JEE Main Physics
Sample Paper – 6

Duration: 60 Minutes | Maximum Marks: 100

Instructions

- **Section A** contains 20 Multiple Choice Questions (Q1–Q20). Each question has four options with only one correct answer. Correct answer: **+4** marks; Wrong answer: **−1** mark; Unattempted: **0** marks.
- **Section B** contains 10 Numerical Value Questions (Q21–Q30). Attempt **any 5** questions. Correct answer: **+4** marks; Wrong or unattempted: **0** marks (no negative marking).
- The syllabus is based on Class 11 & 12 NCERT Physics as per the JEE Main official syllabus.
- Use of personal calculators, log tables, and electronic devices is strictly prohibited.
- A simple on-screen virtual calculator is provided in the CBT interface.
- Rough work may be done in the space provided within the question paper. Do not write anything on the Answer Sheet that is not required.

SECTION A (Single Correct MCQ) Q1 – Q20 [+4 / −1]

Q1. An object is dropped from rest from a height $h = 80\ \text{m}$. Taking $g = 10\ \text{m/s}^2$, the speed of the object just before it reaches the ground is:

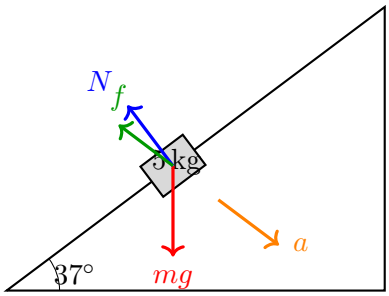
(A) $20\ \text{m/s}$

(B) $40\ \text{m/s}$

(C) $60\ \text{m/s}$

(D) $80\ \text{m/s}$

Q2. A block of mass $5\ \text{kg}$ slides down a rough inclined plane making an angle of 37° with the horizontal. The coefficient of kinetic friction is $\mu_k = 0.5$. Take $\sin 37^\circ = 0.6$, $\cos 37^\circ = 0.8$, $g = 10\ \text{m/s}^2$. The acceleration of the block down the incline is:



(A) $4\ \text{m/s}^2$

(B) $6\ \text{m/s}^2$

(C) $2\ \text{m/s}^2$

(D) $8\ \text{m/s}^2$

Q3. A ball of mass $3\ \text{kg}$ is dropped from a height $H = 5\ \text{m}$ ($g = 10\ \text{m/s}^2$). The kinetic energy of the ball just before it hits the ground is:

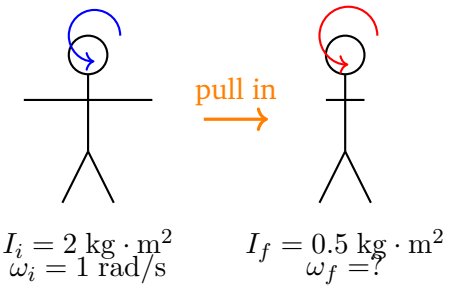
(A) $50\ \text{J}$

(B) $75\ \text{J}$

(C) $100\ \text{J}$

(D) $150\ \text{J}$

Q4. A figure skater spinning on frictionless ice reduces her moment of inertia from $I_i = 2\ \text{kg} \cdot \text{m}^2$ (arms outstretched) to $I_f = 0.5\ \text{kg} \cdot \text{m}^2$ (arms pulled in). Her initial angular velocity is $\omega_i = 1\ \text{rad/s}$. What is her final angular velocity?



(A) $4\ \text{rad/s}$

(B) $2\ \text{rad/s}$

(C) $0.25\ \text{rad/s}$

(D) $8\ \text{rad/s}$

Q5. Two masses m and $4m$ are placed $3\ \text{m}$ apart. At what distance from mass m (along the line joining them) does the gravitational field due to the two masses equal zero?

