AIPMT - 2001

Q.1 The dimension of Planck constant equals to that of :

(1) Energy (2) Momentum

(3) Angular momentum (4) Power

Q.2 Following truth table represent which logic gate –

A	B	C
1	1	0
0	1	1
1	0	1
0	0	1

(1) XOR (2) NOT

(3) NAND (4) AND

Q.3 Which rays contain (+ Ve) charged particle : -

(1) α-rays (2) β-rays

(3) γ-rays (4) X-rays

Q.4 An electron having mass 'm' and kinetic energy E enter in uniform magnetic field B perpendicularly, then its frequency will be : -

(1) $\frac{eE}{qVB}$ (2) $\frac{2\pi m}{eB}$

(3) $\frac{eB}{2\pi m}$ (4) $\frac{2m}{eBE}$

Q.5 A particle is thrown vertically upward. Its velocity at half of the height is 10 m/s. Then the maximum height attained by it : -

($g = 10\ m/s^2$)

(1) 8 m (2) 20 m (3) 10 m (4) 16 m

Q.6 A particle is projected making angle 45° with horizontal having kinetic energy K. The kinetic energy at highest point will be : -

(1) $\frac{K}{\sqrt{2}}$ (2) $\frac{K}{2}$ (3) 2K (4) K

Q.7 A black body has wavelength λ_m corresponding to maximum energy at 2000 K. Its wavelength corresponding to maximum energy at 3000 K will be : -

(1) $\frac{3}{2}\lambda_m$ (2) $\frac{2}{3}\lambda_m$

(3) $\frac{16}{81}\lambda_m$ (4) $\frac{81}{16}\lambda_m$

Q.8 Two particles having mass 'M' and 'm' are moving in a circular path having radius R & r respectively. If their time period are same then the ratio of angular velocity will be : -

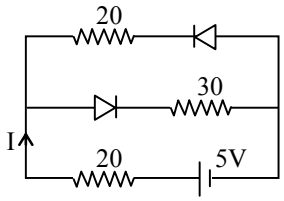
(1) $\frac{r}{R}$ (2) $\frac{R}{r}$ (3) 1 (4) $\sqrt{\frac{R}{r}}$

Q.9 A child is sitting on a swing. Its minimum and maximum heights from the ground is 0.75 m and 2 m respectively, its maximum speed will be

(1) 10 m/s (2) 5 m/s

(3) 8 m/s (4) 15 m/s

Q.10 The current (I) in the circuit will be : -



(1) $\frac{5}{40}$A (2) $\frac{5}{50}$A (3) $\frac{5}{10}$A (4) $\frac{5}{20}$A

Q.11 Biological importance of Ozone layer is : -

(1) It stops ultraviolet rays

(2) Ozone layer reduces green house effect

(3) Ozone layer reflects radio waves

(4) Ozone layer controls O_2/H_2 ratio in atmosphere

Q.12 Two springs A and B having spring constant K_A and K_B. ($K_A = 2K_B$) are stretched by applying force of equal magnitude. If energy stored in spring A is E then energy stored in B will be : -

(1) 2E (2) $\frac{E}{4}$ (3) $\frac{E}{2}$ (4) 4E

Q.13 A charge Q μc is placed at the centre of cube, the flux coming out from any surfaces will be : -

(1) $\frac{Q}{6\varepsilon_0} \times 10^{-6}$ (2) $\frac{Q}{6\varepsilon_0} \times 10^{-3}$

(3) $\frac{Q}{2\varepsilon_0}$ (4) $\frac{Q}{8\varepsilon_0}$

Q.14 X(n, α) $^{7}_{3}Li$, then X will be : -

(1) $^{10}_{5}B$ (2) $^{9}_{5}B$ (3) $^{11}_{4}Be$ (4) $^{4}_{2}He$

Q.15 Half life of radioactive element is 12.5 Hour and its quantity is 256 gm. After how much time its quantity will remain 1 gm : -

(1) 50 Hrs (2) 100 Hrs

(3) 150 Hrs (4) 200 Hrs

Q.16 A scientist says that the efficiency of his heat engine which work at source temperature 127ºC and sink temperature 27º C to 26%, then

(1) It is impossible

(2) It is possible but less probable

(3) It is quite probable

(4) Data are incomplete

Q.17 A cricketer catches a ball of mass 150 gm. in 0.1 second moving with speed 20 ms^{-1}. Then he experiences force of : -

(1) 300 N (2) 30 N (3) 3 N (4) 0.3 N

Q.18 If the tension and diameter of a sonometer wire of fundamental frequency n is doubled and density is halved then its fundamental frequency will become

(1) $\frac{n}{4}$ (2) $\sqrt{2}\,n$ (3) n (4) $\frac{n}{\sqrt{2}}$

Q.19 The total energy of particle performing SHM depend on : -

(1) K, a, m (2) K, a

(3) K, a, x (4) K, x

Q.20 With what velocity should a particle be projected so that its height becomes equal to radius of earth -

(1) $\left(\frac{GM}{R}\right)^{1/2}$ (2) $\left(\frac{8GM}{R}\right)^{1/2}$

(3) $\left(\frac{2GM}{R}\right)^{1/2}$ (4) $\left(\frac{4GM}{R}\right)^{1/2}$

Q.21 A disc is placed on a surface of pond which has refractive index $\frac{5}{3}$. A source of light is placed 4 m below the surface of liquid. The minimum radius of disc will be so light is not coming out

(1) ∞ (2) 3m (3) 6m (4) 4m

Q.22 A ray of light travelling in air haves wavelength λ, frequency n, velocity v and intensity I. If this ray enters into water then these parameter are λ', n' , v' and I' respectively. Which relation is correct

(1) $\lambda = \lambda'$ (2) $n = n'$ (3) $v = v'$ (4) $I = I'$

Q.23 A cylindrical rod having temperature T_1 and T_2 at its end. The rate of flow of heat Q_1 cal/sec. If all the linear dimension are doubled keeping temperature remain const. then rate of flow of heat Q_2 will be : -

(1) $4Q_1$ (2) $2Q_1$

(3) $\frac{Q_1}{4}$ (4) $\frac{Q_1}{2}$

Q.24 If $\left|\vec{A}+\vec{B}\right| = \left|\vec{A}\right| = \left|\vec{B}\right|$ then angle between A and B will be : -

(1) 90º (2) 120º (3) 0º (4) 60º

Q.25 Optical fibre are based on : -

(1) Total internal relfection

(2) Less scattering

(3) Refraction

(4) Less absorbtion coefficient

Q.26 Which one among shows particle nature of light.

