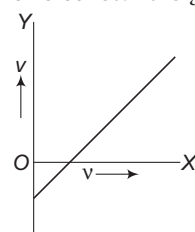


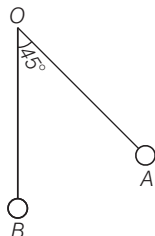
MET 2018 Memory Based Question Paper PDF

Physics

- At great distances from an electric dipole, the electric field strength due to the dipole varies with the distance as
 - $\frac{1}{r}$
 - $\frac{1}{r^2}$
 - $\frac{1}{r^3}$
 - $\frac{1}{r^4}$
- A charged particle travels along a straight line with a speed v in a region where both electric field $\mathbf{E}$ and magnetic fields $\mathbf{B}$ are present. It follows that
 - $|\mathbf{E}| = v |\mathbf{B}|$ and the two fields are parallel
 - $|\mathbf{E}| = v |\mathbf{B}|$ and the two fields are perpendicular
 - $|\mathbf{B}| = v |\mathbf{E}|$ and the two fields are parallel
 - $|\mathbf{B}| = v |\mathbf{E}|$ and the two fields are perpendicular
- A solenoid of length 50 cm and a radius of cross-section 1 cm has 1000 turns of wire wound over it. If the current carried is 5A, the magnetic field on its axis, near the centre of the solenoid is approximately (permeability of free space $\mu_0 = 4\pi \times 10^{-7} \text{ T-m/A}$)
 - $0.63 \times 10^{-2} \text{ T}$
 - $1.26 \times 10^{-2} \text{ T}$
 - $2.51 \times 10^{-2} \text{ T}$
 - 6.3 T
- A transformer of 100% efficiency has 200 turns in the primary and 40000 turns in secondary. It is connected to a 220 V main supply and secondary feeds to a 100 k Ω resistance. The potential difference per turn is
 - 1.1 V
 - 25 V
 - 18 V
 - 11 V
- In a single slit diffraction pattern, the distance between the first minimum on the left and the first minimum on the right is 5 mm. The screen on which the diffraction pattern is displayed is at a distance of 80 cm from the slit. The wavelength is 6000 Å. The slit width in (mm) is about
 - 0.576
 - 0.348
 - 0.192
 - 0.096
- When a ray is incident on a medium of refractive index n at Brewster's angle, it gets
 - totally reflected
 - totally absorbed
 - circularly polarised
 - plane polarised
- The binding energy per nucleon is maximum in the case of
 - ${}^4_2\text{He}$
 - ${}^{56}_{26}\text{Fe}$
 - ${}^{141}_{56}\text{Ba}$
 - ${}^{225}_{92}\text{U}$
- A thin convex lens of refractive index 1.5 has 20 cm focal length in air. If the lens is completely immersed in a liquid of refractive index 1.6, its focal length will be
 - 160 cm
 - 100 cm
 - + 10 cm
 - + 100 cm
- A mass $3m$, initially at rest at the origin explodes into three fragments of equal mass. Two of the fragments have speed v each and move perpendicular to each other. The third fragment will move with a speed
 - $\frac{v}{\sqrt{2}}$
 - $\frac{v}{2}$
 - v
 - $v\sqrt{2}$

- 10.** Standing waves are formed on a string when interference occurs between two waves having
- the same amplitude travelling in the same direction with no phase difference between them
 - the same amplitude, travelling in the opposite direction with no phase difference between them
 - different amplitudes travelling in the same direction
 - different amplitudes travelling in the opposite direction
- 11.** An open tank filled with water (density) ρ has a narrow hole at a depth of h below the water surface. The velocity of water flowing out is
- $h\rho g$
 - $2gh$
 - $\sqrt{2gh}$
 - gh
- 12.** Three concurrent forces of the same magnitude are in equilibrium. What is the angle between the forces? Also, name the triangle formed by the forces as sides
- 60° equilateral triangle
 - 120° equilateral triangle
 - $120^\circ, 30^\circ, 30^\circ$ an isosceles triangle
 - 120° an obtuse triangle
- 13.** A straight conductor carries a current of 5 A. An electron travelling with a speed of $5 \times 10^6 \text{ ms}^{-1}$ parallel to the wire at a distance of 0.1 m from the conductor, experiences a force of
- $8 \times 10^{-20} \text{ N}$
 - $3.2 \times 10^{-19} \text{ N}$
 - $8 \times 10^{-18} \text{ N}$
 - $1.6 \times 10^{-19} \text{ N}$
- 14.** A uniform wire of resistance 9Ω is cut into 3 equal parts. They are connected in the form of equilateral triangle ABC . A cell of emf 2V and negligible internal resistance is connected across B and C. Potential difference across AB is
- 1 V
 - 2 V
 - 3 V
 - 0.5 V
- 15.** In a potentiometer experiment two cells of emf E_1 and E_2 are used in series and in conjunction and the balancing length is found to be 58 cm of the wire. If the polarity of E_2 is reversed, then the balancing length becomes 29 cm. The ratio $\frac{E_1}{E_2}$ of the emfs of the two cells is
- 1 : 1
 - 2 : 1
 - 3 : 1
 - 4 : 1
- 16.** A spring balance is attached to the ceiling of a lift. A man hangs his bag on the spring and the spring reads 49 N, when the lift is stationary. If the lift moves downward with an acceleration of 5 m/s^2 , the reading of the spring balance will be
- 49 N
 - 24 N
 - 74 N
 - 15 N
- 17.** A body cools in 7 min from 60°C to 40°C . What times (in min) does it take to cool from 40°C to 28°C , if surrounding temperature is 10°C ? (Assume Newton's law of cooling)
- 3.5
 - 14
 - 7
 - 10
- 18.** The stopping potential for photoelectric emission from a metal surface is plotted along Y-axis and frequency ν of incident light along X-axis. A straight line is obtained as shown. Planck's constant is given by
- 
- slope of the line
 - product of slope of the line and charge on the electron
 - intercept along Y-axis divided by charge on the electron
 - product of intercept along X-axis and mass of the electron
- 19.** A parallel beam of monochromatic light is incident normally on a slit. The diffraction pattern is observed on a screen placed at the focal plane of a convex lens. If the slit width is increased, the central maximum of the diffraction pattern will
- become broader and fainter
 - become broader and brighter
 - become narrower and fainter
 - become narrower and brighter

- 20.** The bob A of a simple pendulum is released when the string makes an angle of 45° with the vertical. It hits an other bob B of the same material and same mass kept at rest on the table. If the collision is elastic

