

## JEE Main 2024 April 5 Shift 1 Memory Based Questions and Answers

1.

**?** Suppose  $\theta \in [0, \frac{\pi}{4}]$  is a solution at  $4\cos\theta - 3\sin\theta = 1$  then  $\cos\theta$  is equal to

a)  $\frac{6-\sqrt{6}}{(3\sqrt{6}-2)}$

b)  $\frac{4}{(3\sqrt{6}+2)}$

c)  $\frac{4}{(3\sqrt{6}-2)}$

d)  $\frac{6-\sqrt{6}}{(3\sqrt{6}+2)}$

**Ans. C**

2.

**?** If the function  $f(x) = \frac{\sin 3x + \alpha \sin x - \beta \cos 3x}{x^3}$ ,  $x \in \mathbb{R}$ , is continuous at  $x = 0$ , then  $f(0)$  is

a) 4

b) 2

c) -4

d) -2

**Ans. C**

3.

**?**  $\int_0^{\pi/4} \frac{136 \sin x}{3 \sin x + 5 \cos x} dx$  is equal to

**A)**  $3P_1 - 10 \log_e(2\sqrt{2}) + \log_e 5$

**B)**  $3p_1 - 25 \log_e 2 + 10 \log_e 5$

**c)**  $3p_1 - 30 \log_e 2 + 20 \log_e 5$

**D)**  $3p_1 - 50 \log_e^2 + 20 \log_e 5$

**Ans. D**

4.

**?** If the time period of a pendulum at height  $R$  (Where  $R$  is radius of earth) from surface of earth is  $T_1$  and at height  $2R$  it is  $T_2$ , then

**(a)**  $3T_1 = 2T_2$

**(b)**  $2T_1 = 3T_2$

**(C)**  $T_1 = 3T_2$

**(d)**  $3T_1 = 4T_2$

**Ans. A**

5.



A point source of light is placed at focus of convex lens, then what is the shape of wavefront after passing through the lens

- (a) Planer
- (b) cylindrical
- (C) spherical
- (d) elliptical

Ans. A

6.

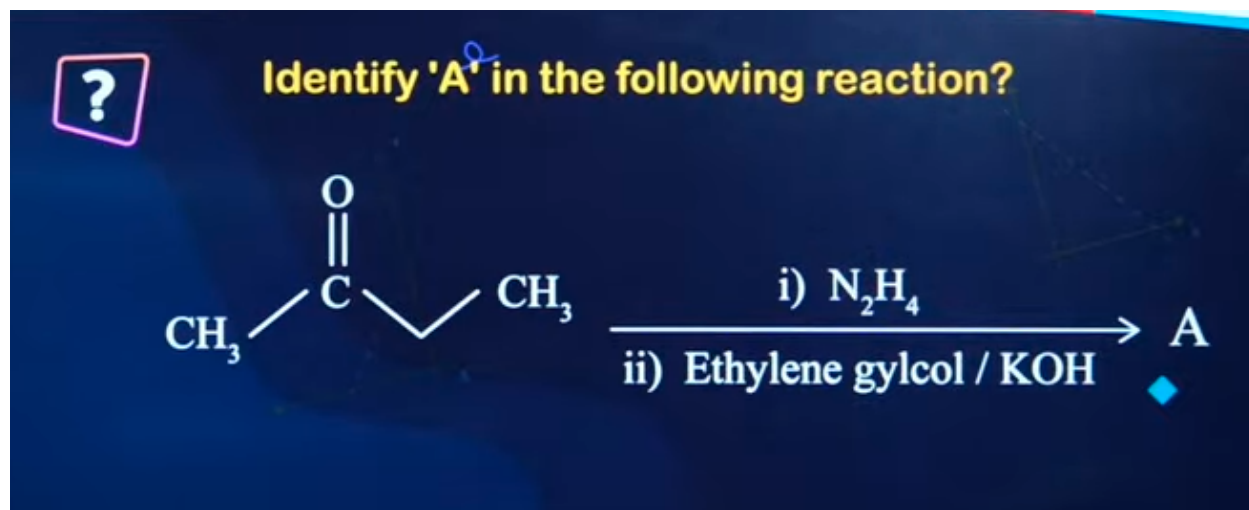


Find dimension of  $\sqrt{G \cdot \mu}$ , where G is universal gravitational constant and  $\mu$  is energy ~~gradient~~ density

