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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-2

DATE & DAY: 21st January 2026 & Wednesday

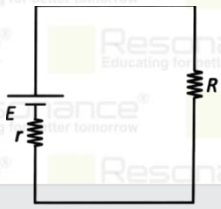
PAPER-1

Duration: 3 Hrs.
Time: 03:00 PM – 06:00 PM

SUBJECT: PHYSICS

PART : PHYSICS

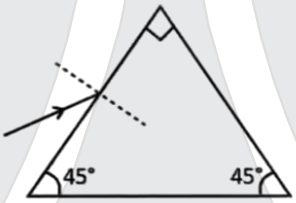
1. In a circuit there is a battery with internal resistance r and EMF E, which is connected to external load resistance R as shown. Find value of R so that maximum power dissipates across R.



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

Ans. (1)

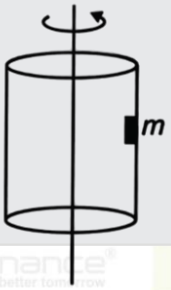
2. Refractive index of prism is $\sqrt{2}$. What should be angle of incidence for a light ray such that the emerging ray grazes out the surface.



(1) 90° (2) 60° (3) 30° (4) 45°

Ans. (1)

3. A block of mass m is at rest w.r.t. hollow cylinder which is rotating with angular speed ω. Radius of cylinder is R. Find minimum coefficient of friction between block and cylinder.



(1) $\frac{3g}{2\omega^2 R}$ (2) $\frac{g}{\omega^2 R}$ (3) $\frac{g}{4\omega^2 R}$ (4) $\frac{2g}{\omega^2 R}$

Ans. (2)

4. Keeping the significant figures in view the sum of the physical quantities 52.0 m, 153.2 m and 0.123 m is

(1) 205.3 m (2) 205 m (3) 205.333 m (4) 205.33 m

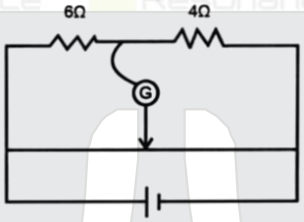
Ans. (1)

5. The energy of an electron an orbit of Bohr's atom is -0.04$\in_0$eV where $\in_0$ is (G – state^2) energy. If L is the angular momentum of e in this orbit and h is plank's constant then $\frac{2\pi L}{h}$ is...

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

Ans. (1)

6. The total length of potentiometer wire AB is 50 cm in the arrangement so in the in fig. If ' P' is the point where the galvanometer shows zero reading Then the length AP is ___ cm .



(1) 15 (2) 20 (3) 30 (4) 25

Ans. (3)

7. The rms speed of oxygen molecules at $47°C$ is equal to that of hydrogen molecules kept at ___ $^\circ C$ $\left(\frac{M(0)}{M(h)}=\frac{32}{2}\right)$

(1) -100 (2) -253 (3) -20 (4) -235

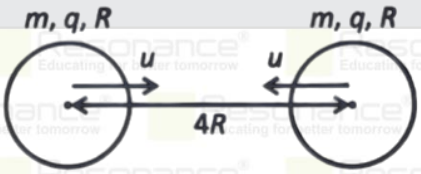
Ans. (2)

8. The Kinetic energy of a simple hormonic oscillating with angular frequency of $176\ rad/s$. The frequency of the simple harmonic oscillator is $-Hz\left(\pi=\frac{22}{7}\right)$

(1) 176 (2) 14 (3) 28 (4) 88

Ans. (4)

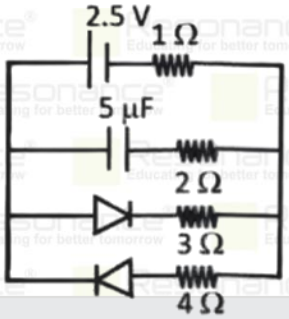
9. Two spheres having equal mass m, charge q and radius R, are moving towards each other. Both have speed u at an instant when distance between their centers is $4R$. Minimum value of u so that they touch each other is



(1) $\sqrt{\frac{q^2}{4\pi\varepsilon_0 mR}}$ (2) $\sqrt{\frac{q^2}{16\pi\varepsilon_0 mR}}$ (3) $\sqrt{\frac{q^2}{\pi\varepsilon_0 mR}}$ (4) $\sqrt{\frac{q^2}{8\pi\varepsilon_0 mR}}$

Ans. (2)

10. For the given circuit arrangement, find the change on the capacitor in steady state.



(1) 15 μF (2) $\frac{75}{8}\mu C$ (3) $\frac{15}{2}\mu F$ (4) $\frac{55}{4}\mu C$

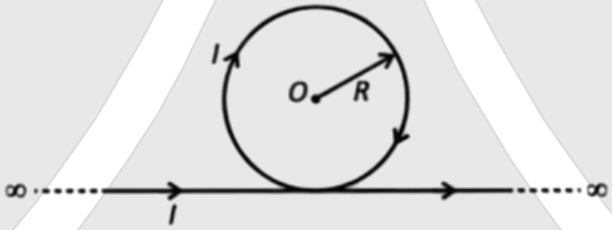
Ans. (2)

11. Position x of the particle of mass 2 kg function of time as $x = t^2 + t + 1$. Find out work done on the particle from $t_1 = 2sec$ to $t_2 = 3sec$.

