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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-1

DATE & DAY: 24th January 2026 & Saturday

PAPER-1

Duration: 3 Hrs.
Time: 09:00 – 12:00 IST

SUBJECT: PHYSICS

PART : PHYSICS

1. A spring of stiffness $k = 15\ \text{N/m}$ is cut into a ratio of $3:1$. Find the spring constant of smaller length spring thus formed.

(1) $45\ \text{N/m}$ (2) $60\ \text{N/m}$ (3) $15\ \text{N/m}$ (4) $30\ \text{N/m}$

Ans. (2)

2. EM waves and their source are given

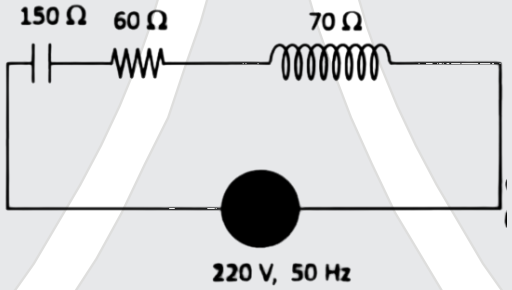
Column - I	Column - II
(a) X-rays	(p) Hot bodies and molecules
(b) Infrared Rays	(q) Oscillatory current in Antenna's
(c) Microwaves	(r) Magnetron
(d) Radio waves	(s) Fast moving electrons striking a metal plate

(1) a - p, b - s, c-r, d-q (2) a-s, b-p, c-r, d-q

(3) a - s, b - p, c -s, d-q (4) a - s, b - r, c - p, d - q

Ans. (2)

3. For the given ac circuit, find the power factor.



(1) 4/5 (2) $3/4$ (3) $4/3$ (4) $3/5$

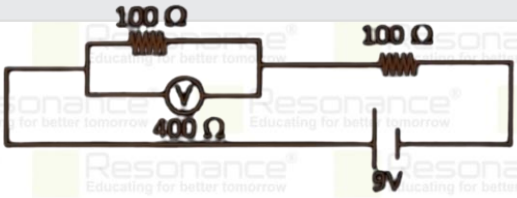
Ans. (4)

4. In H-like atom ratio of speed in two orbits is $3:2$, then ratio of energy is

(1) 5:3 (2) 2:1 (3) 9:4 (4) 2:3

Ans. (3)

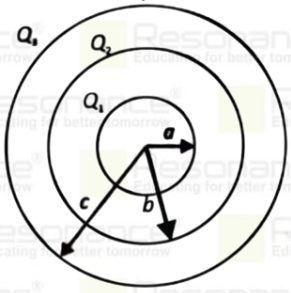
5. A voltmeter of 400 Ω resistance is in parallel with 100 Ω resistor. And the combination is connected with 100 Ω resistor and a battery of 9 volt in series as shown. Find the reading of voltmeter.



(1) 3 volts (2) 5 volts (3) 6 volts (4) 4 volts

Ans. (4)

6. Three uniformly concentric charged shells are kept as shown. Find potential of each shell.



(1) $V_A = \frac{kQ_1}{a} + \frac{kQ_2}{b} + \frac{kQ_3}{c}, V_B = \frac{k(Q_1+Q_2)}{b} + \frac{kQ_3}{c}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

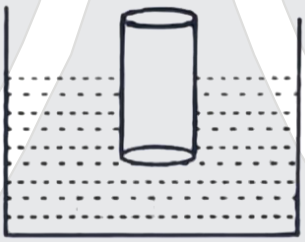
(2) $V_A = \frac{kQ_1}{a} + \frac{kQ_2}{b} + \frac{kQ_3}{c}, V_B = \frac{k(Q_1+Q_2)}{a} + \frac{kQ_2}{b}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

(3) $V_A = \frac{kQ_1}{a} + \frac{kQ_2}{b} + \frac{kQ_3}{c}, V_B = \frac{k(Q_1+Q_2+Q_3)}{b}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

(4) $V_A = \frac{kQ_1}{a} + \frac{k(Q_2+Q_3)}{c}, V_B = \frac{k(Q_1+Q_2)}{b} + \frac{kQ_3}{c}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

Ans. (1)

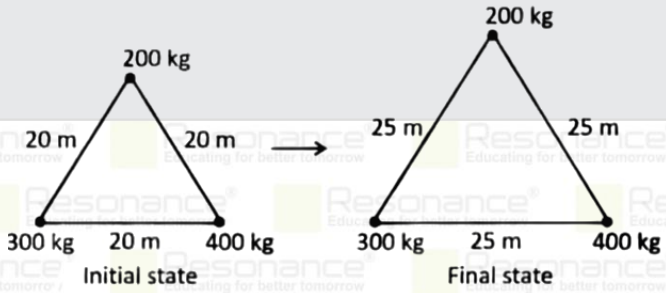
7. A cylindrical block of mass M and area of cross section A is floating in a liquid of density ρ and with its axis vertical. When the block is pushed into the liquid and released the block starts oscillating. Find the time period of oscillation



(1) $T = 2\pi\sqrt{\frac{M}{\rho Ag}}$ (2) $T = 2\pi\sqrt{\frac{\rho Ag}{M}}$ (3) $T = \pi\sqrt{\frac{\rho Ag}{M}}$ (4) $T = \pi\sqrt{\frac{M}{\rho Ag}}$

Ans. (1)

8. Find the work done to change the configuration of the system from initial to final state as shown in the diagram. (Given: $G = 6.67 \times 10^{-11}\ \text{N} - \text{m}^2/\text{kg}^2$)



(1) 2.5232×10^{-7} J (2) 1.7342×10^{-7} J (3) 6.6325×10^{-7} J (4) 1.6253×10^{-7} J

Ans. (2)

9. Three charges $+2q, +2q$ and $-4q$ are situated at $(0, -3a), (2a, 0)$ and $(-2a, 0)$ respectively in the xy plane. The resultant dipole moment about origin is ___ .