(1) P.E.E. (2) Interference

(3) Refraction (4) Polirazation

Q.27 Two waves having equation

$x_1 = a \sin(\omega t + \phi_1)$

$x_2 = a \sin(\omega t + \phi_2)$

If in the resultant wave the frequency and amplitude remains equals to amplitude of superimposing waves. Then phase diff. between them : -

(1) $\frac{\pi}{6}$ (2) $\frac{2\pi}{3}$

(3) $\frac{\pi}{4}$ (4) $\frac{\pi}{3}$

Q.28 In Thomson mass spectrograph $\vec{E} \perp \vec{B}$ then the velocity of underflected electron beam will be :

(1) $\frac{|\vec{E}|}{|\vec{B}|}$ (2) $\vec{E} \times \vec{B}$ (3) $\frac{|\vec{B}|}{|\vec{E}|}$ (4) $\frac{E^2}{B^2}$

Q.29 Energy per unit volume for a capacitor having area A and separation d kept at potential diffeence V is given by : -

(1) $\frac{1}{2}\varepsilon_0 \frac{V^2}{d^2}$ (2) $\frac{1}{2\varepsilon_0}\frac{V^2}{d^2}$

(3) $\frac{1}{2}CV^2$ (4) $\frac{Q^2}{2C}$

Q.30 On the horizontal surface of a truck a block of mass 1 kg is placed (μ = 0.6) and truck is moving with acceleration 5 m/s^2 then the frictional force on block will be : -

(1) 5N (2) 6N

(3) 5.88N (4) 8N

Q.31 Tangent galvanometer is used to measure : -

(1) Potential difference

(2) Current

(3) Resistance

(4) In measuring charge

Q.32 A capacitor of capacity C and reactance X if capacitance and frequency become double then reactance will be : -

(1) 4X (2) $\frac{X}{2}$

(3) $\frac{X}{4}$ (4) 2X

Q.33 A disc is rolling the velocity of its centre of mass is V_{cm} then which one will be correct : -

(1) The velocity of highest point is $2V_{cm}$ and point of contact is zero

(2) The velocity of highest point is V_{cm} and point of contact is V_{cm}

(3) The velocity of highest point is $2V_{cm}$ and point of contact is V_{cm}

(4) The velocity of highest point is 2 V_{cm} and point of contact of contact is $2V_{cm}$

Q.34 If specific resistance of a potentiometer wire is $10^{-7}\Omega$m and current flow through it is 0.1 A, cross-sectional area of wire is 10^{-6} m^2 then potential gradient will be : -

(1) 10^{-2} V/m (2) 10^{-4} V/m

(3) 10^{-6} V/m (4) 10^{-8} V/m

Q.35 For a coil having L = 2 mh, current flow through it is $I = t^2 e^{-t}$ then the time at which emf become zero : -

(1) 2 s (2) 1 s

(3) 4 s (4) 3 s

Q.36 For a common emmiter circuit if $\frac{I_C}{I_E}$ = 0.98 then current gain for common emitter circuit will be :-

(1) 49 (2) 98

(3) 4.9 (4) 25.5

Q.37 A dipole of moment $\vec{p}$ is placed in uniform electric field $\vec{E}$ then torque acting on it is given by : -

(1) $\vec{\tau} = \vec{p} . \vec{E}$ (2) $\vec{\tau} = \vec{p} \times \vec{E}$

(3) $\vec{\tau} = \vec{p} + \vec{E}$ (4) $\vec{\tau} = \vec{p} - \vec{E}$

Q.38 If number of turn, area and current through it is given by n, A and i respectively then its magnetic moment will be : -

(1) niA (2) n^2iA

(3) niA^2 (4) $\frac{ni}{\sqrt{A}}$

Q.39 The equation of a wave is represented by : -

$y = 10^{-4} \sin\left(100t - \frac{x}{10}\right)$ m, then the velocity of wave will be : -

(1) 100 m/s (2) 4 m/s

(3) 1000 m/s (4) 0.00 m/s

Q.40 The interplaner distance in a crystal is 2.8×10^{-8} m. The value of maximum wavelength which can be diffracted : -

(1) 2.8×10^{-8} m (2) 5.6×10^{-8} m

(3) 1.4×10^{-8} m (4) 7.6×10^{-8} m

Q.41 The energy of hydrogen atom in n^{th} orbit is E_n then the energy in n^{th} orbit of singly ionised helium atom will be : -

(1) 4 E_n (2) $E_n/4$

(3) $2E_n$ (4) $E_n/2$

Q.42 Among which the magnetic susceptibility does not depend on the temperature : -

(1) Dia-magnetis (2) Paramagnetis

(3) Ferro-magnetism (4) Ferrite

Q.43 The resistance of each arm of the wheat stone bridge is 10 ohm. A resistance of 10 ohm is connected in series with galvanometer then the equivalent resistance across the battery will be :

(1) 10 ohm (2) 15 ohm

(3) 20 ohm (4) 40 ohm

Q.44 Copper and silicon is cooled from 300 K to 60 K, the specific resistance : -

(1) Decrease in copper but increase in silicon

(2) Increase in copper but decrease in silicon

(3) Increase in both

(4) Decrease in both

Q.45 In BCC, the distance between two nearest atoms will be : -

(1) $\sqrt{3}$ a (2) $\frac{\sqrt{3}}{2}$a (3) $\frac{\sqrt{3}}{4}$a (4) $\frac{a}{2}$

Q.46 250 N force is required to raise 75 kg mass from a pulley. If rope is pulled 12 m then the load is lifted to 3m, the efficiency of pulley system will be : -

(1) 25% (2) 33.3%

(3) 75% (4) 90%

Q.47 A photo-cell is illuminated by a source of light, which is placed at a distance d from the cell. If the distance become d/2, then number of electrons emited per second will be : -

(1) Remain same (2) Four times

(3) Two times (4) One-fourth

Q.48 M_n and M_p represet the mass of neutron and proton respectively. An element having mass M has N neutron and Z-protons, then the correct relation will be : -

(1) $M < \{N.M_n + Z.M_p\}$ (2) $M > \{N.M_n + Z.M_p\}$

(3) $M = \{N.M_n + Z.M_p\}$ (4) $M = N\{M_n + M_p\}$

Q.49 A 1 kg stationary bomb is exploded in three parts having mass 1 : 1 : 3 respectively. Parts having same mass move in perpendicular direction with velocity 30 ms^{-1}, then the velocity of bigger part will be : -

(1) 10 $\sqrt{2}$ ms^{-1} (2) $\frac{10}{\sqrt{2}} ms^{-1}$

(3) $15\sqrt{2}$ ms^{-1} (4) $\frac{15}{\sqrt{2}} ms^{-1}$

Q.50 Energy is released in nuclear fission is due to

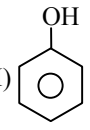
(1) Few mass is converted into energy

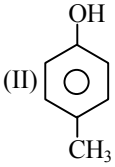
(2) Total binding energy of fragements is more than the B.E. of parantel element

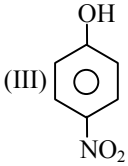
(3) Total B.E. of fragements is less than the B.E. of parantel element

(4) Total B.E. of fragements is equals to the B.E. of parantal element is

Q.51 The correct acidic order of following is : -

(I) 

(II) 

(III) 