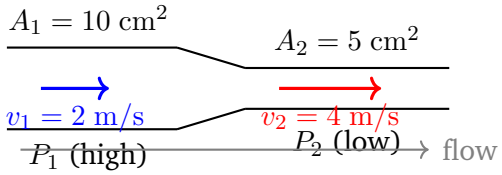
(A) $2\ \text{m}$ from mass m

(B) $1\ \text{m}$ from mass m

(C) $1.5\ \text{m}$ from mass m

(D) $0.5\ \text{m}$ from mass m

Q6. Water flows through a horizontal pipe that narrows from cross-sectional area $A_1 = 10\ \text{cm}^2$ to $A_2 = 5\ \text{cm}^2$. The velocity at the wider section is $v_1 = 2\ \text{m/s}$. Using Bernoulli's equation ($\rho_{\text{water}} = 1000\ \text{kg/m}^3$), the pressure drop $\Delta P = P_1 - P_2$ is:



(A) $3000\ \text{Pa}$

(B) $12000\ \text{Pa}$

(C) $6000\ \text{Pa}$

(D) $1500\ \text{Pa}$

Q7. An ideal gas at constant pressure $P = 2 \times 10^5\ \text{Pa}$ expands from volume $V_1 = 1\ \text{L}$ to $V_2 = 3\ \text{L}$. The work done by the gas in this isobaric process is:

(A) $200\ \text{J}$

(B) $600\ \text{J}$

(C) $100\ \text{J}$

(D) $400\ \text{J}$

Q8. A particle executes simple harmonic motion with amplitude $A = 0.1\ \text{m}$ and time period $T = 0.2\ \text{s}$. The maximum velocity of the particle is:

(A) $\pi\ \text{m/s}$

(B) $2\pi\ \text{m/s}$

(C) $0.5\pi\ \text{m/s}$

(D) $0.1\pi\ \text{m/s}$

Q9. A transverse wave travels along a string under tension $T = 100\ \text{N}$. The linear mass density of the string is $\mu = 0.01\ \text{kg/m}$. The speed of the wave on the string is:

(A) $50\ \text{m/s}$

(B) $100\ \text{m/s}$

(C) $10\ \text{m/s}$

(D) $200\ \text{m/s}$

Q10. A point charge $Q = 3\ \mu\text{C}$ is located in vacuum. The electric potential at a distance $r = 0.3\ \text{m}$ from the charge is: (use $k = 9 \times 10^9\ \text{N} \cdot \text{m}^2/\text{C}^2$)

(A) $3 \times 10^4\ \text{V}$

(B) $3 \times 10^5\ \text{V}$

(C) $9 \times 10^4\ \text{V}$

(D) $9 \times 10^5\ \text{V}$

Q11. Two capacitors $C_1 = 4\ \mu\text{F}$ and $C_2 = 6\ \mu\text{F}$ are connected in series. The equivalent capacitance of the combination is:

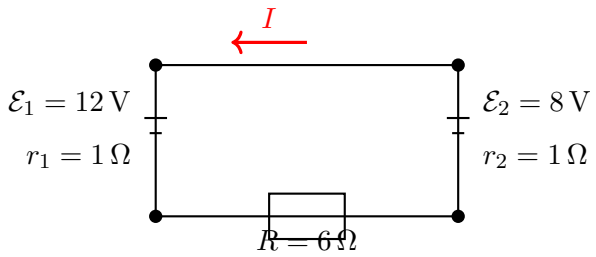
(A) $10\ \mu\text{F}$

(B) $5\ \mu\text{F}$

(C) $1.2\ \mu\text{F}$

(D) $2.4\ \mu\text{F}$

Q12. Two batteries $\mathcal{E}_1 = 12\ \text{V}$ (internal resistance $r_1 = 1\ \Omega$) and $\mathcal{E}_2 = 8\ \text{V}$ (internal resistance $r_2 = 1\ \Omega$) are connected in a single loop opposing each other with an external resistance $R = 6\ \Omega$. The current in the circuit is:



(A) $0.5\ \text{A}$

(B) $1\ \text{A}$

(C) $1.5\ \text{A}$

(D) $2\ \text{A}$

Q13. A solenoid has $n = 1000\ \text{turns/m}$ and carries a current $I = 1\ \text{A}$. The magnetic field inside the solenoid is: (use $\mu_0 = 4\pi \times 10^{-7}\ \text{T} \cdot \text{m/A}$)

