28/01/2026
Evening

Aakash
Medical | IIT-JEE | Foundations

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Memory Based
Answers & Solutions

Time : 3 hrs. *for* M.M. : 300

JEE (Main)-2026 (Online) Phase-1

(Physics, Chemistry and Mathematics)

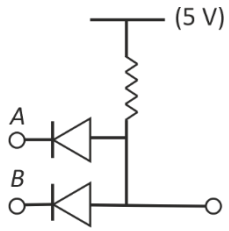
PHYSICS

SECTION - A

Multiple Choice Questions: This section contains 20 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4), out of which **ONLY ONE** is correct.

Choose the correct answer:

1. For the circuit given below, identify the logic gate.



(1) AND

(2) OR

(3) NAND

(4) NOR

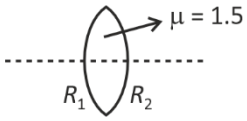
Answer (1)

Sol. Truth table

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

Clearly AND Gate.

2. Object is placed at distance 30 cm from lens given below, then distance of image from lens is (R_1 = 10 cm, R_2 = 20 cm)



(1) 36 cm (2) 24 cm

(3) 20 cm (4) 30 cm

Answer (2)

Sol. $\frac{1}{f}=\frac{1}{2}\left(\frac{1}{10}+\frac{1}{20}\right)=\frac{3}{40}$

$\frac{1}{v}-\frac{1}{-30}=\frac{3}{40}$

$\Rightarrow \frac{1}{v}=\frac{5}{120}$

v = 24 cm

3. The position vector is given as $\vec{r}=x\hat{i}+y\hat{j}+z\hat{k}$ and if its signs reversed then which of the following physical quantity remains unaffected?

(1) Acceleration

(2) Velocity

(3) Displacement

(4) Torque

Answer (4)

Sol. $\vec{r}\times\vec{F}\equiv-\vec{r}\times-\vec{F}\equiv\vec{\tau}$

4. If the mass number of nucleus is α, its radius is R_α. And another mass number of β then its radius is R_β ; then $\frac{R_\alpha}{R_\beta} = ?$ [Given $\beta = 8\alpha$]

(1) 8 (2) $\frac{1}{2}$

(3) 1 (4) 2

Answer (2)

Sol. We know $R = R_0(A)^{1/3}$

So, $R_\alpha = R_0(\alpha)^{1/3}$

$R_\beta = R_0(\beta)^{1/3}$

So, $\frac{R_\alpha}{R_\beta} = \left[\frac{\alpha}{\beta}\right]^{1/3} = \left(\frac{1}{8}\right)^{1/3} = \frac{1}{2}$

5. Which of following physical quantity is not measurable?

(1) Displacement (2) Voltage

(3) Voltage difference (4) Acceleration

Answer (2)

Sol. Voltage difference or EMF difference, $\Delta\varepsilon = -\int_1^2 \vec{E}\cdot\vec{dl}$ can be measured. But to define voltage we need a reference point, but as being non-conservative field that will give inconsistent result.

6. Two light sources of 450 nm and 550 nm are used for YDSE with slit distance 2.25 mm and distance between the slits and screen is 1.5 m. Then the distance from central maxima at which minima of both wavelength coincide?

(1) 1.65 mm (2) 1.20 mm

(3) 1.30 mm (4) 1.40 mm

Answer (1)

Sol. $\frac{\lambda_1}{\lambda_2} = \frac{2m-1}{2n-1} = \frac{9}{11}$

5th maximum of 550 nm coincides will 11th maxima of 450 nm.

$y = \frac{9}{2}\frac{\lambda D}{d} = \frac{9}{2}\times\frac{550\times10^{-9}}{2.25\times10^{-3}}\times\frac{3}{2} = 1.650$

7. A beam of power 2 μW is hitting a metal surface beam contains photons of wavelength 662 nm. Find number of photons striking per second.

(1) 2×10^{14} (2) 6.67×10^{12}

(3) 4×10^{11} (4) 3.2×10^{13}

Answer (2)

Sol. $n = \frac{P}{\text{energy of one photons}}$

$= \frac{2\times10^{-6}}{hC/\lambda}$

$= \frac{2\times10^{-6}\times662\times10^{-3}}{6.63\times10^{-34}\times3\times10^{8}}$

$N = 6.67 \times 10^{12}$

8. Mean free path of gas particles of diameter 5 Å at temperature and pressure of 41°C and 1.38×10^5 Pa.

(1) 14.14 nm (2) 20 nm

(3) 28.28 nm (4) 10 nm

Answer (3)

Sol. $\lambda = \frac{1kT}{\sqrt{2}\pi d^2 P}$ and $P = nkT$

$\lambda = \frac{1.38\times10^{-23}\times3.14}{1.414\times3.14\times25\times10^{-20}\times1.38\times10^{5}}$

$= \frac{\sqrt{2}}{2\times25}\times10^{-21+20-5}$

9. Find the percentage error in *K*, where $T = 2\pi\sqrt{\frac{m}{k}}$. Given that 60 oscillations completes in 50 second. Time resolution is 2 second, m = 10 g and $\Delta m = \pm 10mg$.