(1) I > II > III (2) III > I > II

(3) II > III > I (4) I > III > II

Q.52 $CH_3–CH_2–\underset{\underset{Cl}{|}}{CH}–CH_3$ obtained by chlorination of n-butane, will be : -

(1) Meso form (2) Racemic mixture

(3) d-form (4) ℓ-form

Q.53 Which alkeneon ozonolysis gives CH_3CH_2CHO and $CH_3\overset{\overset{O}{||}}{C}CH_3$: -

(1) $CH_3CH_2CH = C\begin{matrix}CH_3\\CH_3\end{matrix}$

(2) $CH_3CH_2CH = CHCH_2CH_3$

(3) $CH_3CH_2CH = CHCH_3$

(4) $CH_3 - \underset{\underset{CH_3}{|}}{C} = CHCH_3$

Q.54 Intermediates formed during reaction of $RC\overset{\overset{O}{||}}{N}H_2$ with Br_2 and KOH are : -

(1) RCONHBr and RNCO

(2) RNHCOBr and RNCO

(3) RNH-Br and RCONHBr

(4) $RCONBr_2$

Q.55 An organic compound A(C_4H_9Cl) on reaction with Na/diethyl ether gives a hydrocarbon which on monochlorination gives only one chloro derivative then, A is : -

(1) t-butyl chloride

(2) sec. butyl chloride

(3) Iso butyl chloride

(4) n-butyl chloride

Q.56 Which of the following is incorrect : -

(1) $FeCl_3$ is used in detection of phenol

(2) Fehling solution is used in detection of glucose

(3) Tollen reagent is used in detection of unsaturation

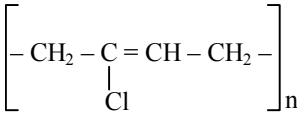
(4) $NaHSO_3$ is used in detection of carbonyl compound

Q.57 Which of following give positive Fehling solution test

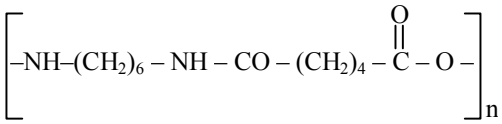
(1) Sucrose (2) Glucose

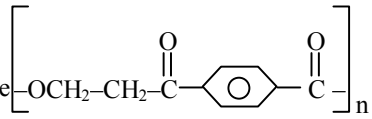
(3) Fats (4) Protein

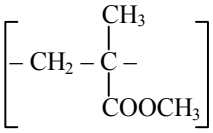
Q.58 Which of the following is not correctly matched

(1) Neoprene 

(2) Nylon-66



(3) Terylene 

(4) PMMA 

Q.59 Which of the following is correct : -

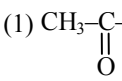
(1) Cyclo heptane is an aromatic compound

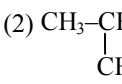
(2) Diastase is an enzyme

(3) Acetophenone is an ether

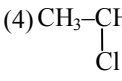
(4) All the above

Q.60 The incorrect IUPAC name is : -

(1)  2-methyl-3-butanone

(2)  2, 3-dimethyl pentane

(3) $CH_3–C\equiv CCH(CH_3)_2$ 4-methyl-2-pentyne

(4)  2-bromo-3-chloro butane

Q.61 In preparation of alkene from alcohol using Al_2O_3 which is effective factor : -

(1) Porousity of Al_2O_3

(2) Temperature

(3) Concentration

(4) Surface area of Al_2O_3

Q.62 Which of following is correct : -

(1) Any aldehyde gives secondary alcohol on reduction

(2) Reaction of vegetable oil with H_2SO_4 give glycerin

(3) C_2H_5OH, iodine with NaOH gives iodoform

(4) Sucrose on reaction with NaCl give invert sugar

Q.63 Which of the following is correxct about H-bonding in nucleotide : -

(1) A–T G–C (2) A–G T–C

(3) G–T A–C (4) A–A T–T

Q.64 Which is correct statement : -

(1) Starch is polymer of α-glucose

(2) Amylose is a component of cellulose

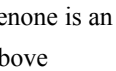
(3) Proteins are composed of only one type of amino acid

(4) In cyclic structure of fructose, there are four carbons and one oxygen atom

Q.65  (peptide bond)

which statement is incorrect about peptide bond : -

(1) C–N bond length in protiens is longer than usual bond length of N-bond

(2) Spectroscopic analysis show planar structure of 

(3) C–N bond length in proteins is smaller than usual bond length of C–N bond

(4) None of above

Q.66 In steam distillation of toluene, the pressure of toluene in vapour is : -

(1) Equal pressure of barometer

(2) Less than pressure of barometer

(3) Equal to vapour pressure to toluene in simple distillation

(4) More than vapour pressure of toluene in simple distillation

Q.67 A compound of molecular formula is C_7H_{16} shows optical isomerism, compound will be

(1) 2, 3-dimethyl pentane

(2) 2, 2-dimethyl butane

(3) 2-methyl hexane

(4) None of the above

Q.68 Change in enthalpy for reaction

$2H_2O_2(\ell) \rightarrow 2H_2O(\ell) + O_2(g)$

If heat of formation of $H_2O_2(\ell)$ and $H_2O(\ell)$ are – 188 & – 286 KJ/mol respectively : -

(1) – 196 KJ/mol (2) + 196 KJ/mol

(3) + 948 KJ/mol (4) – 948 KJ/mol

Q.69 When 1 mol gas is heated at constant volume temp. is raised from 298 to 308 K. Heat supplied to the gas is 500 J. Then which statement is correct : -

(1) $q = w = 500$ J, $\Delta U = 0$

(2) $q = \Delta U = 500$J, $w = 0$

(3) $q = w = 500$ J, $\Delta U = 0$

(4) $\Delta U = 0$, $q = w = -500$ J

Q.70 Enthalpy of $CH_4 + \frac{1}{2}O_2 \rightarrow CH_3OH$ is negative.

If enthalpy of combustion of CH_4 and CH_3OH and x and y respectively. Then which relation is correct : -

(1) $x > y$ (2) $x < y$ (3) $x = y$ (4) $x \geq y$

Q.71 For the reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$ rate and rate constant are 1.02×10^{-4} and 3.4×10^{-5} sec^{-1} respectively.Then conc.of N_2O_5 at that time will be : -

(1) 1.732 (2) 3

(3) 1.02×10^{-4} (4) 3.4×10^{5}

Q.72 A human body required the 0.01 Curie activity of radioactive susbtance after 24 hours. Half life of radioactive is 6 hours. Then max. activity of radioactive sustance that can be injected will be : -

(1) 0.08 (2) 0.04 (3) 0.16 (4) 0.32

Q.73 When a bio chemical reaction is carried out in laboratory out side the human body in the absence of enzyme, then the rate of reaction obtained is 10^{-6} times, than activation energy of reaction in the presence of enzyme is : -

(1) $\frac{6}{RT}$

(2) P is required

(3) Different from, E_a obtained in laboratery

(4) Can't say any things

Q.74 Molarity of liquid HCl if density of liq. HCl is 1.17 gm/cc : -

(1) 36.5 (2) 18.25 (3) 32.05 (4) 42.10

Q.75 Percentage of Se in peroxidase anhydrous enzyme is 0.5% by weight (at. wt = 78.4) then minimum molecular weight of peroxidase anhydrous enzymes is : -

(1) 1.568×10^{4} (2) 1.568×10^{3}

(3) 15.68 (4) 2.136×10^{4}

Q.76 Sp. vol. of cylinderical virus particle is 6.02×10^{-2} cc/gm. Whose radius and length are 7 Å & 10Å respectively. If $N_A = 6.02 \times 10^{23}$. Find mol. wt. of virus : -

(1) 1.54 kg/mol.