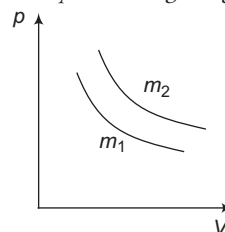


- (a) both A and B rise to the same height
 (b) both A and B come to rest at B
 (c) both A and B move with the same velocity of A
 (d) A comes to rest and B moves with the velocity of A
- 21.** A battery of emf 12 V and internal resistance $2\ \Omega$ is connected in series with a tangent galvanometer of resistance $4\ \Omega$. The deflection is 60° when the plane of the coil is along the magnetic meridian. To get a deflection of 30° , the resistance to be connected in series with the tangent galvanometer is
- (a) $12\ \Omega$ (b) $20\ \Omega$
 (c) $10\ \Omega$ (d) $5\ \Omega$
- 22.** A transistor is used in common-emitter configuration. Given its $\alpha = 0.9$, calculate the change in collector current when the base current changes by $2\ \mu\text{A}$.
- (a) $1\ \mu\text{A}$ (b) $0.9\ \mu\text{F}$
 (c) $30\ \mu\text{A}$ (d) $18\ \mu\text{A}$
- 23.** Energy needed in breaking a drop of radius R into n drops of radii r is given by
- (a) $4\pi T (nr^2 - R^2)$
 (b) $\frac{4}{3} \pi (r^3 n - R^2)$
 (c) $4\pi T (R^2 - nr^2)$
 (d) $4\pi T (nr^2 + R^2)$
- 24.** A gas at the temperature 250 K is contained in a closed vessel. If the gas is heated through 1 K , then percentage increase in its pressure will be
- (a) 0.4% (b) 0.2%
 (c) 0.1% (d) 0.8%

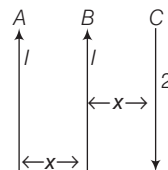
- 25.** Voltage and current in an AC circuit are given by $V = 5 \sin \left(100\pi t - \frac{\pi}{6} \right)$ and

$$I = 4 \sin \left(100\pi t + \frac{\pi}{6} \right)$$

- (a) voltage leads the current by 30°
 (b) current leads the voltage by 30°
 (c) current leads the voltage by 60°
 (d) voltage leads the current by 60°
- 26.** A bar magnet is released into a copper ring directly below it. The acceleration of the magnet will be
- (a) equal to the acceleration due to gravity at that place
 (b) less than the acceleration due to gravity at that place
 (c) greater than the acceleration due to gravity at that place
 (d) twice the acceleration due to gravity at that place
- 27.** Two different isotherms representing the relationship between pressure p and volume V at a given temperature of the same ideal gas are shown for masses m_1 and m_2 of the gas respectively in the figure given, then



- (a) $m_1 > m_2$ (b) $m_1 = m_2$ (c) $m_1 < m_2$ (d) $m_1 \geq m_2$
- 28.** A , B and C are parallel conductors of equal lengths carrying currents I , I and $2I$ respectively. Distance between A and B is x .



Distance between B and C is also x . F_1 is the force exerted by B on A . F_2 is the force exerted by C on A . Choose the correct answer.

- (a) $F_1 = 2F_2$ (b) $F_2 = 2F_1$
 (c) $F_1 = F_2$ (d) $F_1 = -F_2$

- 29.** The light ray is incident at angle of 60° on a prism of angle 45° . When the light rays falls on the other surface at 90° , the refractive index of the material of prism μ and the angle of deviation δ are given by

(a) $\mu = \sqrt{2}$, $\delta = 30^\circ$ (b) $\mu = 1.5$, $\delta = 15^\circ$
 (c) $\mu = \frac{\sqrt{3}}{2}$, $\delta = 30^\circ$ (d) $\mu = \frac{\sqrt{3}}{2}$, $\delta = 15^\circ$

- 30.** A plano-convex lens is made of refractive index of 1.6. The radius of curvature of the curved surface is 60 cm. The focal length of the lens is

(a) 400 cm (b) 200 cm (c) 100 cm (d) 50 cm

- 31.** A body of mass 2 kg makes an elastic collision with another body at rest and continues to move in the original direction with one-fourth its original speed. The mass of the second body which collides with the first body is

(a) 2 kg (b) 1.2 kg (c) 3 kg (d) 1.5 kg

- 32.** A research satellite of mass 200 kg circle the earth in an orbit of average radius $\frac{3R}{2}$, where

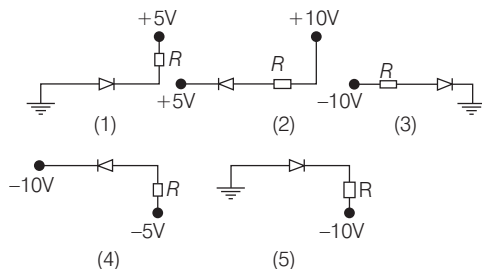
R is the radius of the earth. Assuming the gravitational pull on a mass of 1 kg on the earth's surface to be 10 N, the pull on the satellite will be

(a) 880 N (b) 889 N (c) 890 N (d) 892 N

- 33.** A semiconductor has an electron concentration of $8 \times 10^{13}/\text{m}^3$ and hole concentration of $5.5 \times 10^{12}/\text{m}^3$. The semiconductor is

(a) n -type (b) p -type
(c) intrinsic semiconductor (d) p - n junction

- 34.** In the figure shown below, which of the diodes are forward biased ?



(a) 1, 2, 3 (b) 2, 4, 5 (c) 1, 3, 4 (d) 2, 3, 4

- 35.** The path difference between the two waves

$$y_1 = a_1 \sin \left(\omega t - \frac{2\pi x}{\lambda} \right) \text{ and}$$

$$y_2 = a_2 \cos \left(\omega t - \frac{2\pi x}{\lambda} + \phi \right) \text{ is}$$

(a) $\frac{\lambda}{2\pi} \phi$ (b) $\frac{\lambda}{2\pi} \left(\phi + \frac{\pi}{2} \right)$
 (c) $\frac{2\pi}{\lambda} \left(\phi - \frac{\pi}{2} \right)$ (d) $\frac{2\pi}{\lambda} \phi$

- 36.** An electric motor operates on a 50 V supply and a current of 12 A. If the efficiency of the motor is 30%, what is the resistance of the winding of the motor ?

(a) 6 Ω (b) 4 Ω
(c) 2.9 Ω (d) 3.1 Ω

- 37.** Two long straight wires are set parallel to each other. Each carries a current in the same direction and the separation between them is $2r$. The intensity of the magnetic field mid-way between them is

(a) $\frac{\mu_0 i}{r}$ (b) $\frac{4\mu_0 i}{r}$
 (c) zero (d) $\frac{\mu_0 i}{4r}$

- 38.** A galvanometer of resistance 20 Ω is to be converted into an ammeter of range 1 A. If a current of 1 mA produces full scale deflection, the shunt required for the purpose is

(a) 0.01 Ω (b) 0.05 Ω
(c) 0.02 Ω (d) 0.04 Ω

- 39.** In a step-up transformer the voltage in the primary is 220 V and the current is 5 A. The secondary voltage is found to be 22000 V. The current in the secondary (neglect losses) is

(a) 5 A (b) 50 A
(c) 500 A (d) 0.05 A

- 40.** In Young's double slit experiment, the intensity of light coming from one of the slits is double the intensity from the other slit.

