## NEET GRAND TEST-19

**91. Read the following statements and Identify the correct statement/s.**

**A: A choice of change of different units change the number of significant digits.**

**B: To remove ambiguities in determining the number of significant figures, the best way is to report the measurement in scientific notation.**

**C: Solid angle made by a hemisphere at its centre is 4 $\pi$ steradian.**

**□□□□ n□y □ is tr□e** **□□□□ n□y □ is tr□e**

**□□□□□th □ and □ are tr□e** **□□□□ □□ and C are tr□e**

**Key : 2**

**Solution : Change of units never change significant figures.**

$$\text{Solid angle} = \frac{\text{S□r□a□e area}}{r^{□}} = \frac{□\pi r^{□}}{\pi^{□}} = □\pi$$

**92. A particle moving on a straight line velocity is given by $V = □e^{□x}$ then acceleration of particle when velocity is $10 m/s$ is**

□□□ □□□$m$ □$s^{□}$ □□□ □□□$m$ □$s^{□}$ □□□ □□$m$ □$s^{□}$ □□□ □□$m$ □$s^{□}$

**Key : 1**

**Solution :** $□ = □ e^{□□}$

$$\frac{dv}{d□} = □ e^{□□}$$

$$a = \frac{dv}{dt} = □ □\frac{dv}{d□}$$

$$a = □ \times □ e^{□□} \rightarrow (□)$$

**Given V = 10 .**

$$□ e^{□□} = □□ \Rightarrow e^{□□} = \frac{□□}{□}$$

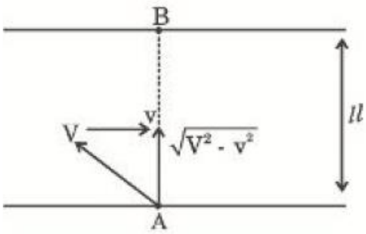
$$(1) \Rightarrow a = 10 \times 8 \times \frac{□□}{□} = □□□□ \; □s^{□}$$

93. **An aeroplane is to go along straight line from A to B, and back again. The relative speed with respect to wind is V. The wind blows perpendicular to line AB with speed v. The distance between A and B is *l*. The total time for the round trip is**

□□□ $\frac{\square l}{\sqrt{V^{\square}-v^{\square}}}$ □□□ $\frac{\square vl}{V^{\square}-v^{\square}}$ □□□ $\frac{\square Vl}{V^{\square}-v^{\square}}$ □□□ $\frac{\square l}{\sqrt{V^{\square}+v^{\square}}}$

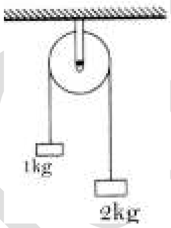
**Key : 1**

**Solution :**




$$\text{time} = \frac{\ell}{\sqrt{V^2 - v^2}} + \frac{\ell}{\sqrt{V^2 - v^2}} = \frac{2\ell}{\sqrt{V^2 - v^2}}$$

94. **Two unequal masses 1kg and 2 kg are connected on two sides of light string passing over a light and smooth pulley as shown. The system is released from rest. The larger mass is stopped for a moment, 1.0 sec after the system is in motion. The time elapsed before the string is tight again is (in sec)**




□□□□ □□□□ □□□□□ □□□□□

**Key : 4**

**Solution :** attwoods machine, $a = \left(\frac{2-1}{2+1}\right)g = \frac{g}{3}$ V=u+at=0+(g/3)1=g/3

For 1 kg mass: $h_1 = vt - \frac{1}{2}gt^2 = \left(\frac{g}{3}\right)t - \frac{1}{2}gt^2$

For 1 kg mass: $h_2 = \frac{1}{2}gt^2$ If $h_2 = h_1$ then t=1/3sec

95. **A ball is thrown with a velocity of 6m/s vertically downwards from a height H=3.2m above a horizontal floor. If it rebounds back to same height then coefficient of restitution e is** $\square g = \square\square m \square s^{\square}\square$

□□□□□ □□□□□ □□□□□ □□□□□

**Key : 4**

**Solution :** $V = 10 \quad e = \frac{V_1}{10} \quad \begin{array}{l} V_1 = 10e \\ V_1^2 = 4^2 + 2as \\ 100e^2 = 2 \times 10 \times 3.2 \\ e = 0.8 \end{array}$

**96. The force acting on the block is given by $F$ □ □ □□$t$ . The frictional force acting on the block at time t = 2s will be □μ □ □□□□**


□□□□□ □□□□□ □□□□□ □□□□er□

**Key : 1**

**Solution : At t = 0, F = 5N**

**f = 0.2 x 1 x 10 = 2N**

**As F > f, it in motion friction is kinetic**

**At t = 2 sec, F = 1N,**

**As F < f, body will move with retardation, but still friction is kinetic i.e., 2N only.**

**Kinetic friction is not self adjusting.**

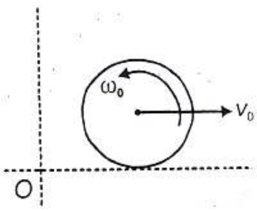
**97. When a ceiling fan is switched on, it makes 10 rotations in the first 3 seconds. How many rotations will it make in the next 3 seconds? (Assume uniform angular acceleration.)**

