

MEMORY BASED QUESTIONS JEE-MAIN EXAMINATION – JANUARY 2026

(HELD ON THURSDAY 22nd JANUARY 2026)

TIME : 3:00 PM TO 6:00 PM

PHYSICS

TEST PAPER WITH SOLUTION

1. **Statement-1** : Work done by \vec{F} from \vec{r}_1 to \vec{r}_2 is

given as $W = -\int_{r_1}^{r_2} \vec{F} \cdot d\vec{r}$, if \vec{F} is conservative.

Statement-2 : There are infinite ways through which we can go from \vec{r}_1 to \vec{r}_2 and work done for each case will be different for conservative force.

(1) **Statement-1** is True, **Statement-2** is True ; **Statement-2** is correct explanation of **Statement-1**.

(2) **Statement-1** is True, **Statement-2** is True ; **Statement-2** is **NOT** correct explanation of **Statement-1**.

(3) **Statement-1** is True, **Statement-2** is False.

(4) **Statement-1** and **Statement-2** both are False.

Ans. (4)

Sol. Theoretical

2. In case of capillary action if surface tension of liquid, radius of capillary and density of liquid decreases by 1% then percentage change in height of liquid level inside capillary :

- (1) 1 % increase (2) 1 % decrease
- (3) 2 % increase (4) 2 % decrease

Ans. (1)

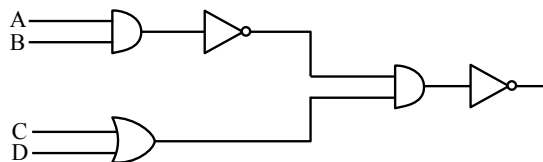
Sol. $h = \frac{2T \cos \theta}{\rho g r}$

$\frac{dh}{h} = \frac{dT}{T} - \frac{d\rho}{\rho} - \frac{dr}{r}$

$\frac{dh}{h} \% = -1\% + 1\% + 1\% = 1\%$

1% increase

3. For given logic gate circuit select correct output corresponding to each input :



A	B	C	D
1	1	1	1
1	0	1	0
0	1	0	1
0	0	1	1

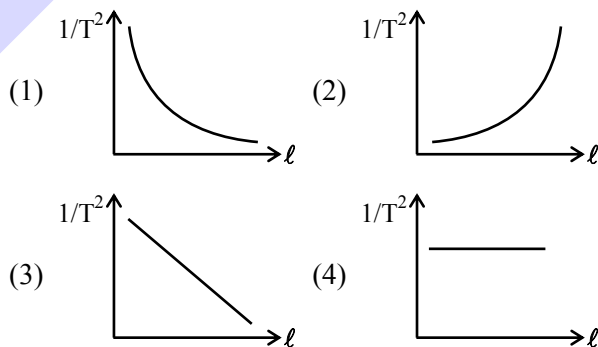
- (1) 1, 0, 0, 0 (2) 1, 0, 1, 0
- (3) 0, 1, 0, 1 (4) 1, 0, 0, 1

Ans. (1)

Sol. On simplifying :

Output $Y = \overline{(A \cdot B)} \cdot (C + D)$
 $= (\overline{A \cdot B}) + (\overline{C + D})$

4. In simple pendulum experiment gravity (g) is determined by its time period (T). Which of the following graph is correct?



Ans. (1)

Sol. $T = 2\pi \sqrt{\frac{l}{g}}$

$T^2 = \frac{4\pi^2 l}{g}$

$\frac{1}{T^2} = \left(\frac{g}{4\pi^2 l} \right)$



Predict your JEE Main 1 2026 percentile

Try ALLEN's FREE Percentile Predictor

Check Now

5. A metal has work function $\phi = 110 \times 10^{-20}$ J when exposed with monochromatic light maximum kinetic energy of photoelectrons is found to be zero. Find angular frequency of incident light. ($h = 6.63 \times 10^{-34}$ Js)

- (1) 1.04×10^{16} (2) 1.04×10^{18}
 (3) 1.66×10^{17} (4) 1.66×10^{18}

Ans. (1)

Sol. $\omega = 2\pi f$

$$hf - \phi = k_{\max}$$

$$f = \frac{\phi}{h} = \frac{110 \times 10^{-20}}{6.63 \times 10^{-34}} = 1.66 \times 10^{15}$$

$$\omega = 2\pi f = 1.04 \times 10^{16} \text{ rad/sec}$$

6. Transmission line having resistance 2Ω and power delivered is 1000 W. When potential difference of 250 volts is applied, find efficiency of transmission line.