The ratio of the maximum intensity to the minimum intensity in the interference fringe pattern observed is

- (a) 34 (b) 40 (c) 25 (d) 38

- 41.** The distance between charges $5 \times 10^{-11} \text{ C}$ and $-2.7 \times 10^{-11} \text{ C}$ is 0.2 m. The distance at which is third charge should be placed from $4e$ in order that it will not experience any force along the line joining the two charges is

- (a) 0.44 m (b) 0.65 m
(c) 0.556 m (d) 0.350 m

- 42.** Small rain drops of the same size are charged to potential V volt each. If n such drops coalesce to form a single drop, then the potential of the bigger drop is

- (a) $n^{1/3} V$ (b) $n^{2/3} V$
(c) nV (d) $n^{3/2} V$

- 43.** A small sphere is charged to a potential of 50 V and a big hollow sphere is charged to potential of 100 V. Charge will flow from the smaller sphere to the bigger one when

- (a) the smaller one is placed inside the bigger one and connected by a wire
(b) the bigger one is placed inside the smaller one and connected by means of a wire
(c) bigger one placed by the side of the smaller one and connected by a wire
(d) smaller one placed by the side of the bigger one

- 44.** If refractive index of a material of equilateral prism is $\sqrt{3}$, then angle of minimum deviation of the prism is

- (a) 30° (b) 45°
(c) 60° (d) 75°

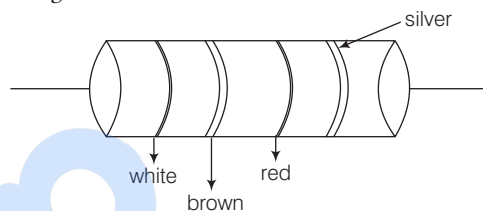
- 45.** A long solenoid of length L has a mean diameter D . It has n layers of winding of N turns each. If it carries a current i , the magnetic field at its centre will be

- (a) proportional to D
(b) inversely proportional to D
(c) independent of D
(d) proportional to L

- 46.** A wire of length 100 cm is connected to a cell of emf 2 V and negligible internal resistance. The resistance of the wire is 3Ω , the additional resistance required to produce a potential difference of 1 mV/cm is

- (a) 60Ω (b) 47Ω (c) 57Ω (d) 35Ω

- 47.** In the figure a carbon resistor has bands of different colours on its body as mentioned in the figure. The value of the resistance is



- (a) $2.2 \text{ k}\Omega$ (b) $3.3 \text{ k}\Omega$ (c) $5.6 \text{ k}\Omega$ (d) $9.1 \text{ k}\Omega$

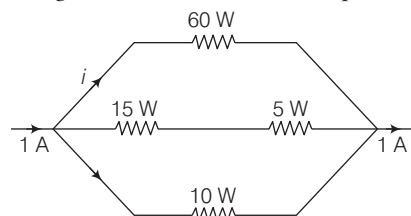
- 48.** The mass defect in a particular nuclear reaction is 0.3 g. The amount of energy liberated in kilowatt hour is (velocity of light $= 3 \times 10^8 \text{ m/s}$)

- (a) 1.5×10^6 (b) 2.5×10^6
(c) 3×10^6 (d) 7.5×10^6

- 49.** A photon and an electron have equal energy $E \cdot \lambda_{\text{photon}} / \lambda_{\text{electron}}$ is proportional to

- (a) $\sqrt{E}$ (b) $\frac{1}{\sqrt{E}}$
(c) $\frac{1}{E}$ (d) does not depend upon E

- 50.** The magnitude of current i in ampere unit is



- (a) 0.1 (b) 0.3
(c) 0.6 (d) None of these

Chemistry

1. If 20 g of CaCO_3 is treated with 100 mL of 20% HCl solution, the amount of CO_2 produced is
 (a) 22.4 L (b) 8.80 g (c) 4.40 g (d) 2.24 L
2. A certain amount of a metal whose equivalent mass is 28 displaces 0.7 L of H_2 at STP from an acid. Hence, mass of the element is
 (a) 1.75 g (b) 0.875 g (c) 3.50 g (d) 7.00 g
3. In the atomic spectrum of hydrogen, the spectral lines pertaining to electronic transition of $n = 4$ to $n = 2$ refers to
 (a) Lyman series (b) Balmer series
 (c) Paschen series (d) Brackett series
4. The electron affinity of Be is almost similar to that of
 (a) Li (b) B
 (c) Na (d) Ne
5. For a process to be spontaneous
 (a) ΔG must be -ve (b) ΔG should be +ve
 (c) ΔH must be -ve (d) ΔS must be -ve
6. pH of an acid buffer is given by
 (a) $\text{pH} = \text{pK}_a + \log \frac{[\text{Salt}]}{[\text{Acid}]}$
 (b) $\text{pH} = \text{pK}_a - \log \frac{[\text{Salt}]}{[\text{Acid}]}$
 (c) $\text{pH} = \text{K}_a + \log \frac{[\text{Salt}]}{[\text{Acid}]}$
 (d) None of the above
7. In $\text{S}_\text{N}1$ reaction, the racemization takes place. It is due to
 (a) inversion of configuration
 (b) retention of configuration
 (c) conversion of configuration
 (d) Both (a) and (b)
8. When phenol is treated with excess of bromine water it gives
 (a) *m*-bromophenol
 (b) *o*- and *p*-bromophenol
 (c) 2, 4-dibromophenol
 (d) 2, 4, 6-tribromophenol
9. $\text{CH}_3\text{COOH} + \text{NH}_3 \longrightarrow \text{X} \xrightarrow{\Delta} \text{Y}$; Y is
 (a) CH_3NH_2 (b) $\text{CH}_3\text{CH}_2\text{NH}_2$
 (c) CH_3CONH_2 (d) $\text{CH}_3\text{COONH}_4$
10. Coordination number of Zn in ZnS is
 (a) 4 (b) 6
 (c) 2 (d) None of these
11. What is the order of the reaction which has a rate expression

$$\text{rate} = k [A]^{\frac{3}{2}} [B]^{-1} ?$$
 (a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) zero (d) None of these
12. 99% of a first order reaction was completed in 32 min. When will 99.9% of the reaction complete ?
 (a) 50 min (b) 46 min
 (c) 49 min (d) 48 min
13. Which one of the following solutions exhibits the maximum elevation in boiling point ?
 (a) 0.1 m NaCl (b) 0.1 m FeCl_3
 (c) 0.1m CaCl_2 (d) 0.1 m BaCl_2
14. The coefficients of I^- , IO_3^- and H^+ in the redox reaction,

$$\text{I}^- + \text{IO}_3^- + \text{H}^+ \longrightarrow \text{I}_2 + \text{H}_2\text{O}$$
 in the balanced form respectively are
 (a) 5, 1, 6 (b) 1, 5, 6
 (c) 6, 1, 5 (d) 5, 6, 1
15. Lyophilic sols are more stable than lyophobic sols because
 (a) the colloidal particles have negative charge
 (b) the colloidal particles have positive charge
 (c) the colloidal particles are solvated
 (d) None of the above
16. Which of the following will give positive iodoform test ?
 (a) HCHO (b) CH_3OCH_3
 (c) $(\text{CH}_3)_2\text{CO}$ (d) $\text{CH}_3\text{CH}_2\text{Cl}$
17. Starch is the polymer of
 (a) glucose (b) fructose
 (c) Both (a) and (b) (d) None of these