□□□□□ □□□□□ □□□□□ □□□□□

**Key : D**

**Solution :** $\omega^{□} - \omega_{□}^{□} = □ \propto \theta$

**98. A hollow sphere having mass m and radius R is rolling as shown in the figure. If the speed of centre of mass of sphere is $V_0$ and angular speed is $\omega_{□} = \frac{V_{□}}{R}$ The angular momentum of the sphere about point O is**




□□□ $\frac{□}{□} MV_{□}R$ □□□ $MV_{□}R$ □□□ $\frac{MV_{□}R}{□}$ □□□ $\frac{MV_{□}R}{□}$

**Key : 4**

**Solution :** $L_o = \frac{2}{3}MR^2 \times \frac{V_o}{R} \sim MV_oR = \frac{MV_oR}{3}$

**99. A wheel of radius R rolls on the ground with a uniform velocity `$v$`. The relative acceleration of topmost point of the wheel with respect to the bottom most point is**

□□□ $\frac{v^{□}}{R}$ □□□ $\frac{□v^{□}}{R}$ □□□ $\frac{v^{□}}{□R}$ □□□ $\frac{□v^{□}}{R}$

**Key : 2**

**Solution : Rel. acc of top most point w.r.t. bottom most**

$$\mathbf{a} = \frac{(□□)^{□}}{□□} = \frac{□□^{□}}{□}$$

**100. A body of mass ‘M’ is moving on a circular track of radius ‘r’ in such a way that its kinetic energy ‘k’ depends on the distance travelled by the body ‘s’ according to relation $k = \beta s$, where $\beta$ is a constant. The angular acceleration of the particle is**

□□□ $\frac{\beta r}{M^{□}}$ □□□ $\sqrt{\frac{\beta r}{M}}$ □□□ $\frac{M^{□}r}{\beta}$ □□□ $\frac{\beta}{Mr}$

**Key : 4**

**Solution :** $K = \beta s \quad \frac{1}{2}mv^2 = \beta s$

$$\mathbf{a}_{□} = \frac{\beta}{□} \Rightarrow \mathbf{r}\alpha = \frac{\beta}{□}$$

$$\alpha = \frac{\beta}{\mathbf{Mr}}$$

**101. A particle undergoes SHM with a time period of 2 seconds. In how much time will it travel from its mean position to a displacement equal to half of its amplitude?**

□□□ $\frac{□}{□}$**s** □□□ $\frac{□}{□}$**s** □□□ $\frac{□}{□}$**s** □□□ $\frac{□}{□}$**s**

**Key : D**

**Solution :** $\mathbf{y} = □\ \mathbf{sin}\omega\mathbf{t}$

**Here** $\mathbf{y} = \frac{□}{□}$

102. Two waves travelling in a medium in the x-direction are represented by $y_1 = A\sin(\alpha t - \beta x)$ and $y_2 = A\cos(\beta x + \alpha t - \pi/3)$, where $y_1$ and $y_2$ are the displacements of the particles of the medium, t is time, and $\alpha$ and $\beta$ are constants. The two waves have different

(A) Speeds (B) Directions of propagation

(C) Wavelenghts (D) Frequencies

Key : B

Solution : The first wave is propagating along positive X-axis, the second is along negative X – axis. But both the waves have same speed, frequency and wavelength

103. An astronaut of mass m is working in a satellite orbiting the earth at a distance h from the earth's surface. The radius of the earth is R, while its mass is M. The gravitational pull $F_G$ on the astronaut is

(1) Zero since astronaut feels weightlessness (2) $\frac{GMm}{(R+h)^2} < F_G < \frac{GMm}{R^2}$

(3) $F_G = \frac{GMm}{(R+h)^2}$ (4) $0 < F_G < \frac{GMm}{R^2}$

Key : 3

Solution : $F_G = \frac{G M_1 M_2}{d^2}$

104. A car is moving with a uniform speed on a level road. Inside the car there is a balloon filled with helium and attached to a piece of string tied to the floor. The string is observed to be vertical. The car now takes a left turn maintaining the speed on the level road. The balloon in the car will (Here the car is supposed to be air tight)

(1) Continue to remain vertical (2) Burst while taking the curve

(3) Be thrown to the right side (4) Be thrown to the left side

Key : 4

Solution : Due to pseudo force.

105. A raindrop reaching the ground with terminal velocity has momentum p. Another drop of twice the radius, also reaching the ground with terminal velocity, will have momentum

(A) 2p (B) 4p (C) 16p (D) 32p

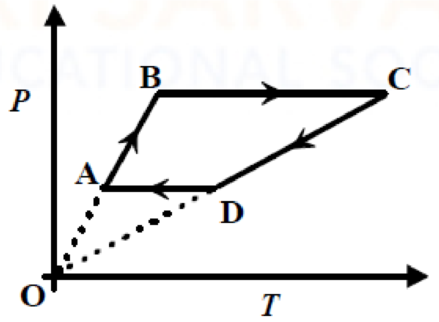
Key : D

Solution : $P = mV$

$V_t \propto r^2$

Hence $P \propto r^5$

**106. One mole of an ideal monatomic gas performs a cyclic process indicated by ABCDA. The temperatures of the gas at A, B, C and D are respectively T, 2T,6T and 3T. If R is the molar gas constant, the work done by the gas in the cyclic process is**