- (1) 94 % (2) 96.9 %
 (3) 100 % (4) 91 %

Ans. (2)

Sol. Current in wire : $I = \frac{1000}{250} = 4$ Amp

$$\text{Heat loss} = I^2 R = 32 \text{ W}$$

$$\text{Power input} = 1032 \text{ W}$$

$$\% \eta = \frac{\text{Power output}}{\text{Power input}}$$

$$\% \eta = \frac{1000}{1032} = 96.89\%$$

7. Find the dimension of the expression $\frac{\epsilon_0 E}{T}$, where

ϵ_0 , E & T are permittivity, electric field and time :

- (1) $[AL^{-2}]$ (2) $[AL^{-3}]$
 (3) $[AL^{-3}T]$ (4) $\frac{[AL^{-3}]}{T}$

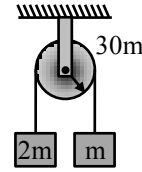
Ans. (1)

Sol. $\frac{\epsilon_0 E}{T} = \frac{\epsilon_0}{T} \times \frac{1}{4\pi\epsilon_0} \times \frac{q}{r^2}$

$$= \frac{[AT]}{[T][L^2]}$$

$$= [AL^{-2}]$$

8. A pulley has mass 30 m. There are two blocks of masses m and 2m. Find speed of 2m when it descends by distance 3.6 meter. ($g = 10 \text{ m/s}^2$)



- (1) -2 m/s (2) 4 m/s (3) 8 m/s (4) 2 m/s

Ans. (4)

Sol. Using energy conservation

$$2mgh - mgh = \frac{1}{2}mv^2 + \frac{1}{2}2mv^2 + \frac{1}{2} \frac{30mR^2}{2} \times \frac{v^2}{R^2}$$

$$mgh = 9mv^2$$

$$v = \sqrt{\frac{gh}{9}} = \sqrt{\frac{3.6 \times 10}{9}} = \sqrt{4} = 2 \text{ m/s}$$

9. 3 identical bubbles each have same charge q. They combine to form one bubble. Find $\frac{V_i}{V_f}$?

- (1) $\frac{1}{3^{2/3}}$ (2) $\frac{3^{2/3}}{1}$
 (3) $\frac{1}{2^{2/3}}$ (4) $3^{1/3}$

Ans. (1)

Sol. Using volume conservation

$$3 \left(\frac{4}{3} \pi r^3 \right) = \left(\frac{4}{3} \pi R^3 \right)$$

$$R = 3^{1/3} r$$

$$\frac{V_i}{V_f} = \frac{\frac{kq}{r}}{\frac{k3q}{R}} = \frac{R}{3r} = \frac{3^{1/3} r}{3r} = \frac{1}{3^{2/3}}$$

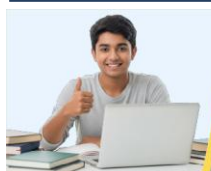
10. **Statement-1** :- Time period of revolution of satellite around earth depends on density of earth.

Statement-2 :- Time period of revolution of satellite just above the surface of earth is given by

$$2\pi \sqrt{\frac{Re}{g}} \quad (\text{Re} = \text{Radius of earth})$$

- (1) Statement 1 & 2 both are correct & statement 1 is correct explanation
 (2) Statement 1 & 2 both are correct & statement 1 is not correct explanation
 (3) Statement is true Statement 2 is false
 (4) Statement is false Statement 2 is true

Ans. (1)



Predict your JEE Main 1 2026 percentile

Try ALLEN's FREE Percentile Predictor

Check Now

Sol. Both are correct & explanation

$$T = 2\pi\sqrt{\frac{Re}{g}} = 2\pi\sqrt{\frac{Re}{\frac{4}{3}\pi G\rho Re}} = 2\pi\sqrt{\frac{3}{4\pi G\rho}}$$

$$T \propto \frac{1}{\sqrt{\rho}}$$

11. Wavelength of light in water is 540 nm. Refractive index of water is 4/3. Find wavelength of light in glass ($\mu = 3/2$):

- (1) 480 nm
- (2) 240 nm
- (3) 360 nm
- (4) 630 nm

Ans. (1)

Sol. $\Rightarrow \lambda \propto \frac{1}{\mu}$

$$\Rightarrow \frac{\lambda_1}{\lambda_2} = \frac{\mu_2}{\mu_1} = \frac{3/2}{4/3} = \frac{9}{8}$$

$$\lambda_2 = \frac{8}{9} \times 540 = 480 \text{ nm}$$

12. Five positive charges each having charge q are placed at the vertices of a pentagon as shown in the figure. The electric potential (V) & the electric field (\vec{E}) at the centre of the pentagon due to the 5 positive charges are :