- 18.** The type of isomerism present in nitropentamine chromium (III) chloride is
 (a) optical (b) coordination
 (c) linkage (d) polymerisation
- 19.** The standard reduction potentials for two half-cell reactions are given below.

$$\text{Cd}^{2+}(\text{aq}) + 2\text{e}^{-} \longrightarrow \text{Cd}(\text{s}); E^{\circ} = -0.40 \text{ V}$$

$$\text{Ag}^{+}(\text{aq}) + \text{e}^{-} \longrightarrow \text{Ag}(\text{s}); E^{\circ} = 0.80 \text{ V}$$
 The standard free energy change for the reaction

$$2\text{Ag}^{+}(\text{aq}) + \text{Cd}(\text{s}) \longrightarrow 2\text{Ag}(\text{s}) + \text{Cd}^{2+}(\text{aq})$$
 is given by
 (a) 115.8 kJ (b) - 115.8 kJ
 (c) - 231.6 kJ (d) 231.6 kJ
- 20.** Which of the following ions has the highest magnetic moment?
 (a) Zn^{2+} (b) Ti^{3+} (c) Sc^{3+} (d) Mn^{2+}
- 21.** Cane sugar charrs on treating with conc. H_2SO_4 . It is because
 (a) H_2SO_4 is oxidising agent
 (b) H_2SO_4 is dehydrating agent
 (c) H_2SO_4 is an acid
 (d) H_2SO_4 is a catalyst
- 22.** Which of the following sets of quantum numbers is impossible arrangement?
 (a) $n = 3, m = -2, s = +\frac{1}{2}$
 (b) $n = 4, m = 3, s = +\frac{1}{2}$
 (c) $n = 5, m = 2, s = -\frac{1}{2}$
 (d) $n = 3, m = -3, s = -\frac{1}{2}$
- 23.** The formation of oxide ion $\text{O}^{2-}(\text{g})$ require first an exothermic and then an endothermic step as shown below :

$$\text{O}(\text{g}) + \text{e}^{-} \rightarrow \text{O}^{-}(\text{g}); \Delta H^{\circ} = -142 \text{ kJ mol}^{-1}$$

$$\text{O}^{-}(\text{g}) + \text{e}^{-} \rightarrow \text{O}^{2-}(\text{g}); \Delta H^{\circ} = 844 \text{ kJ mol}^{-1}$$
 This is because
 (a) Oxygen is more electronegative
 (b) O^{-} ion has comparatively larger size than oxygen atom
 (c) O^{-} ion will tend to resist the addition of another electron
 (d) Oxygen has high electron affinity
- 24.** In the standardization of $\text{Na}_2\text{S}_2\text{O}_3$ using $\text{K}_2\text{Cr}_2\text{O}_7$ by iodometry, the equivalent weight of $\text{K}_2\text{Cr}_2\text{O}_7$ is
 (a) molecular weight/2
 (b) molecular weight/6
 (c) molecular weight/3
 (d) same as molecular weight
- 25.** The coordination number of central metal atom in a complex is determined by
 (a) the number of ligands around a metal ion bonded by sigma bonds
 (b) the number of ligands around a metal ion bonded by π bonds
 (c) the number of ligands around a metal ion bonded by sigma and π bonds both
 (d) None of the above
- 26.** Ethylene diamine is an example of
 (a) monodentate ligand (b) bidentate ligand
 (c) tridentate ligand (d) polydentate ligand
- 27.** Deviation from the ideal gas behaviour of a gas can be expressed as
 (a) $Z = \frac{p}{VRT}$ (b) $Z = \frac{pV}{nRT}$
 (c) $Z = \frac{nRT}{pV}$ (d) $Z = \frac{VR}{pT}$
- 28.** To a 4 L of 0.2 M solution of NaOH 2 L of 0.5 M NaOH are added. The molarity of resulting solution is
 (a) 0.9 M (b) 0.3 M
 (c) 1.8 M (d) 0.18 M
- 29.** Reimer-Tiemann reaction involves
 (a) carbonium ion intermediate
 (b) carbene intermediate
 (c) carbanion intermediate
 (d) free radical intermediate
- 30.** Aldol condensation will not observed in
 (a) chloral
 (b) phenylacetaldehyde
 (c) nitroethanal
 (d) hexanal
- 31.** The entropy change for the fusion of 1 mol of a solid which melts at 27°C is (latent heat of fusion = 600 cal mol^{-1})
 (a) 2 cal K^{-1} (b) 22.2 cal K^{-1}
 (c) 180 k cal K (d) $0.5 \text{ cal}^{-1} \text{ K}$

- 32.** The solubility product of $\text{Al}_2(\text{SO}_4)_3$ is given by the expression
 (a) $[\text{Al}^{3+}][\text{SO}_4^{2-}]$ (b) $[\text{Al}^{3+}]^2[\text{SO}_4^{2-}]$
 (c) $[\text{Al}^{3+}]^3[\text{SO}_4^{2-}]^2$ (d) $[\text{Al}^{3+}]^2[\text{SO}_4^{2-}]^3$
- 33.** $\text{S}_{\text{N}}1$ reactions are favoured by
 (a) non-polar solvents
 (b) bulky groups on the carbon atom attached to the halogen atom
 (c) small groups on carbon atom attached to the halogen atom
 (d) None of the above
- 34.** The order of relative bond strength of oxygen molecule, superoxide ion and peroxide ion is
 (a) $\text{O}_2 < \text{O}_2^- < \text{O}_2^{2-}$ (b) $\text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$
 (c) $\text{O}_2 < \text{O}_2^- > \text{O}_2^{2-}$ (d) $\text{O}_2 > \text{O}_2^- < \text{O}_2^{2-}$
- 35.** 1.2 g of Mg (at. mass 24) will produce MgO equal to
 (a) 0.05 mol (b) 40 g (c) 40 mg (d) 4 g
- 36.** The enthalpy change for the transition of liquid water to steam is 40.8 kJ mol^{-1} at 373 K. Calculate the entropy of vaporisation of water.
 (a) $109.4 \text{ JK}^{-1} \text{ mol}^{-1}$ (b) $10.94 \text{ JK}^{-1} \text{ mol}^{-1}$
 (c) $1.094 \text{ JK}^{-1} \text{ mol}^{-1}$ (d) $1009.4 \text{ JK}^{-1} \text{ mol}^{-1}$
- 37.** The function of AlCl_3 in the Friedel-Craft's reaction is
 (a) to absorb water
 (b) to absorb HCl
 (c) to produce electrophile
 (d) to produce nucleophile
- 38.** Which of the following is paramagnetic ?
 (a) O_2 (b) N_2 (c) O_2^{2-} (d) H_2
- 39.** The number of stereoisomers for pent-3-en-2-ol is
 (a) 2 (b) 4 (c) 3 (d) 5
- 40.** When attraction between $A - B$ is more than that of $A - A$ and $B - B$, the solution will show
 (a) positive deviation from Raoult's law
 (b) negative deviation from Raoult's law
 (c) no deviation from Raoult's law
 (d) Cannot be predicted
- 41.** The noble gas used for treatment of cancer is
 (a) Helium (b) Argon
 (c) Radon (d) Krypton
- 42.** Among the following species, which has zero bond order ?
 (a) H_2 (b) H_2^+
 (c) He_2 (d) He_2^+
- 43.** 0.16 g of dibasic acid requires 25 mL decimolar NaOH solution for complete neutralisation. The molecular mass of the acid is
 (a) 256 (b) 64
 (c) 32 (d) 128
- 44.** The standard free energy change (ΔG°) is related to equilibrium constant (K) as
 (a) $\Delta G^\circ = -2.303 RT \ln K$
 (b) $\Delta G^\circ = 2.303 RT \log K$
 (c) $\Delta G^\circ = RT \log K$
 (d) $\Delta G^\circ = -2.303 RT \log K$
- 45.** Degree of dissociation of an acid HCl is 95%. 0.192 g of the acid is present in 0.5 L of solution. The pH of the solution is
 (a) 2 (b) 1
 (c) 3 (d) 4
- 46.** Molisch test is given by
 (a) all carbohydrates (b) sucrose
 (c) fructose (d) glucose
- 47.** The number of amino acids in insulin is
 (a) 21 (b) 574 (c) 51 (d) 5733
- 48.** Low spin complexes are generally formed by elements of
 (a) 3d series (b) 4d series
 (c) 5d series (d) Both (b) and (c)
- 49.** An optically active alkene with the M.F. C_6H_{12} which upon hydrogenation gives optically inactive alkane is
 (a) 2-hexene (b) 3-methyl-2-pentene
 (c) 2-methyl-2-pentene (d) 3-methyl-1-pentene
- 50.** If uncertainty in position and velocity are equal, then uncertainty in momentum will be
 (a) $\frac{1}{2} \sqrt{\frac{mh}{\pi}}$ (b) $\frac{1}{2} \sqrt{\frac{h}{\pi m}}$
 (c) $\frac{h}{4\pi m}$ (d) $\frac{mh}{4\pi}$

