JEE (Main) PHYSICS SOLVED PAPER

2023
24^{th} Jan Shift 2

General Instructions :

1. *In Physics Section, there are 30 Questions (Q. no. 1 to 30).*
2. *In Physics, Section A consists of 20 multiple choice questions & Section B consists of 10 numerical value type questions. In Section B, candidates have to attempt any five questions out of 10.*
3. *There will be only one correct choice in the given four choices in Section A. For each question for Section A, 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice questions and zero mark will be awarded for not attempted question.*
4. *For Section B questions, 4 marks will be awarded for correct answer and zero for unattempted and incorrect answer.*
5. *Any textual, printed or written material, mobile phones, calculator etc. is not allowed for the students appearing for the test.*
6. *All calculations / written work should be done in the rough sheet is provided with Question Paper.*

Section A

Q. 1. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion: A pendulum clock when taken to Mount Everest becomes fast.

Reason: The value of g (acceleration due to gravity) is less at Mount Everest than its value on the surface of earth.

In the light of the above statements, choose the most appropriate answer from the options given below

(1) Both A and R are correct but R is NOT the correct explanation of A
(2) A is correct but R is not correct
(3) Both A and R are correct and R is the correct explanation of A
(4) A is not correct but R is correct

Q. 2. The frequency (ν) of an oscillating liquid drop may depend upon radius (r) of the drop, density (ρ) of liquid and the surface tension (s) of the liquid as : $\nu = r^{a} \rho^{b} s^{c}$. The values of a, b and c respectively are

(1) $\left(-\frac{3}{2}, \frac{1}{2}, \frac{1}{2}\right)$ **(2)** $\left(\frac{3}{2}, -\frac{1}{2}, \frac{1}{2}\right)$

(3) $\left(-\frac{3}{2}, -\frac{1}{2}, \frac{1}{2}\right)$ **(4)** $\left(\frac{3}{2}, \frac{1}{2}, -\frac{1}{2}\right)$

Q. 3. Given below are two statements:

Statement I : Acceleration due to earth's gravity decreases as you go 'up' or 'down' from earth's surface.

Statement II : Acceleration due to earth's gravity is same at a height 'h' and depth 'd' from earth's surface, if $h = d$.

In the light of above statements, choose the most appropriate answer from the options given below

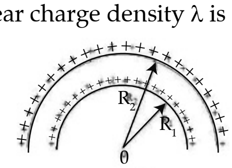
(1) Both Statement I and Statement II are incorrect
(2) Statement I is incorrect but statement II is correct
(3) Both Statement I and II are correct
(4) Statement I is correct but statement II is incorrect

Q. 4. A long solenoid is formed by winding 70 turns cm^{-1} . If 2.0 A current flows, then the magnetic field produced inside the solenoid is __________

$[\mu_0 = 4\pi \times 10^{7}\ TmA^{-1}]$

(1) 88×10^{-4} T **(2)** 352×10^{-4} T
(3) 176×10^{-4} T **(4)** 1232×10^{-4} T

Q. 5. The electric potential at the centre of two concentric half rings of radii R_1 and R_2, having same linear charge density λ is :



(1) $\frac{\lambda}{2\varepsilon_0}$ **(2)** $\frac{\lambda}{4\varepsilon_0}$

(3) $\frac{2\lambda}{\varepsilon_0}$ **(4)** $\frac{\lambda}{\varepsilon_0}$

Q. 6. If the distance of the earth from Sun is 1.5×10^{6} km. Then the distance of an imaginary planet from Sun, if its period of revolution is 2.83 years is :

(1) 6×10^{6} km **(2)** 3×10^{6} km
(3) 3×10^{7} km **(4)** 6×10^{7} km

Q. 7. A photon is emitted in transition from n = 4 to n = 1 level in hydrogen atom. The corresponding wavelength for this transition is (given, h = 4×10^{-15}eVs) :