[illegible] [illegible] [illegible] [illegible]

**Key : 3**

**Solution :** $\omega_{[illegible]} = [illegible]$

$\omega_{[illegible]C} = \mathbf{p[illegible]d[illegible]} = \mathbf{n[illegible]\,d[illegible]}$

[illegible] **P.(4T)**

$\omega_{C[illegible]} = [illegible]$

$\omega_{[illegible]} = \mathbf{p[illegible]d[illegible]} = \mathbf{n[illegible]\,d[illegible]}$

[illegible] **P.(T-3T)**

**= [illegible]2RT**

**Total**

$\omega = ([illegible] - [illegible])$

**= 2RT**

**107. In a p-n junction, the depletion region is 400nm wide and an electric field of [illegible] $V/m$ exists in it. What should be the minimum kinetic energy of a conduction electron which can diffuse from the n-side to the p-side ?**

[illegible] **eV** [illegible] **eV** [illegible] **eV** [illegible] **eV**

**Key : 3**

**Solution :** **V = E.d**

$= [illegible] \times [illegible]^{[illegible]} \times [illegible] \times [illegible]^{-[illegible]}$

$= [illegible] \times [illegible]^{-[illegible]}$

**= 0.2 volt**

$\therefore$ □**nergy** = □□**e**□

**108. A solid sphere having a coefficient of cubical expansion '$\alpha$' is suspended from a rigid support with a thread in to a beaker containing a liquid of coefficient of real expansion '$\beta$' such that the sphere is completely submerged in the liquid. On heating the system, the tension in the string is found to be constant. This is possible when**

□□□$\alpha$ □ □$\times\beta$ □□□$\alpha$ □ $\beta$□□ □□□$\alpha$ □ $\beta$ □□□$\alpha$ □ □$\times\beta$

**Key: 3**

**Solution : T = mg - □□**

$\Delta$**T =** $\Delta$**mg -** $\Delta$□□

**Either** $\Delta$□ = □ **and we know that mg does not change on heating** $\Delta$□ **g** = □

**So,** $\Delta$□□ = □

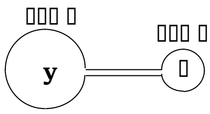
$\Delta$ □□ **d**□**g** = □

$\Delta\left(\frac{□}{d_□} d_□ g\right) = □$

$\Delta d_□ = \Delta d_□$

$\Rightarrow \boxed{\alpha = \beta}$

**109. In the figure the volume of flask Y is twice that of flask X and is connected by a narrow tube as shown. The system is filled with an ideal gas and the flasks X and Y are kept at 200 K and 400 K respectively. If the mass of the gas in X is "m", the mass of the gas in Y is**

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**Key: 3**

**Solution : PV = m r T**

$\frac{□_□}{□_□} = \frac{□_□}{□_□} □ \frac{□_□}{□_□}$

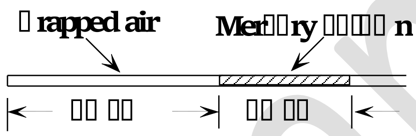
**110. Ice, water and steam co-exist at triple point temperature 273.16K and pressure 4.6mm Hg. In a system in which the triple point conditions of temperature and pressure exist, the pressure is increased a little while keeping the temperature constant, then the system contains**

□□□i□e □n□y　　□□□□ater □n□y　　□□□stea□ □n□y　　□□□□ater and i□e

**Key : 2**

**Solution : At triple point, when pressure is increased, it completely converts into water.**

**111. A 20 cm column of air is trapped by a column of Hg 15 cm long in a capillary tube of uniform bore when the tube is held horizontally in a room where the atmospheric pressure is 75 cm of mercury. The length of the air column, when the tube is held vertically with open end down will be**

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**Key: 2**

**Solution :** $P_{□} l_{□} = P_{□} l_{□}$

**112. Two spherical black bodies made of same material and with the same surface finish have masses $M_1$ and $M_2$ and are at temperatures $T_1$ and $T_2$. If they are radiating the same power, $M_{□}□M_{□}$ must be**

□□□ □□□ □□□□ □□　　□□□ □□□ □□□□ □□　　□□□ □□□ □□□□ □□　　□□□ □□□ □□□□ □□

**Key: 3**

**Solution :** $P = □ \, e\sigma □^{□}$

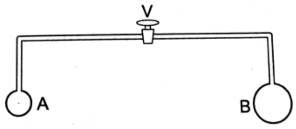
$$□ \, \alpha \frac{□}{□^{□}}$$

$$\Rightarrow (□)^{□□} \alpha \frac{□}{□^{□}}$$

$$\Rightarrow (M)^{□□} \alpha \frac{□}{□^{□}}$$

$$\Rightarrow \frac{M_{□}}{M_{□}} = \left(\frac{□_{□}}{□_{□}}\right)^{□\times\frac{□}{□}} = \left(\frac{□_{□}}{□_{□}}\right)^{□}$$