(A) $2\pi \times 10^{-4}\ \text{T}$

(B) $4\pi \times 10^{-4}\ \text{T}$

(C) $8\pi \times 10^{-4}\ \text{T}$

(D) $\pi \times 10^{-4}\ \text{T}$

Q14. An inductor of self-inductance $L = 0.2\ \text{H}$ carries a current that changes at a rate $\dfrac{di}{dt} = 5\ \text{A/s}$. The magnitude of the back-EMF induced in the inductor is:

(A) $0.2\ \text{V}$

(B) $0.5\ \text{V}$

(C) $1\ \text{V}$

(D) $2\ \text{V}$

Q15. A series LCR circuit is operating at resonance. The power factor of the circuit at resonance is:

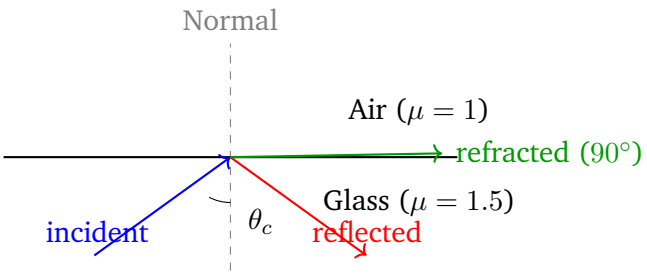
(A) 0

(B) 0.5

(C) $\dfrac{1}{\sqrt{2}}$

(D) 1

Q16. A ray of light travels from glass (refractive index $\mu = 1.5$) to air at a glass–air interface. The critical angle θ_c for total internal reflection is approximately:



(A) 42°

(B) 30°

(C) 60°

(D) 45°

Q17. The work function of a metal is $\phi = 2\ \text{eV}$. When light of frequency f is incident on it, the maximum kinetic energy of the emitted photoelectrons is $2\ \text{eV}$. If light of frequency $2f$ is used instead, the maximum kinetic energy of the emitted photoelectrons is:

(A) $4\ \text{eV}$

(B) $6\ \text{eV}$

(C) 2 eV

(D) 8 eV

Q18. In the Bohr model of the hydrogen atom, the radius of the n-th orbit is $r_n = n^2 \times 0.529$ Å. The radius of the $n = 3$ orbit is:

(A) 1.59 Å

(B) 2.12 Å

(C) 4.77 Å

(D) 0.529 Å

Q19. Which of the following nuclei has the **highest** binding energy per nucleon?

(A) ${}^{2}_{1}\mathrm{H}$

(B) ${}^{4}_{2}\mathrm{He}$

(C) ${}^{238}_{92}\mathrm{U}$

(D) ${}^{56}_{26}\mathrm{Fe}$

Q20. An n-type semiconductor is obtained by doping pure silicon with:

(A) Pentavalent (donor) impurity such as phosphorus or arsenic

(B) Trivalent (acceptor) impurity such as boron or aluminium

(C) Any metal with high conductivity

(D) A tetravalent impurity like carbon

SECTION B (Numerical Value Questions)
Q21 – Q30 Attempt ANY 5 [+4 / 0]

Q21. A spring-mass system consists of a spring of spring constant $k = 200\ \mathrm{N/m}$ and a block of mass $m = 0.5\ \mathrm{kg}$ attached to it. The angular frequency of oscillation ω (in $\mathrm{rad/s}$) is:

(Enter the exact numerical value as your answer.)

Q22. A Carnot engine operates between a hot reservoir at temperature $T_H = 800\ \mathrm{K}$ and a cold reservoir at temperature $T_L = 400\ \mathrm{K}$. Calculate the efficiency of the engine (in %).

(Enter the exact numerical value as your answer.)

Q23. A battery of EMF $\mathcal{E} = 24\ \mathrm{V}$ and internal resistance $r = 2\ \Omega$ is connected to an external resistance $R = 10\ \Omega$. Find the current (in A) flowing through the circuit.

(Enter the exact numerical value as your answer.)