(1) 99.3 nm (2) 941 nm
(3) 974 nm (4) 94.1 nm

Q. 8. A cell of emf 90 V is connected across series combination of two resistors each of 100Ω resistance. A voltmeter of resistance 400Ω is used to measure the potential difference across each resistor. The reading of the voltmeter will be:

(1) 90 V (2) 45 V
(3) 80 V (4) 40 V

Q. 9. If two vectors $\vec{P} = \hat{i} + 2m\hat{j} + m\hat{k}$ and $\vec{Q} = 4\hat{i} - 2\hat{j} + m\hat{k}$ are perpendicular to each other. Then, the value of m will be:

(1) −1 (2) 3
(3) 2 (4) 1

Q. 10. The electric field and magnetic field components of an electromagnetic wave going through vacuum is described by

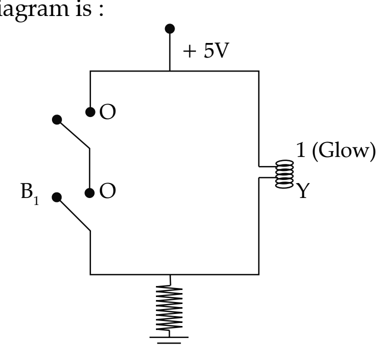
$E_x = E_0 \sin(kz - \omega t)$

$B_y = B_o \sin(kz - \omega t)$

Then the correct relation between E_o and B_o is given by

(1) $E_0 B_0 = \omega k$ (2) $E_0 = kB_0$
(3) $kE_0 = \omega B_0$ (4) $\omega E_0 = kB_0$

Q. 11. The logic gate equivalent to the given circuit diagram is :



(1) NAND (2) OR
(3) AND (4) NOR

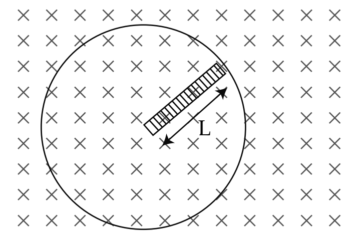
Q. 12. Let γ_1 be the ratio of molar specific heat at constant pressure and molar specific heat at constant volume of a monoatomic gas and γ_2 be the similar ratio of diatomic gas. Considering the diatomic gas molecule as a rigid rotator, the ratio, $\frac{\gamma_1}{\gamma_2}$ is :

(1) $\frac{25}{21}$ (2) $\frac{35}{27}$
(3) $\frac{21}{25}$ (4) $\frac{27}{35}$

Q. 13. When a beam of white light is allowed to pass through convex lens parallel to principal axis, the different colours of light converge at different point on the principle axis after refraction. This is called:

(1) Spherical aberration
(2) Polarisation
(3) Chromatic aberration
(4) Scattering

Q. 14. A metallic rod of length ' L ' is rotated with an angular speed of ' ω ' normal to a uniform magnetic field ' B ' about an axis passing through one end of rod as shown in figure. The induced emf will be:



(1) $\frac{1}{4} B L^2 \omega$ (2) $\frac{1}{2} B^2 L^2 \omega$
(3) $\frac{1}{4} B^2 L \omega$ (4) $\frac{1}{2} B L^2 \omega$

Q. 15. An α-particle, a proton and an electron have the same kinetic energy. Which one of the following is correct in case of their de-Broglie wavelength:

(1) $\lambda_a < \lambda_p < \lambda_e$ (2) $\lambda_a = \lambda_p = \lambda_e$
(3) $\lambda_a > \lambda_p > \lambda_e$ (4) $\lambda_a > \lambda_p < \lambda_e$

Q. 16. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason

Assertion A : Steel is used in the construction of buildings and bridges.

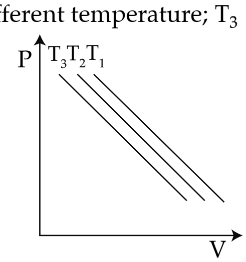
Reason R : Steel is more elastic and its elastic limit is high.