**113.**




**The valve V in the bent tube is initially kept closed. Two soap bubbles A (smaller) and B (larger) are formed at the two open ends of the tube. V is now opened, and air can flow freely between the bubbles.**

**[illegible] here [illegible] i[illegible]e n[illegible] [illegible]hange in the si[illegible]es [illegible] the [illegible]es**

**[illegible] he [illegible]es [illegible] i[illegible]e[illegible] e [illegible]e[illegible]a[illegible] si[illegible]e**

**[illegible] i[illegible]e[illegible] e s[illegible] a[illegible]er and [illegible] i[illegible]e[illegible] e [illegible]arger[illegible]**

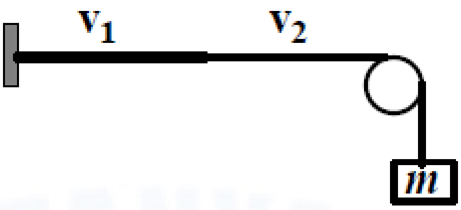
**[illegible] he si[illegible]es [illegible] the t[illegible] [illegible]es [illegible] i[illegible]e[illegible] e inter[illegible]hanged[illegible]**

**Key : 3**

**Solution :** $P \alpha \frac{[illegible]}{[illegible]}$ **and**

**P[illegible] [illegible] r[illegible]**

**114.** **A weight is hung over a pulley and attached to a string composed of two parts, each made of the same material but one having four times the diameter of the other. The string is plucked so that a pulse moves along it, moving at speed v1 in the thick part and at speed $v_2$ in the thin part. What is $v_1/v_2$ ?**

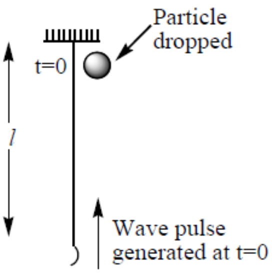



[illegible] [illegible] [illegible] [illegible]

**Key : 3**

**Solution :** [illegible] $= \sqrt{\frac{[illegible]}{\pi r^{[illegible]} d}} \Rightarrow$ [illegible] $\alpha \frac{[illegible]}{r}$

115. **A uniform rope of length 's' is suspended from a ceiling as shown. A particle is dropped from the ceiling at the instant a wave pulse is formed at the lower end. Where will be particle meet the pulse?**




(□□ $\frac{l}{□}$ **distan□e □r□□ the t□p** (□□ $\frac{l}{□}$ **distan□e □r□□ the □□tt□□**

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**Key : 2**

**Solution : Let 'x' be the distance from top, (*l* – x) from the bottom**

$t_{parti□□e} = t_{□ ave}$

$\sqrt{\frac{2x}{g}} = \sqrt{\frac{2(l-x)}{g/2}}$

$□ = \frac{□l}{□}$ **□r□□ t□p**

116. **A ray of light travels from an optically denser to a rarer medium. Maximum possible deviation is $\theta$. Maximum possible deviation if light travels from rarer to denser is**

(□□ $□\theta$ (□□ $\frac{\theta}{□}$ (□□ $\theta$ (□□ $\frac{\theta}{□}$

**Key : 2**

**Solution : <u>denser to rarer</u>, max. Deviation,** **d = (180 – 2C)**

**θ = (180 – 2C)**

**θ = 2(90-C)** $\rightarrow (□)$

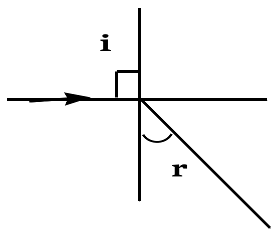
**<u>rarer to denser,</u>**

$i = □□°$

$r = C$

$d = (□ - r) = (□□ - C)$

$d = \frac{\theta}{□} \rightarrow (□)$



117. In a Young's double-slit experiment, the central bright fringe can be identified

□□□□s it has greater intensity than the □ther □right □ringes

□□□□s it is □ider than the □ther □right □ringes

□□□□s it is narr□□er than the □ther □right □ringes

□□□□y □sing □hite □ight instead □□□ □n□□hr□□ ati□ □ight

Key : D

Solution : Central fringe will only be white in colour

118. A narrow stream of electrons of energy 100eV is fired at two parallel slits very close to each other. The distance between the slits is 10A. The electron waves after passing through the slits interfere on a screen, 3m away from slits. The fringe width is

□□□ □□□□□ □□□ □□□□□ □□□ □□□□□ □□□ □□□□□

Key : 1

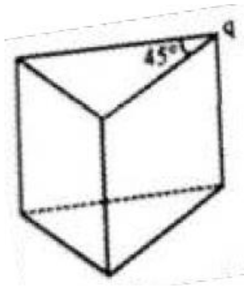
Solution : Wavelength of $e^-$ waves

$$\lambda = \frac{□□□□□}{\sqrt{□}} = □□□□ °$$

Like YDSE, $\beta = \frac{\lambda □}{d}$

$$\beta = \frac{□□ \times □}{□□} = □□□□□$$

119. A prism shaped imaginary structure is given. A point charge 'q' is kept as given in figure. The electric flux passing through the prism is




□□□ $\frac{q}{□ \in_□}$ □□□ $\frac{q}{□ \in_□}$ □□□ $\frac{q}{□□ \in_□}$ □□□ $\frac{q}{□□ \in_□}$

Key : 3

Sol : $360^0/45^0=8$ To enclose the charge one more such set should be placed above it. So total 16 prisms are required.