(1)18 joule (2)30 joule (3)34 joule (4)24 joule

Ans. (4)

12. Find magnetic field at point ' O ' in the given figure shown.



(1) $\frac{\mu_0 I}{R}\left(2+\frac{1}{\pi}\right)$ (2) $\frac{\mu_0 I}{2R}\left(1+\frac{1}{\pi}\right)$ (3) $\frac{\mu_0 I}{2R}\left(1-\frac{1}{\pi}\right)$ (4) $\frac{\mu_0 I}{4R}\left(2+\frac{1}{\pi}\right)$

Ans. (3)

13. Consider two statements given below :

Statement-I: In YDSE, if distance between slits & screen increases, fringe width also increases.

Statement-II: If wavelength of light used in YDSE increases, fringe width also increases. Which of the following options is correct?

(1) Both statements I & II are correct

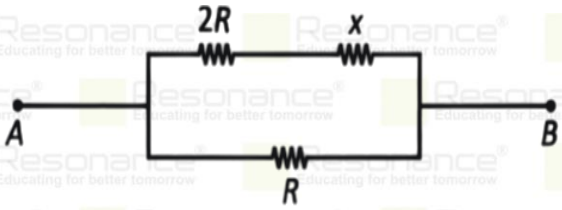
(2) Statement I is correct but statement II is incorrect

(3) Statement I is incorrect but statement II is correct

(4) Both statements I & II are incorrect

Ans. (1)

14. For the given resistive network, the net resistance across $AB = x$. Then find the value of x.



(1) $x = R(\sqrt{2} - 1)$ (2) $x = R(\sqrt{3} + 1)$

(3) $x = R(\sqrt{2} + 1)$ (4) $x = R(\sqrt{3} - 1)$

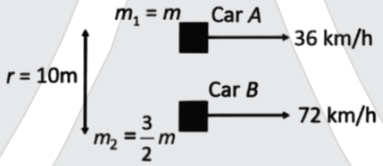
Ans. (4)

15. A diatomic gas $(\gamma = 1.4)$ does 100 J of work in an isobaric expansion. The heat given to the gas is:

(1) 350 J (2) 490 J (3) 150 J (4) 250 J

Ans. (1)

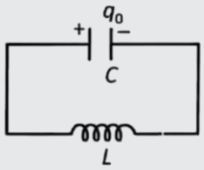
16. Two cars moving parallelly to each other with the velocities shown. Initial separation between cars is $r = 10$ m. Find angular momentum of car A w.r.t. car B.



(1) 100 m (2) 200 m (3) 150 m (4) 75 m

Ans. (1)

17. In the given L-C circuit, charge on the capacitor is maximum at $t = 0$, find time at which charge becomes 25% of it's initial value first time.



(1) $\sqrt{LC}\cos^{-1}\left(\frac{1}{4}\right)$ (2) $\frac{L}{R}\ln 2$ (3) $\sqrt{LC}\sin^{-1}\left(\frac{1}{4}\right)$ (4) $\sqrt{LC}\cos^{-1}\left(\frac{1}{2}\right)$

Ans. (1)

18. A boat crosses a river, 200 m wide, in minimum possible time. If velocity of river is 5 m/s and velocity of boat is still water is 10 m/s. Then, find time taken to cross the river and displacement of the boat.

(1) 20 sec. and $100\sqrt{5}$ m (2) 10 sec. and $100\sqrt{5}$ m

(3) 20 sec. and $200\sqrt{5}$ m (4) 20 sec. and 200 m

Ans. (1)

19. In diagram given below, pulley is a ring of mass M and radius R filled with two rods each of mass m and length 2R along diameter such that if pulley rotates, rods also rotate with same angular velocity. Find magnitude of acceleration of m when system is released.

(1) $\frac{3(M-m)g}{(6M+5m)}$ (2) $\frac{6(M-m)g}{(6M+5m)}$ (3) $\frac{3(M-m)g}{(M+m)}$ (4) $\frac{6(M-m)g}{(M+m)}$

Ans. (1)

20. Two capillaries are dipped in two different liquids having meniscus radius R_1, $R_2(R_1 > R_2)$ and surface Tension T_1 & T_2. If density of liquids are same :

(1) $h_1 = h_2$ then $T_1 = T_2$ (2) $h_1 > h_2$ then $T_1 = T_2$
(3) $h_1 > h_2$ then $T_1 < T_2$ (4) $h_1 < h_2$ then $T_1 = T_2$

Ans. (4)