(2) 1.54×10^{4} kg/mol.

(3) 3.08×10^{4} kg/mol.

(4) 3.08×10^{3} kg/mol.

Q.77 Pure water can be obtain from sea water by

(1) Centrifugation (2) Plasmolysis

(3) Reverse osmosis (4) Sedimentation

Q.78 Stand electrode potential are

Fe^{+2}/Fe $E^{o} = -0.44$

Fe^{+3}/Fe^{+2} $E^{o} = 0.77$

If Fe^{+2}, Fe^{+3} and Fe block re kept together, then :-

(1) Fe^{+3} increases

(2) Fe^{+3} decreases

(3) $\frac{Fe^{+2}}{Fe^{+3}}$ reamins unchanged

(4) Fe^{+2} decreases

Q.79 Which is not correct regarding the adsorption of a gas on surface of solid: -

(1) On increasing temp. adsorption increase continuously

(2) Enthalpy & entropy change is – Ve

(3) Adsorption is more for some specific substance

(4) Reversible

Q.80 $PbO_2 \rightarrow PbO$ $\Delta G_{298} < 0$

$SnO_2 \rightarrow SnO$ $\Delta G_{298} > 0$

Most probable oxidation state of Pb & Sn will be :

(1) Pb^{+4}, Sn^{+2} (2) Pb^{+4}, Sn^{+2}

(3) Pb^{+2}, Sn^{+2} (4) Pb^{+2}, Sn^{+4}

Q.81 Which of the following two species in the pair are isostructural : -

(1) XeF_2, IF_2^- (2) NH_3, BF_3

(3) CO_3^{-2}, SO_3^{-2} (4) PCl_5, ICl_5

Q.82 In which of the following bond angle is maximum :

(1) NH_3 (2) NH_4^+

(3) PCl_3 (4) SCl_2

Q.83 Which of the following statement is not correct

(1) $La(OH)_3$ is less basic than $Lu(OH)_3$

(2) In Lanthanide series ionic radius of Ln^{+3} ions decreases

(3) La is actually an element of transition series rather Lanthanide

(4) Aomic radius of Zr and Hf are same because of Lanthanide contraction

Q.84 Correct order of I^{st} IP among following elements Be, B, C, N, O is : -

(1) B < Be < C < O < N

(2) B < Be < C < N < O

(3) Be < B < C < N < O

(4) Be < B < C < O < N

Q.85 Which of the following will give maximum number of isomers : -

(1) $[Co(NH_3)_4Cl_2]$

(2) $[Ni(en)(NH_3)_4]^{+2}$

(3) $[Ni(C_2O_4)(en)_2]^{-2}$

(4) $[Cr(SCN)_2(NH_3)_4]^{+}$

Q.86 Coordination number of Ni in $[(C_2O_4)_3]^{-4}$ is

(1) 3 (2) 6

(3) 4 (4) 2

Q.87 Which of following organometallic compound is σ and π bonded : -

(1) $[Fe(\eta^5 - C_5H_5)_2]$

(2) $K[PtCl_3(\eta^2 - C_2H_4)]$

(3) $[Co(CO)_5NH_3]^{+2}$

(4) $Fe(CH_3)_3$

Q.88 Which statement is incorrect : -

(1) $Ni(CO)_4$ – Tetrahedral, paramagnetic

(2) $Ni(CN)_4^{-2}$ - Square planar, diamagnetic

(3) $Ni(CO)_4$ - Tetrahedral, diamagnetic

(4) $[Ni(Cl)_4]^{-2}$ – Tetrahedral, paramagnetic

Q.89 In X- H ----- Y, X and Y both are electronegative elements : -

(1) Electro density on X will increase and on H will decrease

(2) In both electron density will increase

(3) In both electron density will decrease

(4) On X electron density will decrease and on H increases

Q.90 Main axis of a diatomic molecule is z, molecular orbtial p_x and p_y overlaps to form, which of the following orbital : -

(1) π molecular orbtial

(2) σ molecular orbital

(3) δ molecular orbtial

(4) No bond will form

Q.91 Which of the following will exhibit maximum ionic conductivity : -

(1) $K_4[Fe(CN)_6]$ (2) $[Co(NH_3)_6]Cl_3$

(3) $[Cu(NH_3)_4]Cl_2$ (4) $[Ni(CO)_4]$

Q.92 The following quantum no's are possible for how many orbital n = 3, ℓ = 2, m = +2

(1) 1 (2) 2 (3) 3 (4) 4

Q.93 In HS^-, I^-, $R–NH_2$, NH_3 order of proton excepting tendency will be :-

(1) I– > NH_3 > $R–NH_2$ > HS^-

(2) NH_3 > R-NH_2 > HS^- > I^-

(3) RNH_2 > NH_3 > HS^- > I^-

(4) HS^- > RNH_2 > NH_3 > I^-

Q.94 The Beans are cooked earlier in pressure cooker, because : -

(1) B.P. increase with increasing pressure

(2) B.P. decrease with increasing pressure

(3) Extra pressure of pressure cooker, softens the beans

(4) Internal energy is not lost while cooking is pressure cooker

Q.95 The most convenient method to protect the bottom of ship made of iron is : -

(1) Coating it with Red lead oxide

(2) White tin plating

(3) Connecting it with Mg block

(4) Connecting it with Pb block

Q.96 Zn convert it's melted state to its solid state, it has HCP structure, then find out nearest no. of nearest atom : -

(1) 6 (2) 8 (3) 12 (4) 4

Q.97 Nitrogen form N_2, but phosphorous form P_2, it's at a time convert in P_4, reason is : -

(1) Triple bond present between phosphorous atom

(2) $p_\pi - p_\pi$ bonding is weak

(3) $p_\pi - p_\pi$ bonding is strong

(4) Multiple bond form easilly

Q.98 Ionisation constant of CH_3COOH is 1.7×10^{-5} and concentration of H^+ ions is 3.4×10^{-4}. Then find out initial concentration of CH_3COOH molecules : -

(1) 3.4×10^{-4} (2) 3.4×10^{-3}

(3) 6.8×10^{-4} (4) 6.8×10^{-3}

Q.99 Solubility of a M_2S salt is 3.5×10^{-6} then find out solubility product : -

