

JEE Main 2024 Question Paper Jan 31 Shift 1 (B.E./B.Tech)

JEE Main Physics Questions

Ques 1. Stopping potential is 8 V if wavelength of incident light is λ and it is 2 V for 3λ . Find threshold wavelength.

Ans. 9λ

Ques 2. Two charges Q and $3Q$ are kept in a line separated by a distance R . Electric field is zero at a distance x from Q . Find the value of x .

Ans. $(\sqrt{3}-1)R/2$

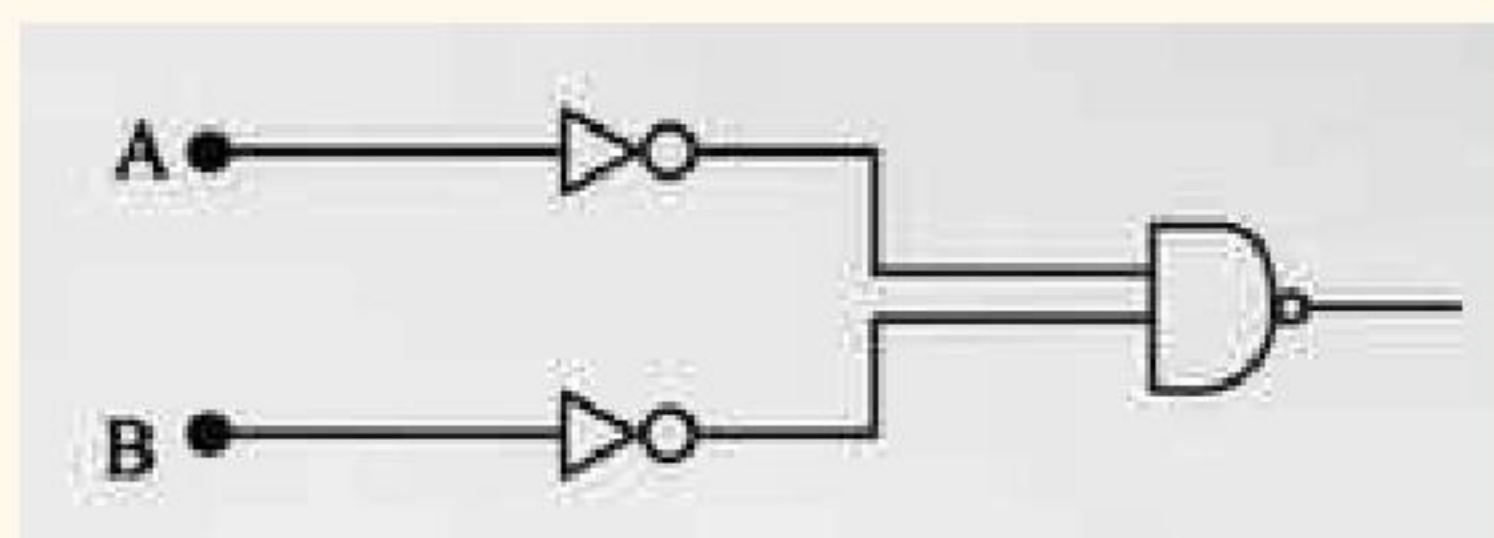
Ques 3. If the mass defect in a nuclear reaction is 0.4gm then find the Q value of the reaction.

Ans. $3.6 \times 10^{13} \text{ J}$

Ques 4. Find minimum deviation in a thin prism if refractive index $\mu = \cot(A/2)$. Here A represents the angle of prism.