Mathematics

1. The equation $3^{3x+4} = 9^{2x-2}$, $x > 0$ has the solution
 - (a) $\frac{7}{8}$
 - (b) $\frac{8}{7}$
 - (c) $\frac{-3}{4}$
 - (d) None of these
2. A parallelogram is constructed on the vectors $\mathbf{a} = 3\alpha - \beta$, $\mathbf{b} = \alpha + 3\beta$. If $|\alpha| = |\beta| = 2$ and the angle between α and β is $\frac{\pi}{3}$, then length of a diagonal of the parallelogram is
 - (a) $4\sqrt{3}$
 - (b) $4\sqrt{5}$
 - (c) $4\sqrt{7}$
 - (d) None of these
3. Every group of order 7 is
 - (a) not abelian
 - (b) not cyclic
 - (c) cyclic
 - (d) None of these
4. Let $U_n = 2 + 2^3 + 2^5 + \dots + 2^{2n+1}$ and $V_n = 1 + 4 + 4^2 + \dots + 4^{n-1}$. Then, $\lim_{n \rightarrow \infty} \frac{U_n}{V_n}$ is equal to
 - (a) 8
 - (b) 6
 - (c) $\frac{3}{4}$
 - (d) $\frac{3}{2}$
5. If $P(n) : 1 + 3 + 5 + \dots + (2n-1) = n^2$ is
 - (a) true for all $n \in \mathbb{N}$
 - (b) true for $n > 1$
 - (c) true for no n
 - (d) None of these
6. The minimum value of $x^2 + \frac{1}{1+x^2}$ is, at
 - (a) $x = 0$
 - (b) $x = 1$
 - (c) $x = 4$
 - (d) $x = 3$
7. The coefficient of x^{-9} in the expansion of $\left(\frac{x^2}{2} - \frac{2}{x}\right)^9$ is
 - (a) 512
 - (b) -512
 - (c) 521
 - (d) 251
8. The sum to n terms of the series $\frac{1}{2} + \frac{3}{4} + \frac{7}{8} + \frac{15}{16} + \dots$ is
 - (a) $2^n - 1$
 - (b) $1 - 2^n$
 - (c) $n + 2^n - 1$
 - (d) $n - 1 + 2^{-n}$
9. The value of $\begin{vmatrix} a & a+b & a+2b \\ a+2b & a & a+b \\ a+b & a+2b & a \end{vmatrix}$ is equal to
 - (a) $9a^2(a+b)$
 - (b) $9b^2(a+b)$
 - (c) $a^2(a+b)$
 - (d) $b^2(a+b)$
10. The negation of the compound proposition $p \vee (\sim p \vee q)$ is
 - (a) $(p \wedge \sim q) \wedge \sim p$
 - (b) $(p \wedge \sim q) \vee \sim p$
 - (c) $(p \wedge \sim q) \vee \sim p$
 - (d) None of the above
11. In the group $[G = \{0, 1, 2, 3, 4\}, \times_5]$ the inverse of (2×2^{-1}) is
 - (a) 0
 - (b) 1
 - (c) 2
 - (d) 3
12. The statement $P(n) = 9^n - 8^n$, when divided 8, always leaves the remainder
 - (a) 1
 - (b) 2
 - (c) 3
 - (d) 7
13. If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \pi$, then $x + y + z$ is
 - (a) xyz
 - (b) 0
 - (c) 1
 - (d) $2xyz$
14. If $\left(\frac{1}{2}, \frac{1}{3}, n\right)$ are the direction cosines of a line, then the value of n is
 - (a) $\frac{\sqrt{23}}{6}$
 - (b) $\frac{23}{36}$
 - (c) $\frac{2}{3}$
 - (d) $\frac{3}{2}$
15. Derivative of x^x is
 - (a) $x^x(1 - \log x)$
 - (b) $1 + \log x$
 - (c) $x^x(1 + \log x)$
 - (d) $1 - \log x$
16. If $(3 - x) \equiv (2x - 5) \pmod{4}$, then one of the values of x is
 - (a) 3
 - (b) 4
 - (c) 18
 - (d) 5
17. The product of the perpendicular from $(-1, 2)$ to the pair of lines $2x^2 - 5xy + 2y^2 + 3x - 3y + 1 = 0$ is
 - (a) $\frac{5}{12}$
 - (b) $\frac{12}{5}$
 - (c) $\frac{6}{5}$
 - (d) $\frac{5}{6}$