(1) 1.7×10^{-6} (2) 1.7×10^{-16}

(3) 1.7×10^{-18} (4) 1.7×10^{-12}

Q.100 If a ${}^{b}_{a}X$ species emits firstly a positron, then two α and two β and at last one α is also after intially it fainally convets into stable ${}^{c}_{d}Y$ species so correct relation will be : -

(1) $c = b - 12,\ d = a - 5$

(2) $a = c - 8,\ d = b - 1$

(3) $a = c - 6,\ d = b - 0$

(4) $a = c - 4,\ a = b - 2$

Q.101 Independent assortment of genes does not takes place when : -

(1) Genes are located on homologous chromosomes

(2) Genes are linked and located on same chromosome

(3) Genes are located on non-homologous chromosome

(4) All the above

Q.102 What is true for monoclonal antibodies : -

(1) These antibodies obtained from one parent and for one antigen

(2) These obtained from different parents and for one antigen

(3) These obtained from one parent and for many antigens

(4) These obtained from many parents and for many antigen

Q.103 In Negative operon : -

(1) Inducer binds with repressor

(2) Co-repressor does not binds with repressor

(3) Corepressor binds with inducer

(4) CAMP have negative effect on lac operon

Q.104 What is true for plasmid : -

(1) Plasmids are widely used in gene transfer

(2) These are found in virus

(3) Plasmid contain gene for vital activities

(4) These are main part of chromosome

Q.105 Mendel obtained wrinkled seeds in pea due to deposition of sugars instead of starch. It was due to which enzyme : -

(1) Amylase

(2) Invertase

(3) Diastase

(4) Absence of starch branching enzyme

Q.106 Before the European invader which vegetable was absent in India :-

(1) Potato and Tomato

(2) Simla mirch and Brinjal

(3) Maize and chichinda

(4) Bitter gourd

Q.107 Which of the following is true pair of biofertilizers : -

(1) Azolla and BGA

(2) Nostoc and legume

(3) Rhizobium and grasses

(4) Salmonella & E. Coli

Q.108 Ratio of complementry genes is : -

(1) 9 : 3 : 4 (2) 12 : 3 : 1

(3) 9 : 3 : 3 : 4 (4) 9 : 7

Q.109 When dominant and recessive allels express itself together it is called : -

(1) Co-dominance

(2) Dominance

(3) Amphidominance

(4) Pseudo dominance

Q.110 A and B genes are linked. What shall be genotype of progeny in a cross between AB/ab and ab/ab : -

(1) AAbb and aabb (2) AaBb and aabb

(3) AABB and aabb (4) None

Q.111 Which statement correct about centre of origin of plant : -

(1) More diversity in improved variety

(2) Frequency of dominant gene is more

(3) Climatic condition more favourable

(4) None

Q.112 Probability of four son to a couple is : -

(1) $\frac{1}{4}$ (2) $\frac{1}{8}$ (3) $\frac{1}{16}$ (4) $\frac{1}{32}$

Q.113 Two nonallelic genes produces the new phenotype when present together but fail to do so independently then it is called : -

(1) Epistasis

(2) Polygene

(3) Non complimentry gene

(4) Complimentry gene

Q.114 Which of the following cut the DNA from specific places : -

(1) Restriction endonuclease (EcoRI)

(2) Ligase

(3) Exonuclease

(4) Alkaline phosphate

Q.115 Tetradynamous conditions occur in : -

(1) Cruciferae (2) Malvaceae

(3) Solanaceae (4) Liliaceae

Q.116 Which is correct pair for edible part : -

(1) Tomato – Thalamus

(2) Maize - Cotyledons

(3) Guava - Mesocarp

(4) Date palm - Pericarp

Q.117 Bicarpellary gyanoecium and oblique ovary occurs in : -

(1) Mustard (2) Banana

(3) Pisum (4) Brinjal

Q.118 Edible part of Banana : -

(1) Epicarp

(2) Mesocarp and less developed endocarp

(3) Endocarp and less developed mesocarp

(4) Epicarp & mesocarp

Q.119 In *Hydra*, waste material of food digestion and nitrogenous waste material removed from : -

(1) Mouth and mouth

(2) Body wall and body wall

(3) Mouth and body wall

(4) Mouth and tentacles

Q.120 In which of the following animal post anal tail is found

(1) Earthworm (2) Lower invertebrate

(3) Scorpion (4) Snake

Q.121 In which of the following haemocyanin pigment is found : -

(1) Annelida (2) Echinodermata

(3) Insecta (4) Lower chrodata

Q.122 Anemophilly type of pollination is found in

(1) Salvia (2) Bottle brush

(3) Vallisneria (4) Coconut

Q.123 What is the eye of potato : -

(1) Axillary bud (2) Accessory bud

(3) Adventitious bud (4) Apical bud

Q.124 Due to discovery of which of the following in 1980, the evolution was termed as RNA world :

(1) m-RNA, t-RNA- r-RNA synthesise proteins

(2) In some virus RNA is genetic material

(3) RNA have enzymatic property

(4) RNA is not found in all cells

Q.125 Which pair is wrong : -

(1) C_3 – Maize

(2) C_4 – Kranz anatomy

(3) Calvin cycle - PGA

(4) Hatch and Slake cycle – O.A.A.

Q.126 Which breaks dormancy of potato tuber : -

(1) Gibberellin (2) IAA

(3) ABA (4) Zeatin

Q.127 Hormone responsible for senescence : -

(1) ABA (2) Auxin

(3) GA (4) Cytokinin

Q.128 Which of the following prevents the fall of fruits : -

(1) GA_3 (2) *NAA*

(3) Eethylene (4) Zeatin

Q.129 Loading of phloem is related to : -

(1) Increase of sugar in phloem

(2) Elongation of phloem cell

(3) Separation of phloem parenchyma

(4) Strengthening of phloem fiber

Q.130 Which pigment system inactivated in red drop : -

(1) PS-I and P.S-II (2) PS – I

(3) PS – II (4) None

Q.131 Which plant is LDP : -

(1) *Tobacco* (2) *Glycine max*

(3) *Mirabilis jalapa* (4) Spinach

Q.132 What is true for photolithotrops : -
(1) Obtain energy from radiations and hydrogen from organic compounds
(2) Obtain energy from radiations and hydrogen from inorganic compounds
(3) Obtain energy from organic compounds
(4) Obtain energy from inorganic compounds

Q.133 In which of the following plant sunken stomata are found : -
(1) Nerium (2) Hydrilla
(3) Mango (4) Guava

Q.134 What is the best pH of the soil for cultivation of plants : -
(1) 3.4 – 5.4 (2) 6.5 – 7.5
(3) 4.5 – 8.5 (4) 5.5 – 6.5

Q.135 Which fish selectively feed on larva of mosquito : -
(1) Gambusia (2) Rohu
(3) Clarias (4) Exocoetus