(1) $V = \frac{5q}{4\pi\epsilon_0 r}, E = \frac{5q}{4\pi\epsilon_0 r^2}$

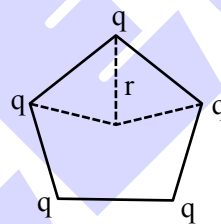
(2) $V = \frac{5q}{4\pi\epsilon_0 r}, E = 0$

(3) $V = 0, E = \frac{5q}{4\pi\epsilon_0 r^2}$

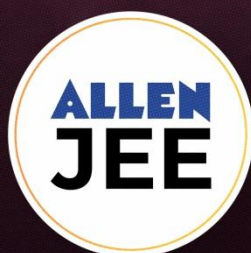
(4) $V = \frac{5q}{4\pi\epsilon_0 r}, E = \frac{q}{4\pi\epsilon_0 r^2}$

Ans. (2)

Sol.



ONE-STOP SOLUTION FOR JEE ASPIRANTS



SUBSCRIBE NOW



13. There are 2 different gases in 2 different containers A and B. Gas A has temperature 'T' and pressure 'P' and number of molecules per unit volume in Gas A is N. Gas B has temperature 'T' and pressure 'P' and number of molecules per unit volume is N. Mass of gas A is 4 times of mass of gas 'B' and size of molecules of gas A is half the size of molecules of gas 'B'. If collision frequency of B is 32×10^8 /sec. Find collision frequency of A :

- (1) 16×10^8 /sec (2) 4×10^8 /sec
 (3) 2×10^8 /sec (4) 8×10^8 /sec

Ans. (3)

Sol. Collision frequency (z) = $\sqrt{\frac{8RT}{\pi M}} (\sqrt{2} \pi d^2 N)$

$$\frac{Z_A}{Z_B} = \frac{\left(\frac{d}{2}\right)^2 \frac{N}{\sqrt{4M}}}{\left(\frac{d^2 N}{\sqrt{M}}\right)} \Rightarrow Z_A = Z_B \times \frac{1}{8}$$

$$= 32 \times 10^8 \times \frac{1}{8}$$

$$= 4 \times 10^8 / \text{sec}$$

14. $I = 4 \times 10^{14} \text{ W/m}^2$ then find amplitude of magnetic field of laser Beam :

- (1) 2.87 T (2) 1.83 T
 (3) 3.86 T (4) 4.78 T

Ans. (2)

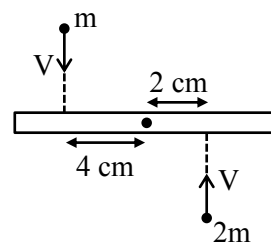
Sol. $I = \left(\frac{B^2}{2\mu_0} \cdot C\right) = 4 \times 10^{14}$

$$B^2 = \frac{2\mu_0}{C} \times 4 \times 10^{14}$$

$$B^2 = \frac{2 \times 4\pi \times 10^{-7} \times 4 \times 10^{14}}{3 \times 10^8}$$

$$B = 1.83 \text{ T}$$

15. Mass of rod is 20m. If both particles stick with rod after collision than find V/ω ? Here ω is angular velocity of rod after collision. Length of rod is 12 cm :



- (1) 64 (2) 66 (3) 33 (4) $\sqrt{88}$

Ans. (3)

Sol. Using angular momentum conservation about COM of rod :

$$L_i = L_f$$

$$m \times V \times 4 + 2m \times V \times 2 = \left(\frac{20m(12)^2}{12} + m \times 4^2 + 2m \times 2^2 \right) \omega$$

$$8mV = (240m + 24m)\omega$$

$$8V = 264 \omega$$

$$\frac{V}{\omega} = 33$$

16. An ideal gas at pressure $2 \times 10^5 \text{ Pa}$, temperature 27°C has volume 60 cm^3 . If volume of same gas is 20 cm^3 & temperature is 77°C , find out pressure at this state. :

- (1) $7 \times 10^5 \text{ Pa}$ (2) $6 \times 10^5 \text{ Pa}$
 (3) $3 \times 10^5 \text{ Pa}$ (4) $5 \times 10^5 \text{ Pa}$

Ans. (1)

Sol. $PV = nRT$

$$\frac{P_1 V_1}{RT_1} = \frac{P_2 V_2}{RT_2}$$

$$\frac{2 \times 10^5 \times 60}{R \times 300} = \frac{P_2 \times 20}{R \times 350}$$

$$P_2 = 7 \times 10^5 \text{ Pa}$$

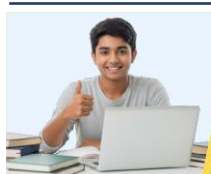
17. **Statement -1** : Total KE of system can be written as sum of KE of individual particles from ground frame.