120. For a closed surface through which the net flux is zero, each of the following four statements *could* be true. Which of the statements *must* be true ?

*a*) There are no charges inside the surface

*b*) The net charge inside the surface is zero

*c*) The electric field is zero everywhere on the surface

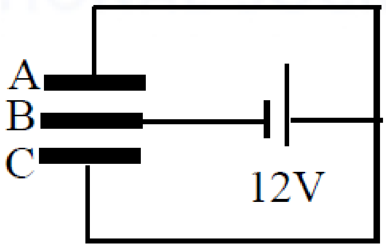
*d*) The number of electric field lines entering the surface equals the number leaving the surface

[illegible] *a*, *c* [illegible] *b*, *d* [illegible] *b*, *c* [illegible] *a*, *d*

**Key : 2**

**Solution : Charges might be there, but net charge is zero inside and [illegible] $\neq$ [illegible] on surface.**

**121.** **Three plates A,B,C each of area [illegible] $cm^2$ have separation 3mm between A and B and 3mm between B and C. The energy stored when the plates are fully charged is**




[illegible] $J$ [illegible] $J$ [illegible] $J$ [illegible] $J$

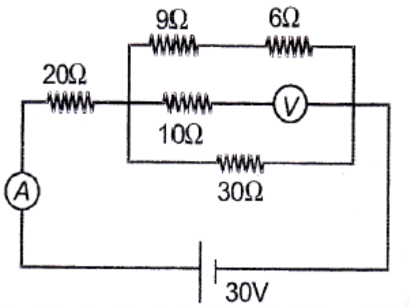
**Key : 2**

**Solution : 2 Capacitors in parallel**

$$U = \frac{1}{2}(2C)V^2$$

$$[illegible] = \left(\frac{\varepsilon_0 A}{d}\right)V^2$$

**122.** **In the circuit shown in figure, if ammeter and voltmeter are ideal, then the power consumed in [illegible] $\Omega$ resistor will be**




[illegible] [illegible] [illegible] [illegible]

**Key : 2**

**Solution : If volt meter ideal**

**R = $\propto$, so no current through volt meter branch.**

$\square_{e\square\square} = \square\square\square\Omega$

$\mathbf{i} = \frac{\square\square}{\square\square} = \square\square$

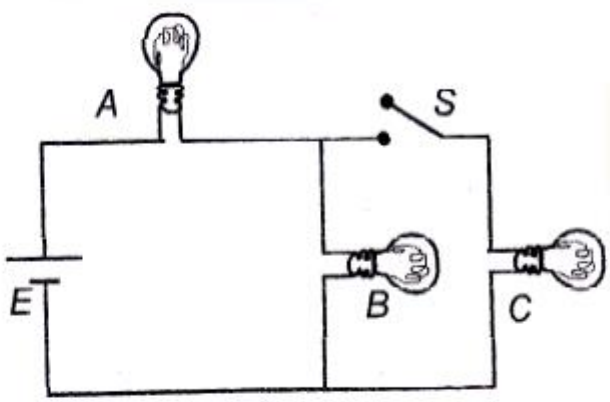
$\square\mathbf{n}\ \square\Omega\ \square\square\mathbf{ran}\square\mathbf{h}\square\ \mathbf{i}_{\square} = \left(\frac{\square\square}{\square\square}\right)\times\square$

$\boxed{\mathbf{i}_{\square} = \frac{\square}{\square}\square}$

**Power is ‘$\square\Omega$, P = $\mathbf{i}_{\square}^{\square}\square\square$**

**P =** $\frac{\square}{\square}\times\square = \boxed{\square\square}$

**123.** **Three identical bulbs are connected as shown in figure. When switch S is closed, the power consumed in bulb B is P. What will be the power consumed by the same bulb when switch S is opened ?**




□□□ $\frac{\square P}{\square}$ □□□ $\frac{\square\square P}{\square}$ □□□ $\frac{\square P}{\square\square}$ □□□ $\frac{\square P}{\square}$

**Key : 1**

**Solution :** **<u>When switch is closed</u>**

$□_{e□} = \frac{□□}{□}$

**Total current, i =** $\frac{□□}{□□}$

**Current in bulb 'B'.** $i_□ = \frac{i}{□}$

$i_□ = \frac{□}{□□}$

**Power of bulb 'B', P =** $i_□^□ □$

**P =** $\frac{□^□}{□□} \rightarrow (□)$

**<u>When switch 'S' opened</u>**

$□_{e□} = □□$

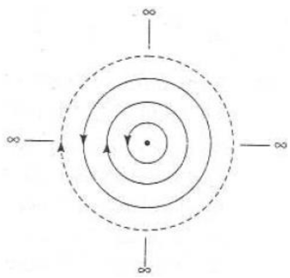
**Total current, i =** $\frac{□}{□□}$

**Power in 'B'.** $P^□ = i^□ □$

$P^□ = \frac{□^□}{□□} \rightarrow (□)$

ss $\frac{P}{P^□} = \frac{□}{□} \Rightarrow \boxed{P^□ = \frac{□P}{□}}$

□□□□ **Infinite conducting rings each having current I in the directions shown are placed concentrically in the same plane as shown in the figure (currents in successive coils are in opposite directions of rings). The radii are** $r□□r□□^□r□□^□r□□□□\infty□$ **The total magnetic induction at their common centre is**