- 18.** If $\mathbf{a} = -\hat{\mathbf{i}} + 2\hat{\mathbf{j}} - \hat{\mathbf{k}}$, $\mathbf{b} = \hat{\mathbf{i}} + \hat{\mathbf{j}} - 3\hat{\mathbf{k}}$ and $\mathbf{c} = -4\hat{\mathbf{i}} - \hat{\mathbf{k}}$, then $\mathbf{a} \times (\mathbf{b} \times \mathbf{c}) + (\mathbf{a} \cdot \mathbf{b}) \mathbf{c}$
- (a) $5\hat{\mathbf{i}} + 5\hat{\mathbf{j}} - 15\hat{\mathbf{k}}$ (b) $\mathbf{0}$
 (c) $12\hat{\mathbf{j}} + 4\hat{\mathbf{k}}$ (d) $-3\hat{\mathbf{i}} + 6\hat{\mathbf{j}} - 3\hat{\mathbf{k}}$
- 19.** The work done by the force $4\hat{\mathbf{i}} - 3\hat{\mathbf{j}} + 2\hat{\mathbf{k}}$ in moving a particle along a straight line from the point $(3, 2, -1)$ to $(2, -1, 4)$ is
- (a) 0 unit (b) 4 unit (c) 15 unit (d) 19 unit
- 20.** The value of 'a' for which the function $f(x) = a \sin x + \left(\frac{1}{3}\right) \sin 3x$ has an extremum at $x = \frac{\pi}{3}$, is
- (a) 1 (b) -1 (c) 2 (d) 0
- 21.** If $|f(x)|$ is continuous at $x = a$, then $f(x)$ is
- (a) continuous at $x = a$
 (b) continuous at $x = -a$
 (c) continuous at $x = \sqrt{a}$
 (d) not be continuous at $x = a$
- 22.** The general solution of $x(1 + y^2)^{1/2} dx + y(1 + x^2)^{1/2} dy = 0$ is
- (a) $\sin^{-1} x + \sin^{-1} y = c$
 (b) $x^2 + y^2 = (1 + x^2)^{1/2} + (1 + y^2)^{1/2} + c$
 (c) $(1 + x^2)^{1/2} + (1 + y^2)^{1/2} = c$
 (d) $\tan^{-1} x - \tan^{-1} y = c$
- 23.** The area in square unit enclosed by the curve $x^2 y = 36$, the x -axis and the lines $x = 6$ and $x = 9$ is
- (a) 2 sq unit (b) 1 sq unit
 (c) 4 sq unit (d) 3 sq unit
- 24.** $\int_0^{\frac{\pi}{2}} \frac{\sin^n \theta}{\sin^n \theta + \cos^n \theta} d\theta$ is equal to
- (a) 1 (b) 0
 (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{4}$
- 25.** Area of the triangle in the argand diagram formed by the complex numbers $z, iz, z + iz$, where $z = x + iy$ is
- (a) $|z|$ (b) $|z|^2$
 (c) $2|z|^2$ (d) $\frac{1}{2}|z|^2$
- 26.** If $f(x) = \frac{\log(1 + ax) - \log(1 - bx)}{x}$ for $x \neq 0$ and $f(0) = k$ and $f(x)$ is continuous at $x = 0$, then k is equal to
- (a) $a + b$ (b) $a - b$ (c) a (d) b
- 27.** The least positive remainder when $123 \times 125 \times 127$ is divided by 124 is
- (a) 4 (b) 120 (c) 121 (d) 130
- 28.** By eliminating the arbitrary constants A and B from $y = Ax^2 + Bx$, we get the differential equation
- (a) $\frac{d^3 y}{dx^3} = 0$ (b) $x^2 \frac{d^2 y}{dx^2} - 2x \frac{dy}{dx} + 2y = 0$
 (c) $\frac{d^2 y}{dx^2} = 0$ (d) $x^2 \frac{d^2 y}{dx^2} + y = 0$
- 29.** The equation $(\cos p - 1)x^2 + \cos px + \sin p = 0$ in the variable x , has real roots. Then, p can take any value in the interval
- (a) $(0, \pi)$ (b) $(-\pi, 0)$
 (c) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ (d) $(-\pi, \pi)$
- 30.** If $3 \sin^{-1} \left(\frac{2x}{1+x^2} \right) - 4 \cos^{-1} \left(\frac{1-x^2}{1+x^2} \right) + 2 \tan^{-1} \left(\frac{2x}{1-x^2} \right) = \frac{\pi}{3}$, then x is equal to
- (a) $\frac{1}{\sqrt{3}}$ (b) $-\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $-\frac{\sqrt{3}}{2}$
- 31.** If $\sin(\pi \cos \theta) = \cos(\pi \sin \theta)$, then which of the following is correct?
- (a) $\cos \theta = \frac{3}{2\sqrt{2}}$
 (b) $\cos \left(\theta - \frac{\pi}{2} \right) = \frac{1}{2\sqrt{2}}$
 (c) $\cos \left(\theta - \frac{\pi}{4} \right) = \frac{1}{2\sqrt{2}}$
 (d) $\cos \left(\theta + \frac{\pi}{4} \right) = -\frac{1}{2\sqrt{2}}$
- 32.** If $f(x) = \begin{cases} x+1, & x \leq 1 \\ 3-ax^2, & x > 1 \end{cases}$ is continuous at $x = 1$, then the value of a is
- (a) 1 (b) 2
 (c) -3 (d) -2

- 33.** The area bounded by $y = 1 + \frac{8}{x^2}$ and the ordinates $x = 2$ and $x = 4$ is
 (a) 2 sq unit (b) 4 sq unit
 (c) log 2 sq unit (d) log 4 sq unit
- 34.** Everybody in a room shakes hands with everybody else. The total number of handshakes is 66. The number of persons in the room is
 (a) 11 (b) 12 (c) 13 (d) 14
- 35.** The condition that one root of the equation $ax^2 + bx + c = 0$ may be square of the other, is
 (a) $a^2c + ac^2 + b^3 - 3abc = 0$
 (b) $a^2c^2 + ac^2 + b^2 - 3abc = 0$
 (c) $ac^2 + ac - b^3 - 3abc = 0$
 (d) $a^2c + ac^2 - b^3 - 3abc = 0$
- 36.** The value of $\sum_{r=1}^{\infty} [3 \cdot 2^{-r} - 2 \cdot 3^{1-r}]$ is
 (a) 2 (b) $1/2$ (c) 1 (d) 0
- 37.** If $x(1+y^2)dx + y(1+x^2)dy = 0$ and $y(0) = 1$, then $x^2y^2 + x^2 + y^2$ is equal to
 (a) 0 (b) 1 (c) 2 (d) 3
- 38.** If $f(x) = \frac{x + \cos x}{x - \cos x}$, $f'\left(\frac{\pi}{2}\right)$ is equal to
 (a) $\frac{2(x \sin x + \cos x)}{(x - \cos x)^2}$ (b) $\frac{2(x \cos x + \sin x)}{(x - \cos x)^2}$
 (c) $\frac{-2(x \sin x + \cos x)}{(x + \cos x)^2}$ (d) None of these
- 39.** If $A(-1, 2)$, $B(5, 1)$, $C(6, 5)$ are the vertices of a parallelogram $ABCD$. The equation to the diagonal through B is
 (a) $x + y + 6 = 0$ (b) $x + y - 6 = 0$
 (c) $x - y - 4 = 0$ (d) $x - 2y - 1 = 0$
- 40.** $\int_0^1 x \sin \pi x dx$ is equal to
 (a) 1 (b) $1/2$ (c) π (d) $1/\pi$
- 41.** If a, b, c are different integers such that $(a, b) = c$, which of the following statements is true?
 (a) $\frac{a}{c}$ (b) $\frac{c}{b}$
 (c) $\frac{b}{a}$ (d) None of these
- 42.** If a, b and c are negative and different real numbers, then $\Delta = \begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ is
 (a) < 0 (b) 0 (c) > 0 (d) ≤ 0
- 43.** The product of ' n ' positive numbers is unity. Then, their sum is
 (a) a positive integer (b) divisible by n
 (c) equal to $n + \frac{1}{n}$ (d) never less than n
- 44.** The function $\sin x (1 + \cos x)$, $0 \leq x \leq \frac{\pi}{2}$ has maximum value, when x is equal to
 (a) 0 (b) $\frac{\pi}{2}$
 (c) $\frac{\pi}{6}$ (d) None of these
- 45.** Differential equations of the family of curves $y = a \cos \mu x + b \sin \mu x$, where a and b are arbitrary constants is given by
 (a) $\frac{d^2y}{dx^2} + \mu y = 0$ (b) $\frac{d^2y}{dx^2} - \mu^2 y = 0$
 (c) $\frac{d^2y}{dx^2} + \mu^2 y = 0$ (d) None of these
- 46.** The area included between the curves $y^2 = 2x$ and $x^2 = 2y$ is
 (a) $\frac{3}{4}$ sq unit (b) $\frac{4}{3}$ sq unit
 (c) $\frac{1}{2}$ sq unit (d) $\frac{4}{3}$ sq unit
- 47.** If $A \cdot \text{adj}(A) = O$, then $|A|$ is
 (a) 0 (b) $\frac{1}{|\text{adj } A|}$ (c) 1 (d) -1
- 48.** If $|\mathbf{a} + \mathbf{b}| = |\mathbf{a} - \mathbf{b}|$, then $\mathbf{a}$ and $\mathbf{b}$ are
 (a) parallel
 (b) perpendicular
 (c) angle between $\mathbf{a}$ and $\mathbf{b}$ is 45°
 (d) angle between $\mathbf{a}$ and $\mathbf{b}$ is 60°
- 49.** $\lim_{x \rightarrow 0} \left(\frac{(2+x) \sin(2+x) - 2 \sin 2}{x} \right)$ is equal to
 (a) $\sin 2$ (b) $\cos 2$
 (c) 1 (d) $2 \cos 2 + \sin 2$