Q24. Two capacitors $C_1 = 6\ \mu\mathrm{F}$ and $C_2 = 3\ \mu\mathrm{F}$ are connected in series. Calculate the equivalent capacitance (in $\mu\mathrm{F}$).

(Enter the exact numerical value as your answer.)

Q25. In a Wheatstone bridge, $P = 2\ \Omega$, $Q = 4\ \Omega$, and $R = 6\ \Omega$. For the bridge to be balanced, find the value of S (in Ω).

(Enter the exact numerical value as your answer.)

Q26. The speed of light in a certain medium is $v = 2 \times 10^8\ \mathrm{m/s}$. The speed of light in vacuum is $c = 3 \times 10^8\ \mathrm{m/s}$. Calculate the refractive index μ of the medium.

(Enter the exact numerical value as your answer.)

Q27. A photon has wavelength $\lambda = 500\ \mathrm{nm}$. Given $c = 3 \times 10^8\ \mathrm{m/s}$, find the frequency of the photon in units of $10^{14}\ \mathrm{Hz}$. (Enter the coefficient only.)

(Enter the exact numerical value as your answer.)

Q28. In the Bohr model of hydrogen, the radii of orbits satisfy $r_n \propto n^2$. Find the ratio r_3/r_1 of the radius of the $n = 3$ orbit to the radius of the $n = 1$ orbit.

(Enter the exact numerical value as your answer.)

Q29. An inductor of inductance $L = 0.4\ \mathrm{H}$ carries a steady current $I = 2\ \mathrm{A}$. The energy stored in the inductor (in J) is:

(Enter the exact numerical value as your answer.)

Q30. A ball is thrown vertically upward with an initial speed $u = 20\ \mathrm{m/s}$ ($g = 10\ \mathrm{m/s^2}$). The total time (in s) taken by the ball to return to the point of projection is:

(Enter the exact numerical value as your answer.)

DETAILED SOLUTIONS

Sol. Q1.

Solution

Topic: Kinematics — Free Fall

For an object dropped from rest, using $v^2 = u^2 + 2gh$ with $u = 0$:

$$v = \sqrt{2gh} = \sqrt{2 \times 10 \times 80} = \sqrt{1600} = \mathbf{40}\ \text{m/s}$$

Final Answer: $40\ \text{m/s} \Rightarrow$ option (B).

Answer: (B)

Sol. Q2.

Solution

Topic: Laws of Motion — Kinetic Friction on Rough Incline

Forces along the incline (taking down the incline as positive):

$$ma = mg\sin\theta - \mu_k mg\cos\theta$$

$$a = g(\sin\theta - \mu_k\cos\theta) = 10(0.6 - 0.5 \times 0.8) = 10(0.6 - 0.4) = 10 \times 0.2 = \mathbf{2}\ \text{m/s}^2$$

Final Answer: $2\ \text{m/s}^2 \Rightarrow$ option (C).

Answer: (C)

Sol. Q3.

Solution

Topic: Work-Energy Theorem — Kinetic Energy in Free Fall

The kinetic energy just before impact equals the loss in potential energy:

$$KE = mgh = 3 \times 10 \times 5 = \mathbf{150}\ \text{J}$$

Final Answer: $150\ \text{J} \Rightarrow$ option (D).

Answer: (D)

Sol. Q4.

Solution

Topic: Rotational Motion — Conservation of Angular Momentum

In the absence of external torque, angular momentum is conserved:

$$L = I_i\omega_i = I_f\omega_f$$

$$\omega_f = \frac{I_i\omega_i}{I_f} = \frac{2 \times 1}{0.5} = \mathbf{4}\ \text{rad/s}$$

Final Answer: 4 rad/s $\Rightarrow$ option (A).

Answer: (A)

Sol. Q5.

Solution

Topic: Gravitation — Neutral Point Between Two Masses

Let the zero-field point be at distance r from mass m and $(3 - r)$ from mass $4m$. Setting the gravitational field magnitudes equal:

$$\frac{Gm}{r^2} = \frac{G(4m)}{(3-r)^2} \implies \frac{(3-r)^2}{r^2} = 4 \implies \frac{3-r}{r} = 2$$

$$3 - r = 2r \implies r = \mathbf{1}\ \text{m from mass } \mathbf{m}$$

Final Answer: 1 m from mass m $\Rightarrow$ option (B).