Ans. $\delta = \pi - 2A$

Ques 5. Output of given circuit represents which logic gate :

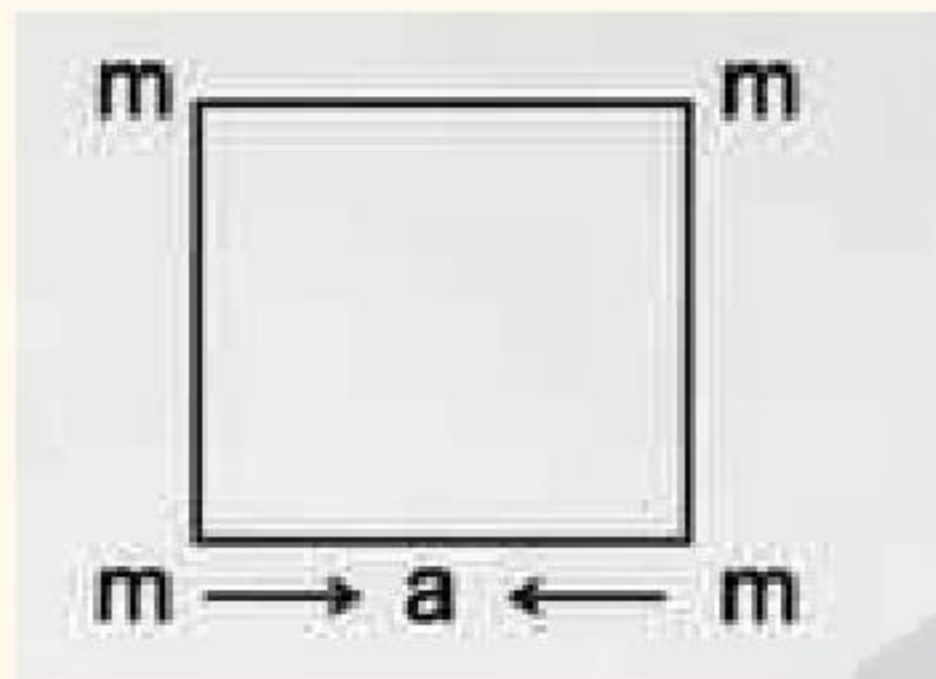


- A. NAND
- B. NOR
- C. AND
- D. OR

Ans. D

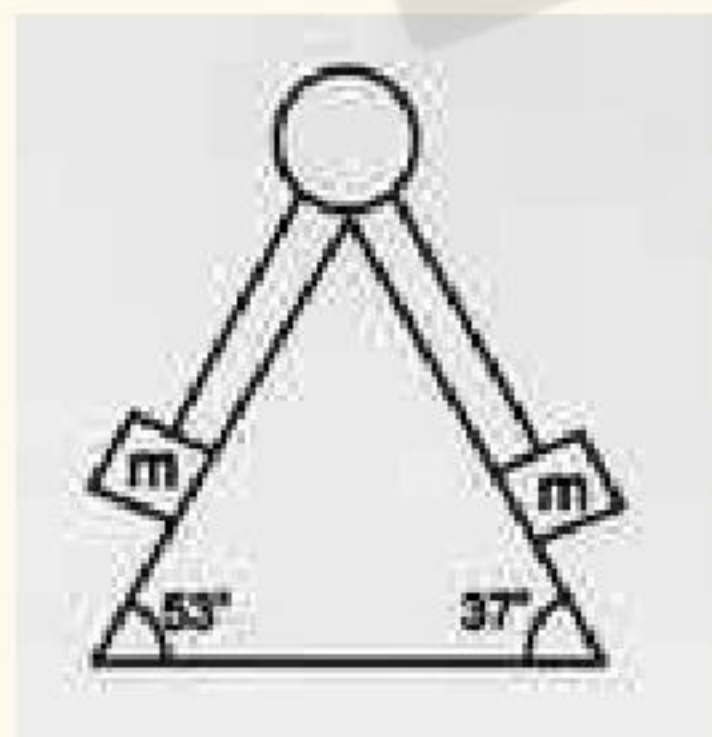
Ques 6. Four equal masses m are kept at corners of a square of side

a. If net gravitational force on a mass is given by $\left(\frac{2\sqrt{2}+1}{32}\right) \frac{Gm^2}{L^2}$. Find the value of a in the terms of L .



Ans. $a = 4L$

Ques 7. Find the value of m if $M = 10$ kg. All the surfaces are rough.