□□□ □er□      □□□ $\frac{\mu_o i}{r}$      □□□ $\frac{\mu_o i}{□r}$      □□□ $\frac{\mu_o i}{□r}$

**Key : 4**

**Solution□** $B_C = \frac{\mu_o I}{2r}$ due to each circular loop

**125. A charged particle moves undeflected in a region of crossed electric and magnetic fields. If the electric field is switched off, the particle has an initial acceleration a. If the magnetic field is switched off, instead of the electric field, the particle will have an initial acceleration**

(1) [illegible] a t [illegible] (2) [illegible] a (3) [illegible] a t [illegible] a (4) [illegible] a

**Key : 3**

**Solution** [illegible] nitia [illegible] r [illegible] es are sa [illegible] e

**126. Into a transverse uniform magnetic field of induction 6.5 G an electron is projected with a speed [illegible] $\times$ [illegible] m/s, at angle [illegible] to the boundary. The time elapsed by the electron in the field in nano second is**

(1) [illegible] (2) [illegible] (3) [illegible] (4) infinity

**Key : 3**

**Solution : It comes out of field after it completes half revolution**

$$t = \frac{\pi r}{?} = \frac{\pi\left(\frac{?}{?}\right)}{?}$$

$$t = \frac{\pi M}{?}$$

**127. In LCR circuit current resonant frequency is 600Hz and half power points are at 650 Hz and 550Hz. The quality factor is**

(1) [illegible] (2) [illegible] (3) [illegible] (4) [illegible]

**Key : 3**

**Solution : Q =** $\frac{\omega}{\Delta\omega}$

$= \frac{???}{???} = ?$

**128. A capacitor of capacitance C is given charge Q and then connected in parallel to a coil of inductance L. There is no resistance in the circuit. When the charge on the capacitor becomes zero, the current in the coil will be**

(1) $Q\sqrt{\frac{L}{C}}$ (2) $\frac{Q}{\sqrt{LC}}$ (3) $Q\sqrt{\frac{C}{L}}$ (4) [illegible] er [illegible]

**Key : 2**

**Solution :** $\frac{Q^{?}}{?C} = \frac{?}{?} LI^{?}$ (by [illegible] nservati [illegible] n [illegible] energy)

**129. In a uniform magnetic field of** $10^{-?}T$ **in free space, the energy density is** ***u*****. The electric field which will produce the same energy density in free space is**

□□□ □□□$^{□}V$ □$m$ □□□ □$\times$□□$^{□}V$ □$m$ □□□ □□$V$ □$m$ □□□ □$\times$□□$^{-□}V$ □$m$

**Key : 2**

**Solution:** $U = \frac{□}{□} \in_□ E^□ = \frac{B^□}{□\mu_□}$ **and** $C = \frac{□}{\sqrt{\in_□ \mu_□}}$

**130. A bar magnet is demagnetized by inserting it inside a solenoid of length 0.2m, 100 turns, and carrying a current of 5.2 A. The coercivity of the bar magnet is:**

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**Key : 2**

**Solution:** $B = \mu_□ nI$

$H = nI$

**131. An example of a perfect diamagnet is a superconductor. This implies that when a superconductor is put in a magnetic field of induction B, the magnetic field $B_S$ inside the superconductor will be such that:**

□□□ $B_s = -B$ □□□ $B_S = □$ □□□ $B_S = B$ □□□ $B_S < B$ □□**t** $B_S \neq □$

**Key : 2**

**Solution ;** For super conductors, $x = -1$ Since $\mu_r = 1 + x$ $\Rightarrow \mu_r = 0$

**□□□□ A small ball is projected with initial speed u and at an angle $\theta$ with horizontal from ground. The de – Broglie wave length of ball at the moment its velocity vector becomes perpendicular to initial velocity vector is**

□□□ $\frac{h}{mu}$ □□□ $\frac{h}{mu\,\mathbf{sin}\theta}$ □□□ $\left(\frac{h}{mu}\right)\mathbf{tan}\theta$ □□□ $\frac{h}{mu\,□□\mathbf{s}\theta}$

**Key : 3**

**Solution: The velocity of projectile when its initial velocity is perpendicular to final vector is**

$v = u\cot\theta$ de-Broglie wave length $\lambda = \frac{h}{mv}$

$\lambda = \frac{h}{mu\cot\theta}$ $\lambda = \left(\frac{h}{mu}\right)\tan\theta$

**133. An energy of 24.6 eV is required to remove one of the electrons from a neutral helium atom. The energy (in eV) required to remove both the electrons from a neutral helium atom is**

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**Key : 4**

**Solution :** $E = -13.6 \times \frac{Z^2}{n^2}$

**Z = 2**

**134. An electron (mass m) with an initial velocity $\mathbf{v} = v_0\hat{\mathbf{i}}$ is in an electric field $\vec{E} = E_0\hat{j}$. If initial wavelength $\lambda_0 = h/mv_0$, then its de Broglie wavelength at time t is given by**

