

JEE Main 2024 April 5 Shift 1 Memory Based Questions

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

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

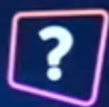
a) 4

b) 2

c) -4

d) -2

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

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) $3T_1 = 4T_2$

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

6.



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

(a) $[LT^{-2}]$

(b) $[L^2T^{-2}]$

(c) $[LT^{-3}]$

(d) $[LT^{-1}]$

7.



Identify 'A' in the following reaction?



8.

?



conc. H_2SO_4

Product A

conc. HNO_3

Product B

Total sum of oxygen atoms in product A & product B are

9.

?

The correct order of ligands arranged in increasing field strength

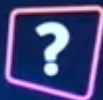
(A) $\text{Br}^- < \text{F}^- < \text{H}_2\text{O} < \text{NH}_3$

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

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

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

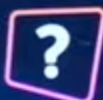
10.



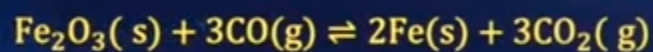
Which metal shows highest and maximum number of oxidation state?

- a) Mn
- b) Fe
- c) Co
- d) Cr

11.



Consider the reaction:



Which of the following will not affect the equilibrium state:

- (I) Addition of Fe_2O_3 (II) Addition of CO_2
(III) Decreasing mass of Fe_2O_3 (IV) Removal of CO

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