In the light of above statements, choose the most appropriate answer from the options given below

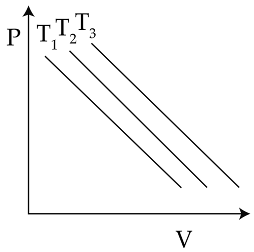
(1) Both A and R are correct and R is the correct explanation of A
(2) Both A and R are correct but R is NOT the correct explanation of A
(3) A is correct but R is not correct
(4) A is not correct but R is correct

Q. 17. In an Isothermal change, the change in pressure and volume of a gas can be represented for three different temperature; $T_3 > T_2 > T_1$ as:

(1)



(2)



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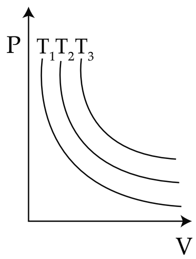
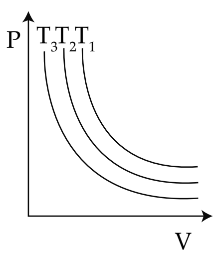


(4)



Q. 18. Match List I with List II

List I		List II	
A.	AM Broadcast	**I.**	88 – 108MHz
B.	FM Broadcast	**II.**	540 – 1600kHz
C.	Television	**III.**	3.7 – 4.2GHz
D.	Satellite Communication	**IV.**	54MHz – 890MHz

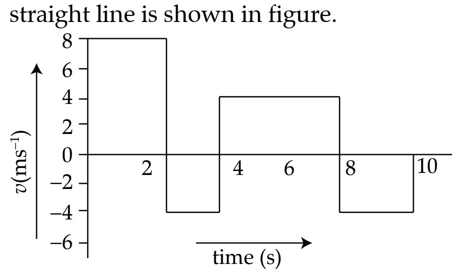
Choose the correct answer from the options given below:

(1) A-II, B-I, C-IV, D-III
(2) A-I, B-III, C-II, D-IV
(3) A-IV, B-III, C-I, D-II
(4) A-II, B-III, C-I, D-IV

Q. 19. A body of mass 200 g is tied to a spring of spring constant 12.5 N/m, while the other end of spring is fixed at point O. If the body moves about O in a circular path on a smooth horizontal surface with constant angular speed 5rad/s. Then the ratio of extension in the spring to its natural length will be :

(1) 2:5 **(2)** 1: 1
(3) 2: 3 **(4)** 1: 2

Q. 20. The velocity time graph of a body moving in a straight line is shown in figure.



The ratio of displacement to distance travelled by the body in time 0 to 10 s is :

(1) 1: 1 **(2)** 1: 2
(3) 1: 3 **(4)** 1: 4

Section B

Q. 21. A body of mass 1 kg begins to move under the action of a time dependent force, $\vec{F} = (t\hat{i} + 3t^2\,\hat{j})$ N where $\hat{i}$ and $\hat{j}$ are the unit vectors along x and y axis. The power developed by above force, at the time $t = 2s$, will be ________ W.

Q. 22. A convex lens of refractive index 1.5 and focal length 18 cm in air is immersed in water. The change in focal length of the lens will be ________ cm

(Given refractive index of water $=\frac{4}{3}$)

Q. 23. The energy released per fission of nucleus of ^{240}X is 200MeV. The energy released if all the atoms in 120 g of pure ^{240}X undergo fission is ______ $\times 10^{25}$MeV (Given $N_A = 6 \times 10^{23}$)

Q. 24. A uniform solid cylinder with radius R and length L has moment of inertia I_1, about the axis of the cylinder. A concentric solid cylinder of radius $R' = \frac{R}{2}$ and length $L' = \frac{L}{2}$ is carved out of the original cylinder. If I_2 is the moment of inertia of the carved out portion of the cylinder then $\frac{I_1}{I_2}$ = _______ (Both I_1 and I_2 are about the axis of the cylinder)