Q.136 Which one of the following is correct match
(1) Reserpine – Tranquilliser
(2) Cocaine – opiatic narcotic
(3) Morphine – Hallucinogenic
(4) Bhang – Analgesic

Q.137 What is B.O.D. : -
(1) The amount of O_2 utilised by organisms in water
(2) The amount of O_2 utilized by micro organisms for decomposition
(3) The total amount of O_2 present in water
(4) All of the above

Q.138 In grasses what happens in micro spore mother cell for the formation of mature pollen grains : -
(1) One meiotic and two mitotic divisions
(2) One meiotic & one mitotic divisions
(3) One meiotic division
(4) One mitotic division

Q.139 What is the intensity of sound in normal conversation : -
(1) 10 – 20 decibal (2) 30 – 60 decibal
(3) 70 – 90 decibal (4) 120 – 150 decibal

Q.140 Adventive embryony in citrus is due to : -
(1) Nucellus (2) Integuments
(3) Zygotic embryo (4) Fertilized egg

Q.141 L.S.D. is : -
(1) Hallucinogenic (2) Sedative
(3) Stimulant (4) Tranquiliser

Q.142 Which set is similar : -
(1) Corpus luteum – graffian follicles
(2) Sebum-sweat
(3) Bundle of his – Pace macker
(4) Vita B_7 - Niacin

Q.143 Salmonella is related with : -
(1) Typhoid (2) Polio
(3) T.B. (4) Tetanus

Q.144 Difference in gram $\oplus$ and gram $\ominus$ bacteria is due to -
(1) Cell wall (2) Cell membrane
(3) Ribosome (4) Cytoplasm

Q.145 What is sarcomere : -
(1) Part between two H-line
(2) Part between two A-line
(3) Part between two I-band
(4) Part between two Z-line

Q.146 Which statement is correct for muscle contraction : -
(1) Length of H-zone become decrease
(2) Length of A-band remains constant
(3) Length of I-band become increase
(4) Length of two Z-line become increase

Q.147 Characteristics character of human cornea
(1) Secreted by conjuctiva and glandular
(2) It has lacrimal gland which secrete tears
(3) Blood circulation is absent in cornea
(4) In old age it become harden and white layer deposite on it which causes the cataract

Q.148 Which of the most infectious disease is : -
(1) Hepatitis -B (2) AIDS
(3) Cough and cold (4) Malaria

Q.149 Interferons are synthesized in response to
(1) Mycoplasma (2) Bacteria
(3) Viruses (4) Fungi

Q.150 Cauliflower mosaic virus contains : -
(1) ss RNA (2) ds RNA
(3) ds DNA (4) ss DNA

Q.151 Reason of lung cancer : -
(1) Coal mining (2) Calcium fluoride
(3) Cement factory (4) Bauxite mining

Q.152 When water moves through a semipermeable membrane then which of the following pressure develops : -
(1) O.P. (2) S.P. (3) T.P. (4) W.P.

Q.153 Proteinaceous pigment which control the activities concerned with light : -
(1) Phytochrome (2) Chlorophyll
(3) Anthocyanin (4) Carotenoids

Q.154 Glycolate induces opening of stomata in : -
(1) Presence of oxygen (2) Low CO_2 conc.
(3) High CO_2 (4) CO_2 absent

Q.155 Enzyme first used for nitrogen fixation : -
(1) Nitrogenase (2) Nitroreductase
(3) Transferase (4) Transaminase

Q.156 Maximum number of bases in plasmids discovered so far : -
(1) 50 kilo base (2) 500 kilo base
(3) 5000 kilo base (4) 5 kilo base

Q.157 Passive absorption of minerals depend on
(1) Temperature
(2) Temperature and metabolic inhibitor
(3) Metabolic inhibitor
(4) Humidity

Q.158 Half life period of C^{14} is : -
(1) 500 years (2) 5000 years
(3) 50 years (4) 5×10^4 years

Q.159 Which one correctly matched : -
(1) Vit. E – Tocoferole
(2) Vit. D – Riboflavin
(3) Vit. B – Calciferole
(4) Vit. A – Thiamine

Q.160 *E. Coli* about to replicate was placed in a medium containing radio active thymidine for five minutes. Then it was made to replicate in a normal medium. Which of the following observation shall be correct : -
(1) Both the strands of DNA will be radio active
(2) One strand radio active
(3) Each strand half radio active
(4) None is radio active

Q.161 Most abundant organic compound on earth is
(1) Protein (2) Cellulose
(3) Lipids (4) Steroids

Q.162 Male XX and female XY sometime occur due to
(1) Deletion
(2) Transfer of segments in X and Y chromosomes
(3) Aneuploidy
(4) Hormonal imbalance

Q.163 No. of Bar Body in XXXX female : -
(1) 1 (2) 2
(3) 3 (4) 4

Q.164 Types of RNA polymerase required in nucleus for RNA synthesis : -
(1) 1 (2) 2
(3) 3 (4) 4

Q.165 What is true for Archaebacteria : -
(1) All Halophiles (2) All photosynthetic
(3) All fossils (4) Oldest living beings

Q.166 Extranuclear inheritence occurs in : -
(1) Killer paramaecium
(2) Killer Amoeba
(3) Euglena
(4) Hydra

Q.167 Extranuclear chromosomes occur in : -
(1) Peroxisome, Ribosome
(2) Chloroplast and Mitochondria
(3) Mitochondria and Ribosome
(4) Chloroplast and Lysosome

Q.168 Spoilage of oil can be detected by which fatty acid : -
(1) Oleic acid (2) Linolenic acid
(3) Linoleic acid (4) Erusic acid

Q.169 When we migrate from dark to light, we fail to see for sometimes but after a time visibility becomes normal. It is example of
(1) Accomodation
(2) Adaptation
(3) Mutation
(4) Photoperiodism

Q.170 In plants inulin and pectin are
(1) Reserved material
(2) Wastes
(3) Excretory material
(4) Insect attracting material

Q.171 Gene and cistron words are sometimes used synonymously because : -
(1) One cistron contains many genes
(2) One gene contains many cistrons
(3) One gene contains one cistron
(4) One gene contains no cistron

Q.172 Element necessary for the middle lamella
(1) Ca (2) Zn
(3) K (4) Cu

Q.173 **Cycas** have two cotyledons but not included in angiosperms becuase of : -
(1) Naked ovules
(2) Seems like monocot
(3) Circinate ptyxis
(4) Compound leaves

Q.174 Plant Decomposers are : -
(1) Monera and fungi
(2) Fungi and plants
(3) Protista and Animalia
(4) Anibalia and Mogna

Q.175 What is true for cyano bacteria : -
(1) Oxygenic with nitrogenase
(2) Oxygenic without nitrogenase
(3) Non oxygenic with nitrogenase
(4) Non oxygenic without nitrogenase

Q.176 m-RNA is synthesised on DNA template in which direction : -
(1) 5' $\rightarrow$ 3' (2) 3' $\rightarrow$ 5'
(3) Both (4) Any