50. $\int \frac{2dx}{(e^x + e^{-x})^2}$ is equal to

- (a) $-\frac{e^{-x}}{(e^x + e^{-x})} + c$ (b) $-\frac{1}{(e^x + e^{-x})} + c$
 (c) $\frac{1}{(e^x + 1)^2} + c$ (d) $\frac{1}{(e^x - e^{-x})^2} + c$

51. If the rate of change in the circumference of a circle of 0.3 cm/s, then the rate of change in the area of the circle when the radius is 5 cm, is

- (a) 1.5 sq cm/s (b) 0.5 sq cm/s
 (c) 5 sq cm/s (d) 3 sq cm/s

52. If ω is a cube root of unity, then $(1 + \omega - \omega^2)(1 - \omega + \omega^2)$ is

- (a) 1 (b) 0 (c) 2 (d) 4

53. The complex number z which satisfy the equation $\left| \frac{i+z}{i-z} \right| = 1$ lies on

- (a) a circle $x^2 + y^2 = 1$ (b) the x-axis
 (c) the y-axis (d) the line $x + y = 1$

54. If $A + B + C = \pi$, then

- $\begin{vmatrix} \sin(A+B+C) & \sin B & \cos C \\ -\sin B & 0 & \tan A \\ \cos(A+B) & -\tan A & 0 \end{vmatrix}$ is equal to
 (a) $\sin A$ (b) $\sin A \cos B$
 (c) 0 (d) None of these

55. The minimum value of $x \log x$ is equal to

- (a) e (b) $1/e$ (c) $-1/e$ (d) $2/e$

56. If $f''(0) = k$, then

$\lim_{x \rightarrow 0} \frac{2f(x) - 3f(2x) + f(4x)}{x^2}$ is equal to

- (a) k (b) $2k$ (c) $3k$ (d) $4k$

57. If $\int_{-1}^4 f(x) dx = 4$ and $\int_2^4 [3 - f(x)] dx = 7$, then

the value of $\int_{-1}^2 f(x) dx$ is

- (a) -2 (b) 3 (c) 5 (d) 8

58. The equation of a curve passing through the origin and satisfying the differential equation $\frac{dy}{dx} = (x - y)^2$ is

- (a) $e^{2x}(1 - x + y) = 1 + x - y$
 (b) $e^{2x}(1 + x - y) = 1 - x + y$
 (c) $e^{2x}(1 - x + y) + (1 + x - y) = 0$
 (d) $e^{2x}(1 + x + y) = 1 - x + y$

59. If $(\sqrt{3} - i)^{50} = 2^{48}(x - iy)$, then $x^2 + y^2$ is equal to

- (a) 2 (b) 4 (c) 8 (d) 16

60. If the coefficients of the r th term and the $(r+1)$ th term in the expansion of $(1+x)^{20}$ are in the ratio 1 : 2, then r is equal to

- (a) 6 (b) 7 (c) 8 (d) 9

61. The area of a parallelogram with diagonals as

$\mathbf{a} = 3\hat{i} + \hat{j} - 2\hat{k}$ and $\mathbf{b} = \hat{i} - 3\hat{j} + 4\hat{k}$ is

- (a) $10\sqrt{3}$ (b) $\frac{10}{\sqrt{3}}$
 (c) $5\sqrt{3}$ (d) $\frac{5}{\sqrt{3}}$

62. The sum of infinite terms of the geometric progression $\frac{\sqrt{2}+1}{\sqrt{2}-1}, \frac{1}{2-\sqrt{2}}, \frac{1}{2}, \dots$ is

- (a) $\sqrt{2}(\sqrt{2}+1)^2$ (b) $(\sqrt{2}+1)^2$
 (c) $5\sqrt{2}$ (d) $3\sqrt{2} + \sqrt{5}$

63. The first three terms in the expansion of $(1+ax)^n$ ($n \neq 0$) are 1, $6x$ and $16x^2$. Then, the values of a and n are respectively

- (a) 2 and 9 (b) 3 and 2
 (c) $\frac{2}{3}$ and 9 (d) $\frac{3}{2}$ and 6

64. If $f(x) = \begin{cases} x^2 - 9, & \text{if } x \neq 3 \\ 2x + k, & \text{otherwise} \end{cases}$ is continuous at

$x = 3$, then k is equal to

- (a) 3 (b) 0
 (c) -6 (d) $\frac{1}{6}$

65. The area of the region

$\{(x, y) : x^2 + y^2 \leq 1 \leq x + y\}$ is

- (a) $\frac{\pi^2}{5}$ sq unit (b) $\frac{\pi^2}{2}$ sq unit
 (c) $\left(\frac{\pi}{4} - \frac{1}{2}\right)$ sq unit (d) $\frac{\pi}{4}$ sq unit