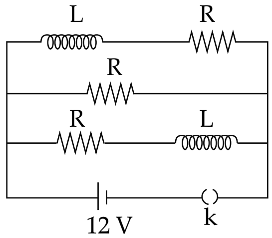
Q. 25. A parallel plate capacitor with air between the plate has a capacitance of 15pF. The separation between the plate becomes twice and the space between them is filled with a medium of dielectric constant 3.5. Then the capacitance becomes $\frac{x}{4}$ pF. The value of x is ________

Q. 26. A single turn current loop in the shape of a right angle triangle with sides 5 cm, 12 cm, 13 cm is carrying a current of 2 A. The loop is in a uniform magnetic field of magnitude 0.75 T whose direction is parallel to the current in the 13 cm side of the loop. The magnitude of the magnetic force on the 5 cm side will be $\frac{x}{130}$ N. The value of x is __________

Q. 27. A mass m attached to free end of a spring executes SHM with a period of 1 s. If the mass is increased by 3 kg the period of oscillation increases by one second, the value of mass m is _____ kg.

Q. 28. If a copper wire is stretched to increase its length by 20%. The percentage increase in resistance of the wire is _________ %

Q. 29. Three identical resistors with resistance R = 12Ω and two identical inductors with self inductance L = 5mH are connected to an ideal battery with emf of 12 V as shown in figure. The current through the battery long after the switch has been closed will be ________ A.



Q. 30. A Spherical ball of radius 1 mm and density 10.5 g/cc is dropped in glycerine of coefficient of viscosity 9.8 poise and density 1.5 g/cc. Viscous force on the ball when it attains constant velocity is 3696×10^{-x} N. The value of x is (Given, $g = 9.8$ m/s ^{2} and $\pi = \frac{22}{7}$)

❑❑❑

Answer Key

Q. No.	Answer	Topic Name	Chapter Name
1	4	Time Period of Simple Pendulum	Oscillations
2	3	Dimensions	Units and Measurements
3	4	Variation in Acceleration Due to Gravity	Gravitation
4	3	Solenoid	Moving Charges and Magnetism
5	1	Electric Potential due to Continuous Charge Distribution	Electrostatic Potential and Capacitance
6	2	Kepler's Law	Gravitation
7	4	Line Spectrum of Hydrogen	Atoms
8	2	Ohm's Law	Current Electricity
9	3	Vectors	Mathematical Tools
10	3	Representation of EMW	Electromagnetic Waves
11	3	Logic Gates	Communication Systems
12	1	Specific Heats	Thermodynamics
13	3	Refractive Index	Ray Optics
14	4	Motional EMF	Electromagnetic Induction
15	1	de-Broglie Relation	Dual Nature of Radiation and Matter
16	1	Elasticity	Mechanical Properties of Solids
17	3	Ideal Gas Equation	Kinetic Theory of Gases
18	1	Bandwidth of Signals	Communication Systems
19	3	Rotational Motion	System of Particle and Rotational Motion
20	3	Graphical Representation of Motion	Motion in a Line
21	[100]	Power	Work, Energy and Power
22	[54]	Lens Maker's Formula	Ray Optics
23	[6]	Nuclear Fission	Nuclei
24	[32]	Moment of Inertia	System of Particle and Rotational Motion
25	[105]	Parallel Plate Capacitor	Electrostatic Potential and Capacitance
26	[9]	Force on Current Carrying Wire Placed in Magnetic Field	Moving Charges and Magnetism
27	[1]	SHM	Oscillations
28	[44]	Resistivity	Current Electricity
29	[3]	Electric Circuit	Current Electricity
30	[7]	Terminal Velocity/ Stoke's Law	Fluid Mechanics

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ANSWERS WITH EXPLANATIONS

Section A

1. **Option (4) is correct.**

As height increases, g decreases. So statement II is true.

Time period of simple pendulum, $T = 2\pi\sqrt{\frac{l}{g}}$

or $T \propto \frac{1}{\sqrt{g}}$, On Everest as g is less than g at surface So, time period of pendulum will increase. So statement I is false.