(1) 8% (2) 9 %

(3) 9.1% (4) 8.1 %

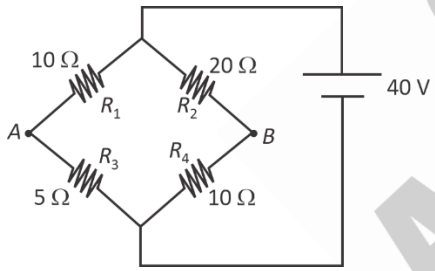
Answer (4)

Sol. $\frac{\Delta T}{T} = \frac{2}{50}$ and $\frac{\Delta m}{m} = 10^{-3}$

$\Rightarrow \frac{2\Delta T}{T} + \frac{\Delta m}{m} = \frac{\Delta k}{k}$

$\Rightarrow \left(\frac{4}{50} + 10^{-3}\right) \times 100 = 8.1\%$

10. In a balanced wheatstone bridge $R_2R_3 : R_1R_4$. Because of heating R_3 increases by 20%. Then potential difference across *A* & *B* becomes



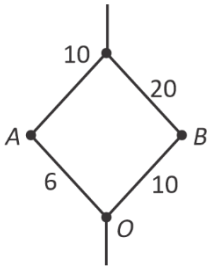
(1) 1.50 V (2) 2.40 V

(3) 1.67 V (4) 3.60 V

Answer (3)

Sol. $V_A = \frac{40}{16} \times 6$

$V_B = \frac{40}{3}$



$\Delta V = 40 \times \frac{3}{8} - \frac{40}{3}$

$= 40\left\{\frac{3}{8} - \frac{1}{3}\right\}$

$= \frac{5}{3}$

11. Match the two columns and choose the correct option.

	Column-I		**Column-II**
(a)	Coefficient of viscosity	(p)	$[ML^0T^{-2}]$
(b)	Surface tension	(q)	$[ML^{-1}T^{-2}]$
(c)	Pressure	(r)	$[ML^2T^{-2}]$
(d)	Work	(s)	$[ML^{-1}T^{-1}]$

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

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

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

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

Answer (2)

Sol. For (a) $F = -\eta A\frac{dv}{dx}$

(b) $T = \frac{F}{L}$

(c) $P = \frac{F}{A}$

(d) $W = \vec{F} \cdot \vec{r}$

12. Given that $v = \sqrt{\frac{Y}{P}}$. Find the maximum % error in v.

Given that $\frac{\Delta Y}{Y}\times 100 = 1\%$ and $\frac{\Delta P}{P}\times 100 = 0.5\%$

(1) $\frac{3}{2}\%$

(2) $\frac{3}{4}\%$

(3) 1%

(4) $\frac{1}{2}\%$

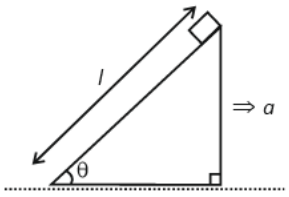
Answer (2)

Sol. $\frac{\Delta v}{v} = \frac{1}{2}\frac{\Delta Y}{Y} + \frac{1}{2}\frac{\Delta P}{P}$

So $\left(\frac{\Delta v}{v}\times 100\right) = \frac{1}{2}\left(\frac{\Delta Y}{Y}\right)\times 100 + \frac{1}{2}\left(\frac{\Delta P}{P}\times 100\right)$

$\Rightarrow \left(\frac{\Delta V}{V}\times 100\right) = \frac{1}{2} + \frac{1}{4} = \frac{3}{4}\%$

13. Find the time taken by block to reach the ground when released from a top of a wedge of inclination θ and length l, maintained at a constant acceleration 'a' to the right as shown. (all contacts case smooth and block doesn't loose contact with wedge).



(1) $t = \sqrt{\frac{l}{g\cos^2\theta + a\sin\theta}}$

(2) $t = \sqrt{\frac{l}{g\sin\theta + a\cos\theta}}$

(3) $t = \sqrt{\frac{2l}{g\sin\theta + a\cos\theta}}$

(4) $t = \sqrt{\frac{l}{2g\cos\theta + a\sin\theta}}$

Answer (3)

Sol. Applying pseudo force on block and resolving forces along incline we get $A = g\sin\theta + a\cos\theta$.

$\Rightarrow \frac{1}{2}At^2 = l$

$\Rightarrow t = \sqrt{\frac{2l}{g\sin\theta + a\cos\theta}}$

14.

15.

16.

17.

18.

19.

20.

SECTION - B

Numerical Value Type Questions: This section contains 5 Numerical based questions. The answer to each question should be rounded-off to the nearest integer.

21.

22.

23.

24.

25.