Statement -2 : Total KE of system can be written as KE of center of mass + KE of individual particles in C.M. frame

- (1) statement-1 is true statement-2 is false
 (2) statement-1 is false statement-2 is true
 (3) Both statement are false.
 (4) Both statement are true.

Ans. (4)

Sol. $KE_{\text{system}} = KE_{\text{cm}} + KE_{\text{inC-frame}}$



Predict your JEE Main 1 2026 percentile

Try ALLEN's FREE Percentile Predictor

Check Now

18. For H atom if shortest wavelength of Lyman series is 91nm, then find difference of minimum wavelength of Balmer and Paschen series :

- (1) 525 nm (2) 455 nm
 (3) 305 nm (4) 545 nm

Ans. (2)

Sol. For Lyman:

$$\frac{1}{\lambda} = R \left(\frac{1}{1^2} - \frac{1}{\infty^2} \right) \Rightarrow \lambda = \frac{1}{R} = 91\text{nm}$$

For Balmer shortest wavelength:

$$\frac{1}{\lambda_1} = R \left(\frac{1}{2^2} - \frac{1}{\infty^2} \right) \Rightarrow \lambda_1 = \frac{4}{R}$$

For shortest wavelength of Paschen series

$$\frac{1}{\lambda_2} = R \left(\frac{1}{3^2} - \frac{1}{\infty^2} \right) \Rightarrow \lambda_2 = \frac{9}{R}$$

$$\text{So } \lambda_2 - \lambda_1 = \frac{5}{R} = 455\text{nm}$$

19. For single slit diffraction :

- (A) If we increase λ , keeping slit width constant, width of central maxima increases.
 (B) If we increase λ , keeping slit width constant, width of central maxima decreases.
 (C) If we keep λ same and decreases slit width, the width of central maxima increases
 (D) If we keep λ same and decreases slit width the width of central maxima decreases
 (E) If we increases λ by keeping slit width same, intensity of central maxima increases

Choose the correct option:

- (1) A, C only (2) B,D & E only
 (3) A, C & E only (4) A, D only

Ans. (1)

Sol. Width of central maxima = $\frac{2\lambda D}{a}$

20. For non parallax in concave mirror, what should be the position of object from the pole :

- (1) Beyond centre of curvature only
 (2) Between centre of curvature and focus only
 (3) Between focus and pole only
 (4) Beyond focus

Ans. (4)

Sol. For non-parallax, image should be real.

\therefore Object must be kept beyond focus.

21. In an open organ pipe 3rd and 6th harmonic frequency differ by 3200 Hz. Find the length of organ pipe. (Speed of sound = 320 m/s)

Ans. (15)

Sol. $f = n \frac{v_0}{2L}$

$$\frac{6v_0}{2L} - \frac{3v_0}{2L} = 3200$$

$$\frac{3 \times 320}{2L} = 3200$$

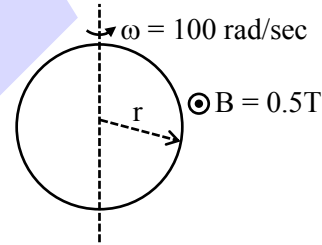
$$L = \frac{3}{20} \text{m}$$

$$L = \frac{3}{20} \times 100 \text{ cm} = 15 \text{ cm}$$

22. A ring of radius 'r' mm rotating with 100 rad/sec about its diameter. It is present in a uniform magnetic field 0.5 T perpendicular to the plane of paper. If EMF produced in the ring when it has rotated by 30° is 15.4 mV, find 'r':

Ans. (14)

Sol.



$$\phi = \pi r^2 B \cos \omega t$$

$$\therefore -\frac{d\phi}{dt} = \pi r^2 B \omega \sin \omega t$$

given $\left| \frac{d\phi}{dt} \right| = 15.4 \times 10^{-3} \text{ V}$

$$\therefore 15.4 \times 10^{-3} = \pi r^2 B \omega \sin(\omega t)$$

$$\Rightarrow r = \sqrt{\frac{15.4 \times 10^{-3}}{3.14 \times 0.5 \times 100 \times \frac{1}{2}}} = 14\text{mm}$$

