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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-1

DATE & DAY: 21st January 2026 & Wednesday

PAPER-1

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

SUBJECT: PHYSICS

REGISTERED & CORPORATE OFFICE (CIN: U80302RJ2007PLC024029):
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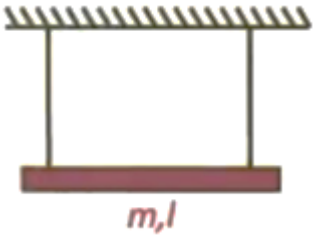
PART : PHYSICS

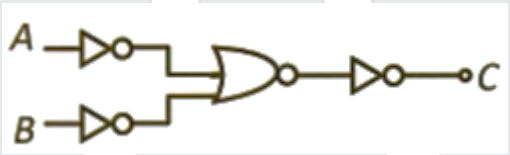
1. A rod of mass m and length $/$ is attached to two ideal strings. Find tension in left string just after right string is cut.



(1) $\frac{mg}{2}$ (2) $\frac{mg}{4}$ (3) $\frac{2}{3}mg$ (4) $\frac{mg}{5}$

Ans. 2

2. Which logic gate is given in the figure?



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

Ans. 3

3. Find dimensions of $\frac{A}{B}$ if $\left(P+\frac{AE^2}{B}\right)+\frac{1}{2}\rho V^2 =$ constant, where $P \rightarrow$ pressure, $\rho \rightarrow$ density, $V \rightarrow$ speed.

(1)$ML^1\ T^{-4}$ (2)$ML^{-1}\ T^{-4}$ (3)$ML^2\ T^{-4}$ (4)$ML^{-1}\ T^{-2}$

Ans. 2

4. An α-particle having kinetic energy 7.7 MeV is approaching fixed gold nucleus (atomic number is 79). Find distance of closest approach.

(1) 1.72 nm (2) 6.2 nm (3) 16.8 nm (4) 0.2 nm

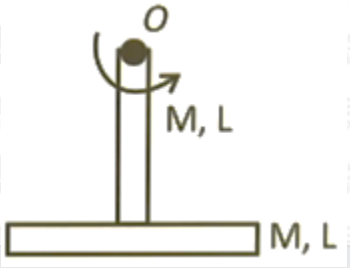
Ans. 1

5. An air filled capacitor of capacitance C filled with dielectric $(k = 3)$ of width $d/3$, where d is separation between plates. The new capacitance is

(1) $\frac{9}{5}C$ (2) $\frac{5}{4}C$ (3) $\frac{4}{3}C$ (4) $\frac{9}{7}C$

Ans. 4

6. Find the moment of inertia of system formed using two identical rods about the given axis of rotation as shown.



(1) $\frac{17}{12}ML^2$ (2) $\frac{13}{12}ML^2$ (3) $\frac{2}{3}ML^2$ (4) $\frac{3}{4}ML^2$

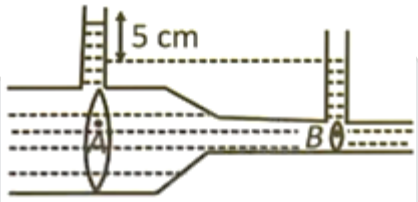
Ans. 1

7. If electric field of EM wave is given by $60\left[\sin 2\pi(3\times10^{11}t)+\sin 2\pi(12\times10^{11}t)\right]$ at $x=0$ falls on a photo sensitive material having work function 2.8 eV . Find the maximum kinetic energy (M eV) of ejected electrons.

(1) 2.52eV (2) 2.16eV (3) 2.00eV (4) 2.34eV

Ans. 2

8. Find volume flow rate in the venturi meter given below in which water is flowing. [Cross-section area at $A\&B$ is & $a, \frac{A}{a}=2\cdot\ A=\sqrt{3}\ \text{m}^2$. $\text{P}=1000\ \text{kg/m}^3$.]



(1)1 (2)$\sqrt{3}$ (3) $2\sqrt{3}$ (4)$\sqrt{2}$

Ans. 1

9. Wave propagates whose electric field is given by $\vec{E}=69\sin(\omega t-kx)\hat{j}$, find the direction of magnetic field

(1)$\hat{k}$ (2) $-\hat{k}$ (3) $\frac{t+j}{\sqrt{2}}$ (4) $\frac{i-j}{\sqrt{2}}$

Ans. 1

10. Two rods of equal length of 60 cm each are joined together end to end. Coefficient of linear expansions of the rods are $24\times10^{-6}\text{C}^{-1}$ and $1.2\times10^{-5}\text{C}^{-1}$. Their temperatures are same and equal to 30°C which is increased to 100°C. Find final length of the combination (in cm)

(1)120.1321 (2)120.1123 (3) 120.1512 (4)120.1084

Ans. 3

11. Find change in internal energy of gas if its temperature changes by 10 K . Number of moles of gas is $10, C_p$ (specific heat at constant pressure of the gas is 7cal/K/mol) and R (gas constant) $= 2\text{cal/K}$.

(1) 1500 cal (2) 500cal (3) 250cal (4) 100cal

Ans. 2

12. Two mechanical wave on strings of equal length (L) tension (T) having linear mass density $\frac{\mu_1}{\mu_2} = \frac{1}{2}$. Find the ratio of time taken for a wave pulse to travel from one end to the other in both strings. (ignore gravity)

(1) $\frac{1}{\sqrt{5}}$ (2) $\frac{1}{\sqrt{2}}$ (3) $\sqrt{2}$ (4) $\sqrt{5}$

Ans. 2

13. A satellite is revolving around a planet in orbit radius of 1.5 R . Additional minimum energy required to transfer the satellite to new orbit radius of $3R$ is (and M are mass of satellite & planet) $\frac{GMm}{\lambda R}$ then X is __

Ans: 6

14. There are two springs of spring constants $k_1 = (20 \pm 0.2)\text{N/m}$ and $k_2 = (30 \pm 0.3)\text{N/m}$. If they are connected in parallel then percentage error in equivalent spring constant. of combination is ___ %.

Ans: 1

15. In a YDSE set up, a slab of width t is inserted in front of one of slit. The interference pattern shifts by 0.2 cm on the screen. If the refractive index of slab is 1.5 than t is $N\mu$ m (screen distance 50 cm and slits separation 1 mm) then N is ___

Ans: 8

16. A conducting circular loop of area 1.0 m^2 is placed perpendicular to a magnetic field which varies as $B = \sin(100t)$ tesla. If the resistance of the loop is 100Ω then average thermal energy dissipated in the loop in one period is

(1) 50 (2) 12 (3) 8 (4) 6

Ans. 1

17. Focal length of objective lens and eyepiece lens are 1.25 cm and 5 cm and tube length is 26 cm. Find magnification of compound microscope in normal adjustment.

Ans: 104