- ✓ (a)  $[LT^{-2}]$
- (b)  $[L^2T^{-2}]$
- (C)  $[LT^{-3}]$
- (d)  $[LT^{-1}]$

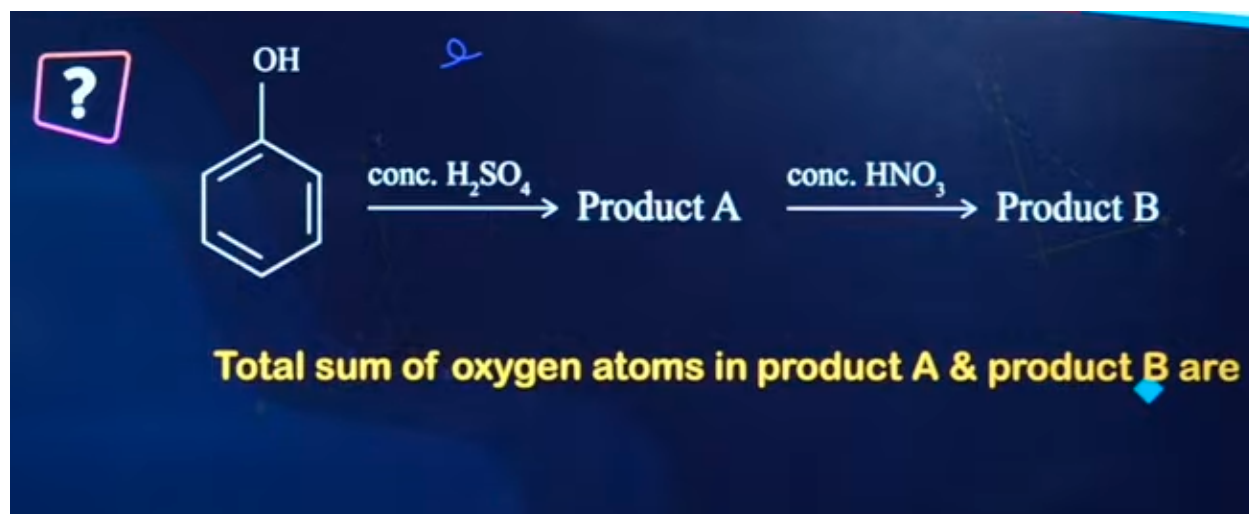
Ans. A

7.



**Ans.** n-Butane

8.



**Ans.** 14

9.

**?** The correct order of ligands arranged in increasing field strength

(A)  $\text{Br}^- < \text{F}^- < \text{H}_2\text{O} < \text{NH}_3$

(B)  $\text{F}^- < \text{Br}^- < \text{I}^- < \text{NH}_3$

(C)  $\text{H}_2\text{O} < \text{OH}^- < \text{CN}^- < \text{NH}_3$

(D)  $\text{Cl}^- < \text{OH}^- < \text{Br}^- < \text{CN}^-$

**Ans. A**

10.

**?** Which metal shows highest and maximum number of oxidation state?

a) Mn

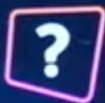
b) Fe

c) Co

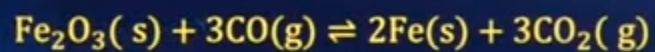
d) Cr

**Ans. A**

11.



Consider the reaction:



Which of the following will not affect the equilibrium state:

- (I) Addition of  $\text{Fe}_2\text{O}_3$       (II) Addition of  $\text{CO}_2$   
(III) Decreasing mass of  $\text{Fe}_2\text{O}_3$       (IV) Removal of  $\text{CO}$

- a) (II) and (IV)  
b) (I) and (IV)  
c) (I) and (III)  
d) All will affect the equilibrium

**Ans. C**