Answer: (B)

Sol. Q6.

Solution

Topic: Fluid Mechanics — Continuity Equation and Bernoulli's Principle

By the equation of continuity:

$$A_1v_1 = A_2v_2 \implies v_2 = \frac{A_1v_1}{A_2} = \frac{10 \times 2}{5} = 4\ \text{m/s}$$

Applying Bernoulli's equation for horizontal flow:

$$\Delta P = P_1 - P_2 = \frac{1}{2}\rho(v_2^2 - v_1^2) = \frac{1}{2} \times 1000 \times (16 - 4) = 500 \times 12 = \mathbf{6000}\ \text{Pa}$$

Final Answer: 6000 Pa $\Rightarrow$ option (C).

Answer: (C)

Sol. Q7.

Solution

Topic: Thermodynamics — Isobaric Work Done by Gas

For an isobaric (constant pressure) process, the work done by the gas is:

$$W = P\Delta V = P(V_2 - V_1) = 2\times10^5 \times (3-1)\times10^{-3} = 2\times10^5 \times 2\times10^{-3} = \mathbf{400}\ \text{J}$$

Final Answer: 400 J $\Rightarrow$ option (D).

Answer: (D)

Sol. Q8.

Solution

Topic: Simple Harmonic Motion — Maximum Velocity

The angular frequency is:

$$\omega = \frac{2\pi}{T} = \frac{2\pi}{0.2} = 10\pi\ \text{rad/s}$$

The maximum velocity in SHM is:

$$v_{\max} = A\omega = 0.1 \times 10\pi = \pi\ \text{m/s}$$

Final Answer: π m/s $\Rightarrow$ option (A).

Answer: (A)

Sol. Q9.

Solution

Topic: Waves — Speed of Transverse Wave on a String

The speed of a transverse wave on a string is:

$$v = \sqrt{\frac{T}{\mu}} = \sqrt{\frac{100}{0.01}} = \sqrt{10000} = \mathbf{100}\ \text{m/s}$$

Final Answer: 100 m/s $\Rightarrow$ option (B).

Answer: (B)

Sol. Q10.

Solution

Topic: Electrostatics — Electric Potential due to a Point Charge

The electric potential at distance r from a point charge Q is:

$$V = \frac{kQ}{r} = \frac{9 \times 10^9 \times 3 \times 10^{-6}}{0.3} = \frac{27 \times 10^3}{0.3} = \mathbf{9 \times 10^4}\ \text{V}$$

Final Answer: 9×10^4 V $\Rightarrow$ option (C).

Answer: (C)

Sol. Q11.

Solution

Topic: Capacitors — Series Combination

For capacitors in series, the equivalent capacitance is:

$$\frac{1}{C_{\text{eq}}} = \frac{1}{C_1} + \frac{1}{C_2} = \frac{1}{4} + \frac{1}{6} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$$

$$C_{\text{eq}} = \frac{12}{5} = \mathbf{2.4}\ \mu\text{F}$$

Final Answer: $2.4\ \mu$F $\Rightarrow$ option (D).

Answer: (D)

Sol. Q12.

Solution

Topic: Current Electricity — Circuit with Two Opposing EMFs

When two batteries oppose each other in a series loop, the net EMF is the difference and the total resistance is the sum of all resistances:

$$\mathcal{E}_{\text{net}} = \mathcal{E}_1 - \mathcal{E}_2 = 12 - 8 = 4\ \text{V}$$

$$R_{\text{total}} = R + r_1 + r_2 = 6 + 1 + 1 = 8\ \Omega$$

$$I = \frac{\mathcal{E}_{\text{net}}}{R_{\text{total}}} = \frac{4}{8} = \mathbf{0.5}\ \text{A}$$

Final Answer: 0.5 A $\Rightarrow$ option (A).