Q.177 Cytochrome is : -
(1) Metallo flavo protein
(2) Fe containing porphyrin pigment
(3) Glycoprotein
(4) Lipid

Q.178 Which of the following less general in characters as compared to genus : -
(1) Species (2) Division
(3) Class (4) Family

Q.179 Adhesive pad of fungi penetrate the host with the help of : -
(1) Mechanical pressure and enzymes
(2) Hooke and suckers
(3) Softening by enzymes
(4) Only by mechanical pressure

Q.180 Microtubules absent in : -
(1) Mitochondria (2) Flagella
(3) Spindle fibres (4) Centriole

Q.181 Which aquatic fern performs nitrogen fixation : -
(1) Azolla (2) Nostoc
(3) Salvia (4) Salvinia

Q.182 Roots of which plant contains a red pigment which have affinity for oxygen : -
(1) Carrot (2) Soyabean
(3) Mustard (4) Radish

Q.183 Triticale is obtained by crossing wheat with
(1) Oat (2) Barley (3) Maize (4) Rye

Q.184 At the time of organogenesis genes regulate the process at different levels and at different time due to :
(1) Promoter (2) Regulator
(3) Intron (4) Exon

Q.185 A mutant strain of T_4 – Bacteriophage, R-II, fails to lyse the *E-Coli* but when two strains R-II^X and R-II^Y are mixed then they lyse the *E.Coli.* What may be the possible reason : -
(1) Bacteriophage transforms in wild
(2) It is not mutated
(3) Both strains have simillar cistrons
(4) Both strains have different cistrons

Q.186 Reason of diversity in living being : -
(1) Mutation
(2) Long term evolutionary change
(3) Gradual change
(4) Short term evolutionary change

Q.187 Sickle cell anaemia is due to : -
(1) Change of Amino Acid in α-chain of Haemoglobin
(2) Change of Amino Acid in β-chain of Haemoglobin
(3) Change of Amino acid in both α and β chain of Haemoglobin
(4) Change of Amino acid either α or β chain of Haemoglobin

Q.188 Similarities in organism with different genotype indicates : -
(1) Microevolution
(2) Macroevolution
(3) Convergent evolution
(4) Divergent evolution

Q.189 What is correct for Blood group 'O' : -

(1) No antegens but both a and b antibodies are present

(2) A antegen and b antibody

(3) Antigen and Antibody both absent

(4) A and B antigens and a, b, antibodies

Q.190 Which of the following is closest relative of man : -

(1) Chimpanzee (2) Gorilla

(3) Orangutan (4) Gibbon

Q.191 Which of the following is correct order of the evolutionary history of man : -

(1) Peking man, Homo sapiens, Neanderthel man, Cromagnon man

(2) Peking man, Neanderthal man, Homosapiens Cromagnon man

(3) Peking man, Hedalberg man, Neanderthal man, Cromagnon man

(4) Peking man, Neanderthal man, Homosapiens Hedalberg man

Q.192 Which cells do not form layer and remains structurally seperate : -

(1) Epithelial cells (2) Muscle cells

(3) Nerve cells (4) Gland cells

Q.193 During an injury Nasal septum gets damaged and for it's recovery which cartilage prefered : -

(1) Elastic cartilage (2) Hyaline cartilage

(3) Calcified cartilage (4) Fibrous cartilage

Q.194 First life on earth was : -

(1) Cyanobacteria

(2) Chemohetrotrophs

(3) Autotrophs

(4) Photoautotrophs

Q.195 Frequency of an allele in an isolated population may change due to : -

(1) Genetic drift (2) Gene flow

(3) Mutation (4) Natural selection

Q.196 In lederberg's replica plating experiment what shall be used to obtain streptomycin resistant strain : -

(1) Minimal medium and streptomycine

(2) Complete medium and streptomycine

(3) Only minimal medium

(4) Only complete medium

Q.197 Forecomming generations are less adaptive than their parental generation due to : -

(1) Natural selection (2) Mutation

(3) Genetic drift (4) Adaptation

Q.198 During regeneration, modification of an organ to other organ is known as : -

(1) Morphallogenesis

(2) Epimorphosis

(3) Morphallaxis

(4) Accretionary growth

Q.199 Occurence of endemic species in south america and Australia due to : -

(1) These species has been extinct from other regions

(2) Continental separation

(3) These is no terrestrial route to these places

(4) Retrogressive evolution

Q.200 Darwins theory of pangenesis shows similarity with theory of inheritance of acquired characters then what shall be correct according to it : -

(1) Useful organs become strong and developed while useless organs become extinct. These organs help in struggle for survival

(2) Size of organs increase with aging

(3) Development of organs is due to will power

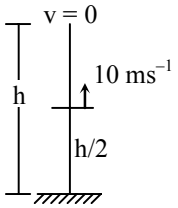
(4) There should be some physical basis of inheritance

ANSWER KEY (AIPMT-2001)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans	3	3	1	3	3	2	2	3	2	2	1	1	1	1	2	1	2	3	2	1
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	2	2	2	2	1	1	2	1	1	1	2	3	1	1	1	1	2	1	3	2
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	1	1	1	1	2	3	2	1	1	2	2	2	1	1	1	3	2	3	2	1
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans	2	3	1	1	1	2	1	1	2	2	2	3	3	3	1	1	3	2	1	4
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	1	2	1	1	4	2	3	1	1	1	1	1	3	1	3	3	2	4	2	1
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans	2	2	1	1	4	1	1	4	1	2	2	3	4	1	1	4	4	3	3	4
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans	1	4	1	3	1	1	1	2	1	3	4	2	1	4	1	1	2	1	2	1
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans	1	1	1	1	4	1,2	3	1	3	3	3	1	1	2	1	2	1	2	1	2
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans	2	2	3	3	4	1	2	4	2	1	3	1	1	1	1	1	2	1	1	1
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans	1	2	4	4	4	2	2	3	1	1	3	3	2	2	1	2	2	2	2	4

HINTS & SOLUTIONS

5.



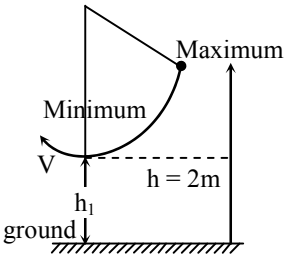
$v^2 = u^2 - 2g\ \frac{h}{2}$

$0 = (10)^2 - 10h$

$h = 10$ m

6. $K' = K\cos^2 45^\circ = K/2$

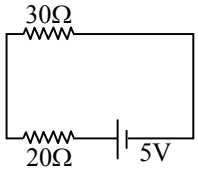
9.