66. $\left| \frac{x}{2} - 1 \right| < 3$ implies that x lies in the interval

- (a) $(-4, 8)$ (b) $(-3, 6)$
 (c) $(-4, 6)$ (d) $(-3, 8)$

67. $\sin^{-1} \frac{1}{\sqrt{5}} + \cos^{-1} \frac{3}{\sqrt{10}}$ is equal to

- (a) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $2\pi/3$

68. If $f(x) = \sec x - \cot x$, then $f'\left(\frac{\pi}{6}\right)$ is equal to

- (a) -3 (b) $\frac{14}{3}$ (c) $\frac{11}{3}$ (d) 5

69. If $\mathbf{a}$, $\mathbf{b}$, $\mathbf{c}$ are the position vectors of A , B , C

respectively such that $3\mathbf{a} + 4\mathbf{b} - 7\mathbf{c} = \mathbf{0}$, then C divides AB in the ratio

- (a) $4 : 3$ (b) $4 : 7$
 (c) $3 : 7$ (d) $3 : 4$

70. If $\begin{bmatrix} a & 2 & 3 \\ b & 5 & -1 \end{bmatrix} \times \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ -1 & 1 \end{bmatrix} = \begin{bmatrix} 4 & 13 \\ 12 & 11 \end{bmatrix}$, (a, b) is

- (a) $(1, -2)$ (b) $(-1, -4)$
 (c) $(1, 3)$ (d) $(1, -4)$

English & General Aptitude

Directions (Q. 1–5): Read the following passage carefully and answer the questions given below it.

After submitting his resignation, Albert came out and took the long narrow road leading to the railway station which was one of the busiest roads in the city. Sad and depressed and worried about looking for a new job. Albert looked around for a cigarette shop. He walked up to the end of the road but found no tobacconist. It was odd that such a busy thoroughfare with thousands of people passing through did not even have a single cigarette shop. He suddenly felt that it was no longer necessary for him to hunt for a job. He decided to open a tobacco shop himself. It was bound to be profitable, he felt.

1. After submitting his resignation, Albert came out worried about
 - (a) a shelter (b) cigarettes
 - (c) a job (d) the next available train
2. Albert was sad and depressed because
 - (a) he had no money for the train journey
 - (b) he had to walk on a long road
 - (c) he was not able to buy cigarettes
 - (d) he was worried about finding a job
3. There was no cigarette shop on that road because
 - (a) smoking was banned in that area
 - (b) just by chance nobody had opened one on that road
 - (c) it was a very narrow road
 - (d) cigarette-shop owners do not make any profit

4. Albert decided not to look for a new job because

- (a) the thought of having to look for a job greatly distressed him
- (b) he did not want to work at all
- (c) there was no hope of finding a job
- (d) he saw the possibility of self-employment

5. A cigarette shop on a busy road was bound to be profitable because

- (a) cigarette shops are known to make a great deal of profit
- (b) any shop on a busy street would attract a large number of customers
- (c) cigarettes are inexpensive items and people buy them willingly
- (d) a cigarette shop on a busy road would attract a large number of customers

Directions (Q. 6–8) In the following passage, there are blanks each of which has been numbered. These numbers are printed below the passage and against each, some words are suggested, one of which fits the blank appropriately. Find the appropriate word for each blank.

Scientific psychology recognises a ...6... truth that no two individuals are...7... in this world even through, equality is a fostered norm of civil society, the truth is that men...8...unequals in varying hues or degrees.

6. (a) clear (b) real (c) simple (d) direct
7. (a) alike (b) close (c) liked (d) equal
8. (a) will (b) are (c) is (d) was

Directions (Q. 9–10): In each of the following questions, choose the alternative which best expresses the meaning of the word given in capital letters.

9. INDIGENOUS

- (a) Normal
- (b) Internal
- (c) Natural
- (d) Native

10. OPULENT

- (a) Greedy
- (b) Hungry
- (c) Heavy
- (d) Wealthy

Directions (Q. 11–12): In each of the following questions, choose the alternative which can be substituted for the given words/sentence.

11. Science of printing

- (a) Calligraphy
- (b) Typography
- (c) Topography
- (d) Cryptography

12. Man whose wife has been unfaithful to him

- (a) Dandy
- (b) Bastard
- (c) Concubine
- (d) Cuckold

Directions (Q. 13–15): In each of the following questions, find out the part which has an error. If there is no error, your answer is (d).

13. We grieve our loss and cry helplessly (a)/ while we should be fighting for our rights (b)/and die a noble death (c)/ No error. (d)

14. Work hard (a) / lest you will (b) / fail (c) / No error. (d)

15. My friend did not see me (a)/ for many years (b)/when I met him last week. (c)/No error. (d)

Directions (Q. 16–25): In the following questions, choose the option which shows common feature in the relationship given in each question.

16. Indira : Nehru : Benazir

- (a) They were Presidents
- (b) They were Prime Ministers
- (c) They were sports persons
- (d) They were Indian politicians

17. Mohinder : Gavaskar : Azaharuddin

- (a) They were Indian Athlets
- (b) They were Indian foreign ministers
- (c) They were cicket umpires
- (d) They are former Indian cricketers

18. Folketing : Stortling : Kneset

- (a) They are the name of currencies
- (b) They are the name of rivers
- (c) They are the name of Parliaments
- (d) They are the name of cities

19. Car : Bike : Bus

- (a) They are accelerator
- (b) They are mode of transport
- (c) They have wheels
- (d) They are run by a person

20. Irna : PTI : Xin-Era

- (a) They are newspapers
- (b) They are computer manufacturing companies
- (c) They are news agencies
- (d) They are publishing houses

21. Pitcher : Dusra : Bunker

- (a) They are parliament's name
- (b) They are dwelling places of animals
- (c) They are sports terms
- (d) They are terms related to cricket

22. Mamb : Krait : Viper

- (a) They are insects
- (b) They are haunting spirits
- (c) These are boot polishes
- (d) These are snakes

23. Metre : Mile : Kilometre

- (a) They are units of electricity
- (b) They are units of measuring anything
- (c) They are units of distance
- (d) They are units of weight

24. Crocodile : Whale : Hippopotamus

- (a) They are animals
- (b) They are domestic animals
- (c) They are land animals
- (d) They are water animals

25. Knot : Watt : Fathom

- (a) The terms are used by sailors
- (b) The terms are used for installing electricity
- (c) The terms are connected with rope
- (d) They are units of measurement

- 26.** At which place has the Central Government decided to set up a sector specific SEZ in biotechnology ?
- (a) Bengaluru (b) Hyderabad
(c) New Delhi (d) Cuttack
- 27.** What is 'NSG'?
- (a) National Service of Government
(b) Nuclear Supplier Group
(c) Non-Nuclear Supplier Group
(d) Non-Secular Group
- 28.** Which is the tallest structure in the world ?
- (a) Taipei Towers (b) Eiffel Tower
(c) Burj Dubai (d) Patronos Tower
- 29.** Name the Country with which India has agreed to deepen security cooperation, bilaterally and in the multilateral fora, and strengthen terrorism in all its form and maifestations.
- (a) France (b) Canada
(c) Russia (d) Nepal
- 30.** Nepal Electricity Authority (NEA) has signed a joint venture agreement with CTGC to construct 750 MW west seti hydropower project. CTGC is a/an
- (a) India company (b) Chinese company
(c) Russian company (d) American company