(1) $\lambda_0$ (2) $\lambda_0\sqrt{1+\frac{e^2E_0^2t^2}{m^2v_0^2}}$ (3) $\frac{\lambda_0}{\sqrt{1+\frac{e^2E_0^2t^2}{m^2v_0^2}}}$ (4) $\frac{\lambda_0}{\sqrt{1+\frac{e^2t}{m v_0}}}$

**Key : 3**

**Solution :** $V = u + at$

$$= V_o\hat{i} - \frac{e}{m}E_o t\hat{j}$$

$$V = \sqrt{V_o^2 + \frac{e^2E_o^2t^2}{m^2}}$$

$$\lambda = \frac{h}{mv}$$

$$= \frac{h}{m\sqrt{V_0^2\left(1+\frac{e^2E_0^2t^2}{mv^2}\right)}}$$

$$= \frac{h}{mv_o\sqrt{1+\frac{e^2E_0^2t^2}{m^2V_0^2}}}$$

$$= \frac{\lambda_o}{\sqrt{1+\frac{e^2E_0^2t^2}{m^2V_0^2}}}$$

**135. At $t = 0$, a radioactive substance has a mass $m$. Its half-life is 10 minutes. When $t = t_1$, the amount of substance disintegrated is $m/5$ and when $t = t_2$, the amount of substance disintegrated is $3m/5$. Then the time interval ($t_2 - t_1$) is**

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**Key : 1**

**Solution : At $t_{\square}$ remaining mass $\frac{\square\square M\square}{\square}$**

**At $t_{\square}$ remaining mass $\frac{\square\square M\square}{\square}$**

**In time interval $(t_{\square} - t_{\square})$ it is reduced to half.**

$(t_{\square} - t_{\square}) = \square = \square\square\ \square$ **in**.

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## NEET GRAND TEST-7

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□□□□ Holme’s signals can be obtained by using

□□□ $\mathbf{CaC_{□} + CaC□_{□}}$ □□□ $\mathbf{CaC_{□} + Ca_{□}P_{□}}$

□□□ $\mathbf{CaC_{□} + CaC□_{□}}$ □□□ $\mathbf{Ca_{□}P_{□} + CaC□_{□}}$

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**S□□ti□n□** $\mathbf{CaC_{□} + Ca_{□}P_{□}}$ used in the Holme’s signals.

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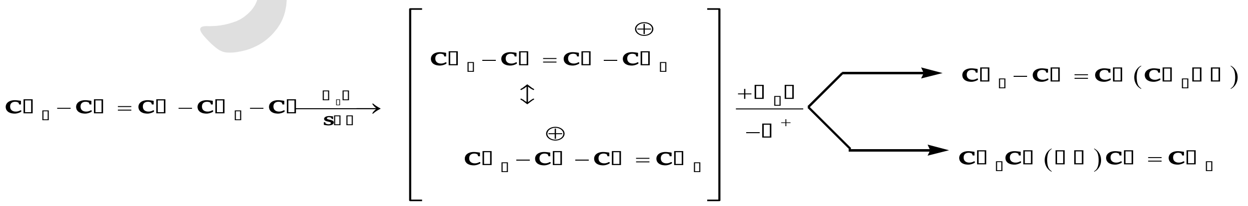

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Sti n + → + + +

 Neils Bohr's atomic model is not appi a e t

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Sti n Bohr's atomic model is applicable to Hydrogen and hydrogen like ions

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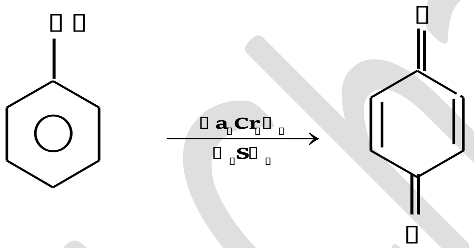
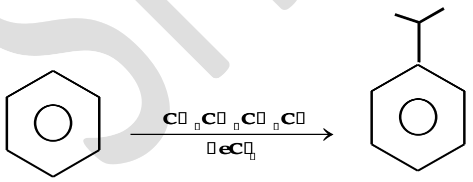


 $(C)C \xrightarrow{Mn^{+}} (C)C$



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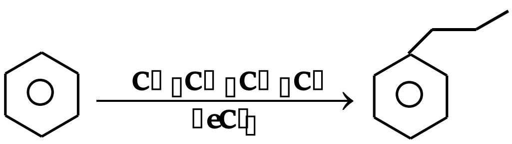

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□□□ $\left[C□\left(□_{□}□\right)_{□}\right]^{+□}$ and $\left[□h\left(□_{□}□\right)_{□}\right]^{+□}$ □□□ $\left[C□\left(□_{□}□\right)_{□}\right]^{+□}$ and $\left[C□\left(□_{□}□\right)_{□}\right]^{+□}$

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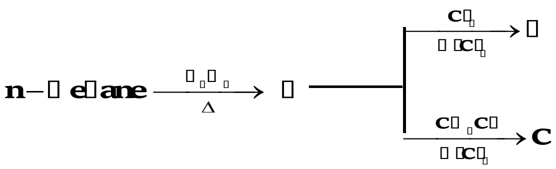