2. **Option (3) is correct.**

Given, $v = r^a \rho^b s^c$

$$[T^{-1}] = [L]^a[M^1L^{-3}]^b[M^1T^{-2}]^c$$

$$[M^0L^0T^{-1}] = [M^{b+c}L^{a-3b}T^{-2c}]$$

On comparing dimensions of both sides,

$$-2c = -1 \qquad \Rightarrow c = -\frac{1}{2}$$

$$b+c = 0$$

$$\Rightarrow b = -c = -\frac{1}{2}$$

$$a-3b = 0$$

$$\Rightarrow a = 3b \qquad \Rightarrow a = -\frac{3}{2}$$

3. **Option (4) is correct.**

Acceleration due to gravity decrease as we go up or down from the surface, but decrease in gravity with height is more or faster as compare with depth.

4. **Option (3) is correct.**

$$B = \mu_0 ni \text{ (For a solenoid)}$$

$$B = 4\times\frac{22}{7}\times10^{-7}\times70\times100\times2 = 176\times10^{-4}\text{T}$$

5. **Option (1) is correct.**

Electric potential due to circular arc (linear charge)

$$V_C = V_1+V_2$$

$$\Rightarrow = K\frac{q_1}{r_1}+K\frac{q_2}{r_2}$$

$$\Rightarrow \frac{1}{4\pi\varepsilon_0}\frac{\lambda\pi R_1}{r_1}+\frac{1}{4\pi\varepsilon_0}\frac{\lambda\pi R_2}{r_2} = \frac{\lambda}{2\varepsilon_0}$$

6. **Option (2) is correct.**

According of Kepler's law, $T^2 \propto R^3$

$$\Rightarrow \left(\frac{T_e}{T_p}\right)^2 = \left(\frac{R_e}{R_p}\right)^3$$

$$\Rightarrow \left(\frac{1}{2.83}\right)^2 = \left(\frac{1.5\times10^6}{R_p}\right)^3$$

$$\Rightarrow R_p = 1.5\times10^6\times2.83^{\frac{3}{2}}$$

$$\Rightarrow R_p = 3\times10^6\text{km}$$

7. **Option (4) is correct.**

Here, $n_1 = 1$ $n_2 = 4$

$$E_4 = -\frac{13.6}{n^2} = -\frac{13.6}{16} = -0.85\text{eV}$$

$$E_1 = -\frac{13.6}{n^2} = -\frac{13.6}{1} = -13.6\text{eV}$$

Now $\quad E_4 - E_1 = \frac{hc}{\lambda}$

$$\Rightarrow 0.85-(-13.6) = \frac{(4\times10^{15}\times3\times10^8\times10^9)}{\lambda}$$

$$\Rightarrow \lambda = 94.1 \text{ nm}$$

8. **Option (2) is correct.**

Both resistors have same value so, voltage supplied will be equally divided across two resistors. Resistance of voltmeter will have no impact here, as it gets connected in parallel with resistors.

9. **Option (3) is correct.**

As vectors are perpendicular, $\vec{P}.\vec{Q} = 0$

$$\Rightarrow 2m\hat{j}+m\hat{k}).(4\hat{i}-2\hat{j}+m\hat{k}) = 0$$

$$\Rightarrow 1\times4 + 2m\times-2 + m\times m = 0$$

$$\Rightarrow m^2 - 4m + 4$$

$$\Rightarrow m = 2$$

10. **Option (3) is correct.**

Since the relation between the electric and magnetic field is given as= $\frac{E_0}{B_0} = \frac{\omega}{k}$

11. **Option (1) is correct.**

We can see two switches are in series, so given circuit will behave as either AND or NAND gate.

Now if we see, there is earthing, so if switches are open then also blub will glow. If both switches are closed, there will be a short circuit condition, so bulb won't glow. Hence, given circuit is NAND gate.