- A. 2.5kg
- B. 7.5kg
- C. 12.5kg
- D. 5kg

Ans. B

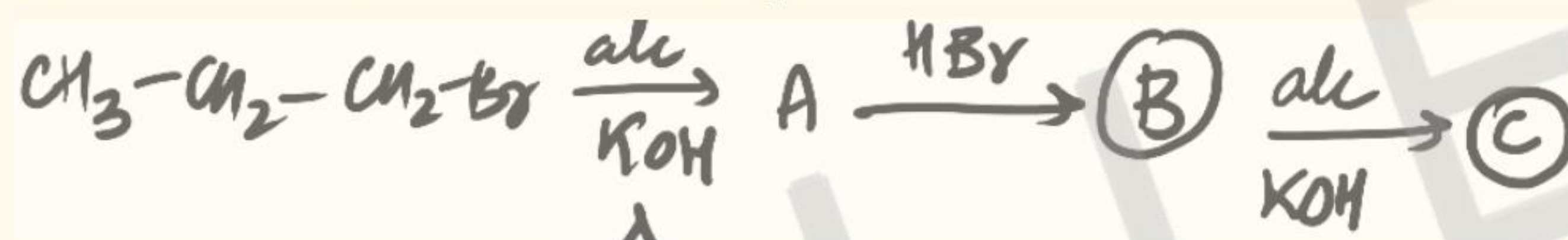
Ques 8. If the percentage error in measuring length and diameter of a wire is 0.1% each, then the percentage error of the resistance of the wire is :

- A. 0.3%
- B. 0.2%
- C. 0.1%
- D. 0.4%

Ans. A

JEE Main Chemistry Questions

Ques 1. Find out the final product C.



- A. Propan-1-ol
- B. Propan-2-ol
- C. Propene
- D. Propane

Ans. B

Ques 2. Which of the following options contain amphoteric oxide(s) only?

- A. SnO_2 and SiO
- B. SiO_2
- C. SnO_2 and PbO_2
- D. CO and SiO

Ans. C

Ques 3. How many of the following compounds have sp^3 hybridized central atoms?

H_2O , NH_3 , SiO_2 , SO_2 , CO , CH_4 and BF_3

Ans. 4

Ques 4. Color of PbI_2

Ans. Yellow

Ques 5. Magnetic behavior of Ni^{2+} with strong ligand

Ans. $\mu = 0$

Ques 6. On which factor, electrical conductivity of electrolytic cell does not depend

- A. Concentration of electrolyte**
- B. Amount of electrolyte added**
- C. Temperature**
- D. Nature of electrode**

Ans. D

JEE Main Mathematics Questions

Ques 1. Which of the following is most acidic?

- A. $10 * 2^5$**
- B. $10 * 10^{16}$**
- C. $10 * 10^{-16}$**
- D. $5 * 10^{16}$**

Ans. A

$$f(x) = \begin{vmatrix} x^3 & 2x^2 + 1 & 1 + 3x \\ 3x^2 + 2 & 2x & x^3 + 6 \\ x^3 - x & 4 & x^2 - 2 \end{vmatrix}$$

Ques 2. If for all $x \in \mathbb{R}$, then $2f(0) + f'(0)$ is equal to

Ans. 42

Ques 3. let 's' be the set of positive integral values of a for which

$$\frac{ax^2 + 2(a+1)x + 9a + 4}{x^2 + 8x + 32} < 0, \forall x \in \mathbb{R}.$$

Then, the number of elements in 's' is

Ans. 0

Ques 4. If $f(x) = \frac{4x+3}{6x-4}, x \neq \frac{2}{3}$ and $(f \circ f)(x) = g(x)$, where

$g: \mathbb{R} - \left\{\frac{2}{3}\right\} \rightarrow \mathbb{R} - \left\{\frac{2}{3}\right\}$ then $(g \circ g \circ g)(4)$ is equal to

Ans. 4

Ques 5. If the system of linear equations $x - 2y + z = -4$; $2x + \alpha y + 3z = 5$ and $3x - y + \beta z = 3$ has infinitely many solutions then $12\alpha + 13\beta$ is equal to

Ans. 104.28