(1) $6qa\hat{i} + 12qa\hat{j}$ (2) $12qa\hat{i} + 6qa\hat{j}$ (3) $12qa\hat{i} - 6qa\hat{j}$ (4) $6qa\hat{i} - 12qa\hat{j}$

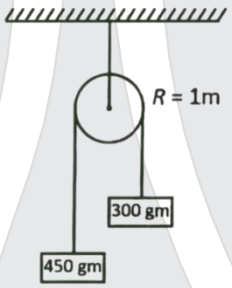
Ans. (3)

10. A dipole is placed in uniform magnetic field $B = 800$ gauss at an angle $30°$ then it experiences the torque of 16×10^{-3} N $-$ m. Find the work done in slowly moving the dipole from stable equilibrium to unstable equilibrium.

(1) 5×10^{-3} J (2) 7.6×10^{-3} J (3) 24.5×10^{-3} J (4) 64×10^{-3} J

Ans. (4)

11. When system is released from rest the heavier mass goes 81 cm in 9 sec, find rotational inertia. $(g = 10\ \text{m/s}^2)$



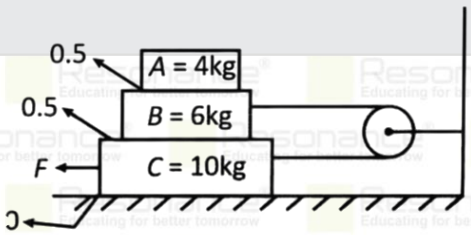
(1) $50.25\ \text{kg} - \text{m}^2$ (2) $25.25\ \text{kg} - \text{m}^2$ (3) $100.25\ \text{kg} - \text{m}^2$ (4) $74.25\ \text{kg} - \text{m}^2$

Ans. (4)

12. **Statement-1 :** Binding energy per nucleon always increase with mass number.
Statement-2 : Binding energy per nucleon for smaller mass number performs nuclear fusion.
(1) Statement-1, false Statement-2, true
(2) Statement-1, true Statement-2, false
(3) Statement-1, false Statement-2, false
(4) Statement-1, true Statement-2, true

Ans. (1)

13. For the given arrangement find the value of F (in Newton) so that body c moves with constant velocity



Ans. (100 N)

14. Match the two Lists given below

List-I		List-II	
a.	Magnetic flux	1.	$M^1 L^2 T^{-2} A^{-2}$
b.	Magnetic permeability	2.	$M^1 L^2 T^{-2} A^{-1}$
c.	Magnetic induction	3.	$M^1 L^1 T^{-2} A^{-2}$
d.	Self induction	4.	$M^1 L^0 T^{-2} A^{-1}$

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

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

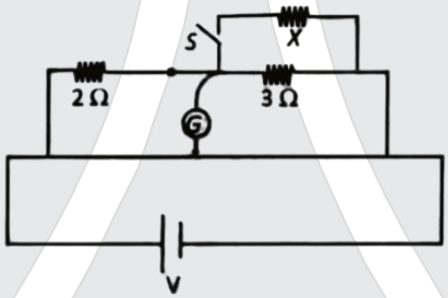
Ans. (1)

15. A light ray incident on the prism such that deviation is minimum and angle of incidence on 2^{nd} surface is critical angle. Find prism angle.

$(1) 60^\circ$ $(2) 105^\circ$ $(3)\ 74^\circ$ $(4) 90^\circ$

Ans. (1)

16. In meter bridge diagram given below, if S is closed, null point shifts by 25 cm . Find value of resistance X. (in cm)



(1) 1.68 $(2) 6.28$ (3) 5.4 (4) 4.1

Ans. (1)

17. Velocity of electron in n^{th} shell of a hydrogen like atom is 3×10^5 m/s and velocity of electron in m^{th} shell of that atom is 2.5×10^5 m/s. Find ratio of radius of m^{th} shell to n^{th} shell.

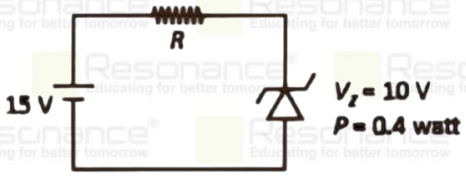
(1) 25/36 (2) 36/35 (3) $25/40$ (4) 36/25

Ans. (4)

18. For a microscope focal length of objective is 2 cm and focal length of eyepiece is 5 cm. Tube length is $= 10$ cm. Magnification for normal adjustment is $5x$. Find the value of x

Ans. (5)

19. For the given the breakdown voltage of Zener diode is $V_Z = 10$ volts and it can withstand the power dissipation of 0.4 watt. Find the value of resistance R (in Ω)



Ans. (125 Ω)