12. **Option (1) is correct.**

For monoatomic gas $\quad \gamma_1 = \frac{5}{3} = 1.6$

For diatomic gas $\quad \gamma_2 = \frac{7}{5} = 1.4$

$$\Rightarrow \frac{\gamma_1}{\gamma_2} = \frac{\frac{5}{3}}{\frac{7}{5}} = \frac{25}{21}$$

13. **Option (3) is correct.**

When a ray of white light pass through convex lens, different colors of light converges at different points on the principle axis after refraction. This is due to the difference in refractive index for different colors.

14. Option (4) is correct.

Motional emf is given by, $\int_0^L B\omega x\, dx$

$$\Rightarrow \quad \varepsilon = B\omega \int_0^L x\, dx$$

$$\Rightarrow \quad \varepsilon = B\omega \left[\frac{x^2}{2}\right]_0^L = \frac{1}{2} B\omega L^2$$

15. Option (1) is correct.

De-Broglie wavelength is given by, $\lambda = \frac{h}{\sqrt{2mK}}$

If K (kinetic energy) is constant, $\lambda \propto \frac{1}{\sqrt{m}}$

$\because m_\alpha > m_\beta > m_\gamma$

$\because \lambda_\alpha < \lambda_\beta < \lambda_\gamma$

16. Option (1) is correct.

Steel is more elastic and have high strength, so it is used in construction industry.

17. Option (3) is correct.

For an ideal gas,PV = nRT

For isothermal process, $P \propto \frac{1}{V}$, As V increases, P reduces nonlinearly

18. Option (1) is correct.

Usually satellite communication is done through higher frequency bands. It is a data based question.

19. Option (3) is correct.

Centripetal force acting on body, $m\omega^2(l + \Delta l) = k\Delta l$

$$\Rightarrow \quad \frac{l}{\Delta l} = \frac{k}{m\omega^2} - 1$$

$$\Rightarrow \quad \frac{l}{\Delta l} = \frac{12.5}{0.2 \times 25} - 1 = \frac{3}{2}$$

$$\Rightarrow \quad \frac{\Delta l}{l} = \frac{2}{3}$$

20. Option (3) is correct.

Area under v-t gives displacement, distance

Displacement = 8 × 2 - 4 × 2 + 4 × 4 -2 × 4 = 16m

Distance = 8 ×2 + 4×2 + 4×4 +2×4 = 48 m

⇒ Displacement : Distance = 1 : 3

Section B

21. The correct answer is [100]

$$\vec{v} = \int \frac{F}{m} dt$$

$$\Rightarrow \quad \vec{v} = \int \frac{(t\hat{i} + 3t^2\hat{j})}{m} dt$$

$$\Rightarrow \quad \vec{v} = \int_0^2 t\, dt\, \hat{i} + \int_0^2 3t^2\, dt\, \hat{j} \qquad [\because m = 1]$$

Power, $p = \vec{F}.\vec{v} = \left(t\hat{i} + 3t^2\hat{j}\right) \cdot \left(\frac{t^2}{2}\hat{i} + t^3\hat{j}\right)$

$$\Rightarrow \quad P = \frac{t^3}{2} + 3t^5$$

$$\Rightarrow \quad P = \frac{8^2}{2} + 3 \times 32 = 100$$

22. The correct answer is [54]

From lens maker's formula, $\frac{1}{f} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

In air, $\frac{1}{18} = (1.5\text{-}1)\,\frac{2}{R}$ ....(i)

In water , $\frac{1}{f} = \left(\frac{1.5}{\frac{4}{3}} - 1\right)\left(\frac{2}{R}\right) = \frac{1}{8}\left(\frac{2}{R}\right) = \frac{1}{4R}$ .....(ii)

On dividing (i) by (ii)

On $\frac{f}{18} = \frac{0.5}{0.5/4}$

⇒ Focal length in water, f = 18 × 4 = 72cm

⇒ Change in focal length = 72 – 18 = 54 cm

23. The correct answer is [6]

Energy released on fission of 1 nucleus, 200MeV

Total number of nuclei = $\frac{120}{240} \times 6\times10^{23} = 3\times10^{23}$

Total energy released = $3 \times 10^{23} \times 200 = 6\times10^{25}$ MeV

24. The correct answer is [32]

$I_1 = \frac{MR^2}{2}$ (MI, axis of cylinder)