Answer: (A)

Sol. Q13.

Solution

Topic: Magnetism — Magnetic Field Inside a Solenoid

The magnetic field inside an ideal solenoid is:

$$B = \mu_0 n I = 4\pi \times 10^{-7} \times 1000 \times 1 = 4\pi \times 10^{-4} \text{ T}$$

Final Answer: $4\pi \times 10^{-4}$ T $\Rightarrow$ option (B).

Answer: (B)

Sol. Q14.

Solution

Topic: Electromagnetic Induction — Back-EMF of an Inductor

The magnitude of the back-EMF induced in an inductor is:

$$|\mathcal{E}| = L\left|\frac{di}{dt}\right| = 0.2 \times 5 = \mathbf{1} \text{ V}$$

Final Answer: 1 V $\Rightarrow$ option (C).

Answer: (C)

Sol. Q15.

Solution

Topic: AC Circuits — Power Factor at Resonance

At resonance in a series LCR circuit, the inductive reactance X_L equals the capacitive reactance X_C, so the net reactance is zero. The impedance reduces to $Z = R$, and the current is in phase with the voltage. Therefore:

$$\cos\phi = \frac{R}{Z} = \frac{R}{R} = \mathbf{1}$$

Final Answer: power factor $= 1 \Rightarrow$ option (D).

Answer: (D)

Sol. Q16.

Solution

Topic: Ray Optics — Critical Angle for Total Internal Reflection

At the critical angle, the refracted ray grazes the interface (angle of refraction $= 90°$). Applying Snell's law at the glass–air interface:

$$\mu \sin\theta_c = 1 \times \sin 90° = 1 \implies \sin\theta_c = \frac{1}{\mu} = \frac{1}{1.5} = \frac{2}{3}$$

$$\theta_c = \arcsin\left(\tfrac{2}{3}\right) \approx \mathbf{42}^\circ$$

Final Answer: $\theta_c \approx 42^\circ \Rightarrow$ option (A).

Answer: (A)

Sol. Q17.

Solution

Topic: Dual Nature of Radiation — Photoelectric Effect (Frequency Dependence)

From the first experiment, with light of frequency f:

$$KE_1 = hf - \phi \implies 2\text{ eV} = hf - 2\text{ eV} \implies hf = 4\text{ eV}$$

With light of frequency $2f$:

$$KE_2 = h(2f) - \phi = 2hf - \phi = 2 \times 4 - 2 = 8 - 2 = \mathbf{6}\text{ eV}$$

Final Answer: 6 eV $\Rightarrow$ option (B).

Answer: (B)

Sol. Q18.

Solution

Topic: Atoms — Bohr Orbit Radius

The radius of the n-th Bohr orbit in hydrogen is:

$$r_n = n^2 \times 0.529\text{ Å}$$

For $n = 3$:

$$r_3 = 9 \times 0.529 = 4.761\text{ Å} \approx \mathbf{4.77}\text{ Å}$$

Final Answer: 4.77 Å $\Rightarrow$ option (C).

Answer: (C)

Sol. Q19.

Solution

Topic: Nuclear Physics — Binding Energy per Nucleon

The binding energy per nucleon peaks near iron in the periodic table. Among the given choices:

- ^{2}H: ≈ 1.1 MeV/nucleon

- ^{4}He: ≈ 7.1 MeV/nucleon
- ^{238}U: ≈ 7.6 MeV/nucleon
- ^{56}Fe: ≈ 8.8 MeV/nucleon **(highest)**

Final Answer: $^{56}_{26}$Fe $\Rightarrow$ option (D).

Answer: (D)

Sol. Q20.

Solution

Topic: Semiconductor Physics — n-type Doping

In n-type semiconductors, the dopant provides extra electrons (majority carriers). This is achieved by adding a **pentavalent** (group-15) impurity such as phosphorus (P) or arsenic (As) to pure silicon. The fifth valence electron of the donor atom is not involved in covalent bonding and is free to conduct.

Final Answer: Pentavalent (donor) impurity such as phosphorus or arsenic $\Rightarrow$ option (A).