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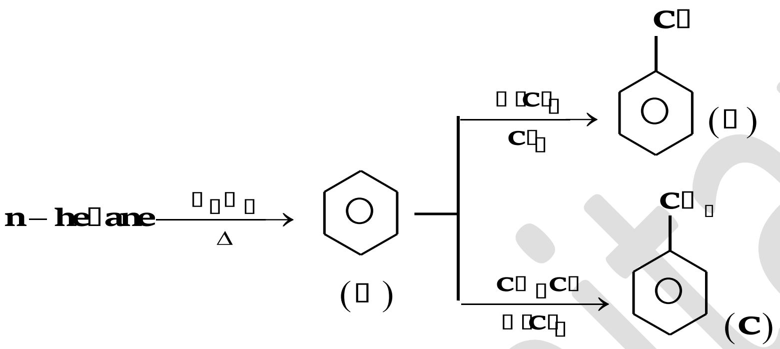


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S□□ti□n□□□□Amines react with Heinsberg's reagent to give sulphanamide which is insoluble in NaOH□

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$$□Cr_{□s□} + \frac{□}{□}□_{□□g□} \rightarrow Cr_□□_{□□g□}□\Delta□ = -□□□□□□$$

$$C_{□s□} + \frac{□}{□}□_{□□g□} \rightarrow C□_{□g□}□\Delta□ = -□□□□□$$

□ hat is the entha□py □hange □in□□□ □□r the rea□ti□n□

□C□s□□ Cr□□□(s) $\rightarrow$ 2Cr(s) + 3CO(g)

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S□□ Heat change of a reaction = $\Delta$H = (Sum of the Heats of formation of products)□□S□□ □□the □eats□□□□r□ati□n□□rea□tants□

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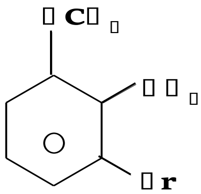
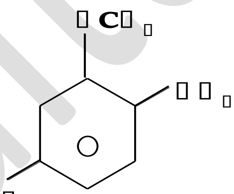
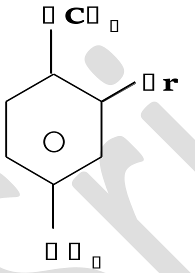
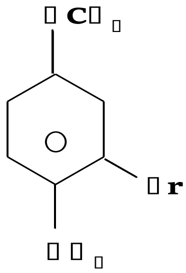
**□□□□ □nis□□e is s□□□e□ted t□ nitrati□n t□ give** ‘x’ as major product. ‘X’ on bromination gives ‘Y’ as major product then ‘Y’ is

□□□ 

□□□ 

□□□ 

□□□ 

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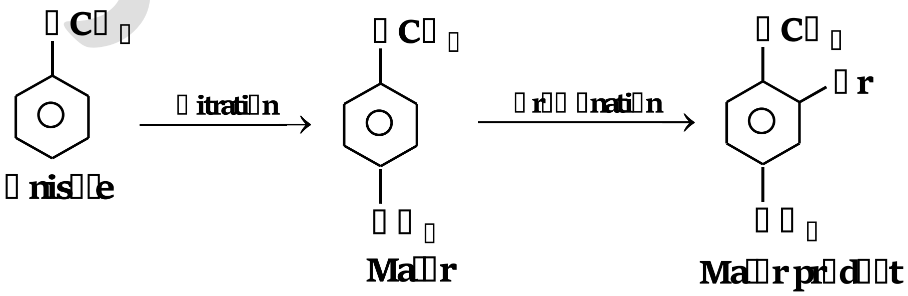


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**□□□□ □en□□i□ a□id □P□a □ □□□□ is**

(A) Strong acid (B) Moderately strong acid

(C) Weak acid (D) Extremely weak acid

Key: [illegible]

Solution: Acids having pKa value between [illegible] to [illegible] are moderately strong acids.

[illegible]. Which of the following is a globular protein

(A) Keratin (B) Insulin (C) Myosin (D) Both [illegible] and [illegible]

Key: [illegible]

Solution: Insulin is a globular protein.

[illegible]. $13^{th}$ group element with least melting point is

(A) Ga (B) [illegible]

(C) In (D) [illegible]

Key: [illegible]

Solution: Ga has least melting point among $13^{th}$ group elements.

[illegible]. [illegible] dibromopropane on treatment with 'x' moles of $NaNH_2$ followed by treatment with $CH_3CH_2Br$ gives a pentyne. The value of 'x' is

(A) [illegible] (B) [illegible] (C) [illegible] (D) [illegible]

Key: [illegible]

Solution:

$$CH_3-\underset{Br}{CH}-\underset{Br}{CH_2}\xrightarrow[-HBr]{NaNH_2}CH_3-\underset{Br}{C}=CH_2\xrightarrow[-HBr]{NaNH_2}CH_3-C\equiv CH\xrightarrow{NaNH_2}$$

$$CH_3-C\equiv C-CH_2-CH_3\xleftarrow{C_2H_5Br}CH_3-C\equiv C-Na$$

[illegible]