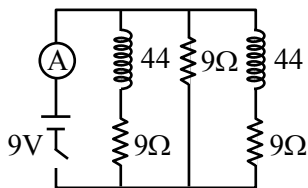


Predict your JEE Main 1 2026 percentile

Try **ALLEN's FREE Percentile Predictor**

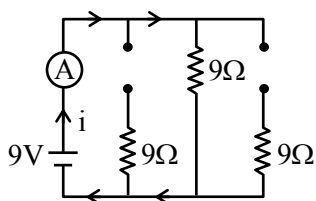
Check Now

23. In the figure shown below switch S is closed at $t = 0$, find reading of ideal ammeter (in Amp.) just after S is closed.



Ans. (1)

Sol.



at $t = 0$ all inductors act as open circuit

$$i = \frac{9}{9} = 1\text{A}$$

24. A tube carries 1.6 A current has length 2m & cross section area = 0.2mm^2 . If potential difference of 2V is applied and no. of electrons/volume is 5×10^{28} , mobility of electron is $\alpha \times 10^{-3}$ find α :

Ans. (1)

Sol. $i = ne AV_d = neA\mu E$

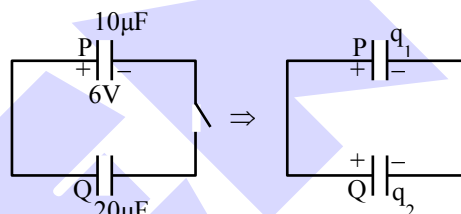
$$\mu = \frac{i}{neAE} = \frac{1.6}{5 \times 10^{28} \times 1.6 \times 10^{-19} \times 0.2 \times 10^{-6} \times (2/2)}$$

$$= 1 \times 10^{-3}$$

25. A capacitor "P" of capacitance 10×10^{-6} F is charged to 6 Volts and is now connected to another capacitor Q of capacitance 20×10^{-6} F (Q has no initial charge). The final charge on Q is $\alpha \times 10^{-5}$ C. Find α .

Ans. (4)

Sol. Charge will be distributed in ratio of capacitors



$$\frac{q_1}{q_2} = \frac{1}{2} \text{ and } q_1 + q_2 = 60$$

$$3q_1 = 60$$

$$q_1 = 20 \mu\text{C}$$

$$q_2 = 40 \mu\text{C} = 4 \times 10^{-5} \text{ C}$$



Predict your JEE Main 1 2026 percentile

Try ALLEN's FREE Percentile Predictor

Check Now

ALLEN

For Class 12th Pass Students

**RISE. REPEAT.
RANK UP IN JEE**

JOIN LEADER COURSE

JEE (Main+Adv.) 2027

 **26th Mar & 15th Apr**

AIR
1
JEE (Adv.) 2025
Rajit Gupta
CLASSROOM



Know more 

ALLEN ONLINE

Think **JEE 2027**
will be your **best shot?**

Join the **Leader Online Course!**

Win up to

90% scholarship 

via **ASAT**

Enrol Now



ALLEN ONLINE

Get REAL exam practice
for **JEE Main 2026**

with the

Major Online Test Series!



13 full-syllabus tests



100+ additional mock tests



50,000+ teacher-recommended Qs. & more



Buy Now

ALLEN

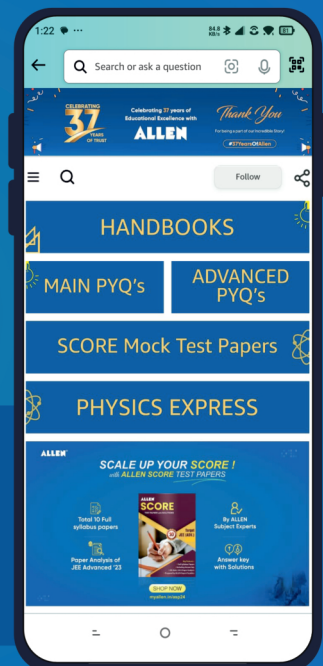
Get The Latest

IIT-JEE Special Books
at Your Door Steps...!!

JOIN THE JOURNEY OF LEARNING

with

HANDBOOKS | ADVANCED-QB | SCORE PAPERS
PHYSICS EXPRESS | MAIN PYQ's | Adv. PYQ's



SHOP NOW



Available in
HINDI & ENGLISH