Answer: (A)

Sol. Q21.

Solution

Topic: Simple Harmonic Motion — Angular Frequency of Spring-Mass System

The angular frequency of a spring-mass system is:

$$\omega = \sqrt{\frac{k}{m}} = \sqrt{\frac{200}{0.5}} = \sqrt{400} = \mathbf{20}\ \text{rad/s}$$

Answer: (20)

Sol. Q22.

Solution

Topic: Thermodynamics — Carnot Efficiency

$$\eta = \left(1 - \frac{T_L}{T_H}\right) \times 100\% = \left(1 - \frac{400}{800}\right) \times 100\% = 0.5 \times 100\% = \mathbf{50}\%$$

Answer: (50)

Sol. Q23.

Solution

Topic: Current Electricity — Current in a Simple Circuit

Using Ohm's law with the total resistance $R_{\text{total}} = R + r$:

$$I = \frac{\mathcal{E}}{R+r} = \frac{24}{10+2} = \frac{24}{12} = \mathbf{2}\ \text{A}$$

Answer: (2)

Sol. Q24.

Solution

Topic: Capacitors — Series Combination

$$\frac{1}{C_{\text{eq}}} = \frac{1}{C_1} + \frac{1}{C_2} = \frac{1}{6} + \frac{1}{3} = \frac{1}{6} + \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$$

$$C_{\text{eq}} = \mathbf{2}\ \mu\text{F}$$

Answer: (2)

Sol. Q25.

Solution

Topic: Current Electricity — Wheatstone Bridge Balance Condition

For a balanced Wheatstone bridge:

$$\frac{P}{Q} = \frac{R}{S} \implies S = \frac{QR}{P} = \frac{4 \times 6}{2} = \frac{24}{2} = \mathbf{12}\ \boldsymbol{\Omega}$$

Answer: (12)

Sol. Q26.

Solution

Topic: Ray Optics — Refractive Index

The refractive index of a medium is defined as the ratio of the speed of light in vacuum to the speed of light in the medium:

$$\mu = \frac{c}{v} = \frac{3 \times 10^8}{2 \times 10^8} = \mathbf{1.5}$$

Answer: (1.5)

Sol. Q27.

Solution

Topic: Dual Nature — Frequency of a Photon

$$f = \frac{c}{\lambda} = \frac{3 \times 10^8}{500 \times 10^{-9}} = \frac{3 \times 10^8}{5 \times 10^{-7}} = 6 \times 10^{14} \text{ Hz}$$

The coefficient is **6** (in units of 10^{14} Hz).

Answer: (6)

Sol. Q28.

Solution

Topic: Atoms — Bohr Orbit Radius Ratio

Since $r_n \propto n^2$:

$$\frac{r_3}{r_1} = \frac{3^2}{1^2} = \frac{9}{1} = \mathbf{9}$$

Answer: (9)

Sol. Q29.

Solution

Topic: Electromagnetic Induction — Energy Stored in an Inductor

The energy stored in an inductor carrying current I is:

$$U = \frac{1}{2}LI^2 = \frac{1}{2} \times 0.4 \times (2)^2 = \frac{1}{2} \times 0.4 \times 4 = \mathbf{0.8} \text{ J}$$

Answer: (0.8)

Sol. Q30.

Solution

Topic: Kinematics — Time of Flight for Vertical Projection

Time to reach the highest point: $t_{\text{up}} = u/g = 20/10 = 2$ s.

By symmetry, the time to fall back to the same level equals the time to rise, so

the total time of flight is:

$$T = \frac{2u}{g} = \frac{2 \times 20}{10} = \mathbf{4}\ \text{s}$$

Answer: (4)

ANSWER KEY

Section A — MCQ Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	C	3	D	4	A	5	B
6	C	7	D	8	A	9	B	10	C
11	D	12	A	13	B	14	C	15	D
16	A	17	B	18	C	19	D	20	A

Section B — Numerical Answer Key

Q	Ans	Q	Ans
21	20	22	50
23	2	24	2
25	12	26	1.5
27	6	28	9
29	0.8	30	4