Apply COME between max^m and min point

$mgh = Mgh_1 + \frac{1}{2}\ MV^2$

10. Equivalent ckt is



$I = \frac{5V}{(30+20)\Omega}$

$I = \frac{5}{50}A$

12. $E = \frac{kx^2}{2} = \frac{k^2x^2}{2k} \Rightarrow E = \frac{f^2}{2k}$

$\because$ Force is equal $\quad \therefore\ E \propto \frac{1}{k}$

16. Carnot engine is an Ideal engine so its efficiency will be will be maximum

$\therefore\ \eta_{max.} = \frac{400-300}{400} \times 100\% = 25\%$

therefore 26% efficient engine is impossible

17. Impulse = change in momentum

$F = \frac{\Delta P}{\Delta t} = \frac{150\times10^{-3}\times20}{0.1} = 30$ N

18. $n = \frac{1}{2\ell}\sqrt{\frac{T}{\pi r^2 \rho}}$

$\rho_1 = \frac{\rho}{2}$, $T^1 = 2T$ and $D^1 = 2D$ या $r_1 = 2r$

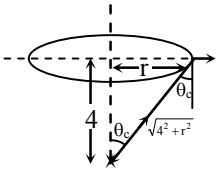
$n^1 = \frac{1}{2\ell}\sqrt{\frac{2T}{\pi(2r)^2\frac{\rho}{2}}} = \frac{1}{2\ell}\sqrt{\frac{T}{\pi r^2\rho}} = n$

$\Rightarrow$ No change

20. Apply energy consevation $\frac{-GMm}{R} + \frac{1}{2}mv^2$

$= -\frac{GMm}{2R} \Rightarrow v = \sqrt{\frac{GM}{R}}$

21.



$\sin\theta c = \frac{1}{\mu} = \frac{1}{5/3}$

$\Rightarrow \frac{r}{\sqrt{4^2+r^2}} = \frac{3}{5}$

$\Rightarrow \boxed{r = 3}$

23. Heat flow rate $= \frac{KA(T_1 - T_2)}{L} = Q$

when linear dimensions are doubled

$A_1 \propto r_1^2$, $L_1 = L$

$A_2 \propto 4r_1^2$, $L_1 = 2L_1$ so $Q_2 = 2Q_1$

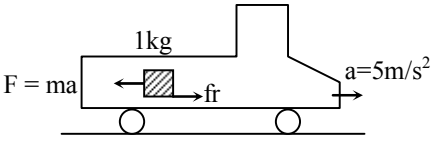
24. $\left|\vec{A}+\vec{B}\right|^2 = A^2 + B^2 + 2AB\cos\theta$

$\Rightarrow A^2 = A^2 + A^2 + 2A^2\cos\theta$

$\Rightarrow \cos\theta = -\frac{1}{2} \Rightarrow \theta = 120^\circ$

29. Energy density $= \frac{1}{2}\epsilon_0\frac{v^2}{d^2}$

30.



$fr_L = \mu_s.N$ pseudo force = ma

$= \mu s.mg$ $= 1 \times 5$

$= 0.6 \times 1 \times 10$ $F = 5$ N

$= 6N$

$\therefore F < fr_L$ block does not move

static firction = applied force

$\Rightarrow \boxed{fr = 5N}$

34. Solve by $x = \frac{I_\rho}{A}$

35. $I = t^2e^{-t}$

$\mathbf{e = L}\frac{d\ell}{dt}$ here emf is zero when $\frac{d\ell}{dt} = 0$

$\frac{d\ell}{dt} = 2te^{-t} - t^2e^{-t} = 0$

$\Rightarrow te^{-t}(t-2) = 0 \Rightarrow t = 2$ sec

36. $\frac{I_C}{I_E} = \alpha = 0.98$; $\frac{I_C}{I_B} = \beta = \frac{\alpha}{1-\alpha} = 49$

40. $2d\sin\theta = n\lambda \because -1 \le \sin\theta \le 1$

Therefore $\lambda_{max.} = 2d \Rightarrow \lambda_{max.} = 2 \times 2.8 \times 10^{-8}$m

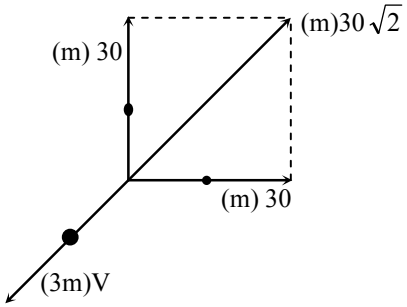
$\Rightarrow \lambda_{max.} = 5.6 \times 10^{-8}$ m

46. $\eta = \frac{\text{useful work}}{\text{total work}} = \frac{mgh}{F \times d} = \frac{(75g)\times 3}{250\times 12} = 0.75$

49. Apply conservation of linear momentum

$\Rightarrow 3mV = 30\sqrt{2}$ m

$\Rightarrow V = 10\sqrt{2}$



52. $CH_3–CH_2–CH_2–CH_3 \rightarrow CH_3–CH_2CH–CH_3$

intermediate Sp^2 hybrid planar

shape $\xrightarrow{Cl}$ recemic mix

planr shape (समतलीय आकृति) पर reagent का आक्रमण दोनों तरफ से हो सकता है।

70. $CH_4 + \frac{1}{2}O_2 \rightarrow CH_3OH$

$\Delta H = x - y$ given $\Delta H = -$ ve

Hence $x - y < 0$ $x < y$

71. $2N_2O_5 \rightarrow 4NO_2 + O_2$

this is a first order reaction

$\therefore$ rate $= K[N_2O_5]\ [N_2O_5] = \frac{\text{rate}}{K}$

72. At the end of 25 hrs. activity = 0.01 M

half life = 6 hrs

In 24 hrs. there are $\frac{24}{6} = 4$ half life

Activity of susbtance after n half life $= \frac{(A)}{2^n}$

$\Rightarrow \frac{(A)}{2^4} = 0.01$ $(A) = 0.16$

74. Density = 1.17 gm/cc.

$\Rightarrow$ 1cc. solu. contains 1.17 gm of HCl

$\therefore$ molarity $= \frac{1.17\times1000}{36.5\times1}$

75. In peroxidase anlydrous enzyme 0.55 Se is present means, 0.5gm. Se is present in 100gm of enzyme

In a molecule of enzyme one Se atom must be present hence 78.4 gm Se will be present in

$\frac{100}{0.5} \times 78.4 = 1.568 \times 10^4$

76. Sp. vol (vol. of 1gm) cylindrical virus particle $= 6.02 \times 10^{-2}$ cc/gm

radius of virus r = 7Å $= 7 \times 10^{-8}$ cm

length of virus $= \pi r^2 \ell$

$= \frac{22}{7} \times (7 \times 10^{-8})^2 \times 10 \times 10^{-8} = 154 \times 10^{-23}$cc

wt. of one virus particle $= \frac{\text{Vol.}}{\text{Sp.vol.}}$

$\Rightarrow \frac{154\times10^{-23}}{6.02\times10^{-2}}$ gm

$\therefore$ mol. wt. of virus = wt. of N_A particles

$= \frac{154\times10^{-23}}{6.02\times10^{-2}} \times 6.02 \times 10^{+23}$ gm/mol

= 15400 gm/mol = 15.4 kg/mol