Mass of cylinder of radius R, $M = \rho\pi R^2$

Mass of carved out cylinder , $M' = \rho V'$

$\Rightarrow M' = \rho\pi \left(\frac{R}{2}\right)^2 \times \frac{L}{2}$

$\Rightarrow M' = \frac{M}{8}$

MI of carved out cylinder, $I_2 = \frac{M'R'^2}{2}$

$$\Rightarrow I_2 = \frac{\frac{M}{8} \times \left(\frac{R}{2}\right)^2}{2} = \frac{1}{32}\frac{MR^2}{2}$$

$\Rightarrow I_1 : I_2 = 32:1$

25. The correct answer is [105]

In air, capacitance $\quad C = \frac{\varepsilon_0 A}{d}$

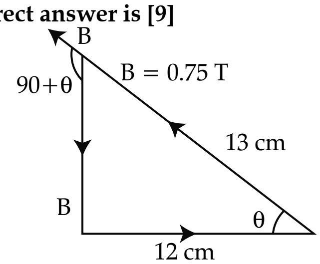
In dielectric $\quad C' = K\frac{\varepsilon_0 A}{2d}$

$$\Rightarrow \quad C' = K\frac{C}{2}$$

$$\Rightarrow \quad C' = 3.5 \times \frac{15}{2} = \frac{105\text{pF}}{4}$$

On comparing with $\frac{x}{4}$ pF, we get x = 105

26. The correct answer is [9]



$$\vec{F} = i\left(\vec{dl} \times \vec{8}\right)$$

$\Rightarrow \quad 2 \times 5 \times 10^{-2} \times 0.75 \times \sin(90 + \theta)$

$\Rightarrow \quad = 0.075 \times \frac{12}{13} \qquad [\because \sin(90 + \theta) = \cos\theta]$

$\Rightarrow \quad = \frac{9}{130}$

On comparing with, , $\frac{x}{130}$, we get x = 9

27. The correct answer is [1]

Time period of simple pendulum, T = $2\pi\sqrt{\frac{m}{k}}$

$T = 2\pi\sqrt{\frac{m}{k}} = 1 \qquad \text{.......(i)}$

Now, $\quad T = 2\pi\sqrt{\frac{m+3}{k}} = 2 \qquad \text{......(ii)}$

On dividing (ii) by (i), we get $\sqrt{\frac{m+3}{m}} = 2$

On squaring both sides, m+3= 4m

$\Rightarrow \quad m = 1 \text{ kg}$

28. The correct answer is [44]

As length becomes 1.2 times, area will become $\frac{1}{1.2}$

$R' = \rho \times \frac{1.2l}{\frac{A}{1.2}} = 1.2^2 \rho^2 \frac{l}{A} = 1.44R$

It means resistance is increasing by 44%.

29. The correct answer is [3]

Long after closing the switch, inductors will not oppose change in current and will act like short circuit. So, all three resistors will be in parallel.

$R_{eq} = 12\,||12||\,12 = \frac{12}{3} = 4\Omega$

As per ohm's law, $I = \frac{V}{R} = \frac{12}{4} = 3A$

30. The correct answer is [7]

Terminal velocity, $v_T = \frac{2}{9}\frac{r^2(\rho - \sigma)g}{n}$

$\Rightarrow \quad v_T = \frac{2}{9}\frac{10^{-6} \times (10.5 - 1.5) \times 10^3 \times 9.8}{9.8 \times 0.1}$

$\Rightarrow \quad v_T = 2\times10^{-2}\ ms^{-1}$

Viscose force, F = $6\pi\eta r v$

$\Rightarrow \quad F = 6 \times \frac{22}{7} \times 9.8 \times 0.1 \times 10^{-3} \times 2 \times 10^{-2}$

$\Rightarrow \quad F = 3696 \times 10^{-7}$

On comparing with 3696×10^{-x}, we get $x = 7$

❐❐❐