AP EAPCET 2025 May 21 Shift 2 Question Paper

Time Allowed :3 Hours	**Maximum Marks :**160	**Total questions :**160

General Instructions

Read the following instructions very carefully and strictly follow them:

1. Duration of Exam: 3 Hours
2. Total Number of Questions: 160 Questions
3. Section-wise Distribution of Questions:
    - Physics - 40 Questions
    - Chemistry - 40 Questions
    - Mathematics - 80 Questions
4. Type of Questions: Multiple Choice Questions (Objective)
5. Marking Scheme: One mark awarded for each correct response
6. Negative Marking: There is no provision for negative marking.

1. If a and b are the roots of the equation $2x^2 + 5x + 30 = 0$, find the value of $a^2 + b^2$.

(A) $\frac{13}{4}$

(B) $\frac{31}{4}$

(C) $\frac{25}{4}$

(D) $\frac{49}{4}$

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2. What is the distance between the points $(3, -2)$ and $(-1, 4)$?

(A) 6

(B) $\frac{5}{2}$

(C) $\sqrt{52}$

(D) 8

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3. A rectangular garden has a length that is 3 meters more than its width. If the area of the garden is 88 square meters, what is the width of the garden?

(A) 8 m

(B) 5 m

(C) 7 m

(D) 11 m

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4. A point P divides the line joining points $A(2, 3)$ and $B(10, 7)$ in the ratio 3:1 internally. What are the coordinates of point P?

(A) (6, 6)

(B) (5, 4)

(C) (8, 6)

(D) (4, 5)

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5. From the top of a tower 50 meters high, the angle of depression to a point on the ground is 30°. What is the distance from the base of the tower to that point on the ground? (Assume the ground is horizontal)

(A) $\frac{25}{3}$ meters

(B) $\frac{50}{3}$ meters

(C) $\frac{50}{\sqrt{3}}$ meters

(D) 100 meters

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6. A solid sphere of mass M and radius R is rotating about its diameter. What is its moment of inertia about the same axis?

(A) $\frac{1}{2}MR^2$

(B) $\frac{2}{5}MR^2$

(C) $\frac{3}{5}MR^2$

(D) $\frac{1}{5}MR^2$

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7. Two tuning forks produce frequencies of 256 Hz and 260 Hz. When sounded together, how many beats are heard per second? If the intensity of both sources is equal, what type of interference occurs at the beat minima?

(A) 2 beats/s, Constructive interference

(B) 4 beats/s, Destructive interference

(C) 4 beats/s, Constructive interference

(D) 2 beats/s, Destructive interference

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8. A coil of 100 turns and area 0.01 m² is placed perpendicular to a uniform magnetic field that increases uniformly from 0 to 0.2 T in 0.1 s. What is the magnitude of the induced EMF in the coil?

(A) 1 V

(B) 0.2 V

(C) 2 V

(D) 0.1 V

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9. The combustion of methane is represented by the equation:

$$\mathrm{CH_4}(g) + 2\mathrm{O_2}(g) \rightarrow \mathrm{CO_2}(g) + 2\mathrm{H_2O}(l)$$

Given: $\Delta H_{\text{CH}_4} = -75\,\text{kJ/mol}$

$\Delta H_{\text{CO}_2} = -393.5\,\text{kJ/mol}$

$\Delta H_{\text{H}_2\text{O}} = -285.8\,\text{kJ/mol}$

What is the enthalpy change (ΔH) for the combustion of 1 mole of methane?

(A) -890.3 kJ/mol

(B) -650.1 kJ/mol

(C) -1000.5 kJ/mol

(D) -500.0 kJ/mol

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10. Which of the following compounds undergoes Markovnikov addition when treated with HBr?

(A) CH2=CH2

(B) CH3-CH=CH2

(C) CH3-C=CH

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11. For a reaction:

$$A + B \rightarrow \text{Products}$$

It is found that doubling the concentration of A doubles the rate, while doubling B increases the rate fou

(A) 1

(B) 2

(C) 3

(D) 4

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12. At 700 K, the equilibrium constant K_e for the reaction

$$\text{N}_2(g) + 3\text{H}_2(g) \rightleftharpoons 2\text{NH}_3(g)$$

is 0.2 mol L^{-2}. What is the value of K for the reverse reaction?

(A) 5

(B) 0.2

(C) 0.04

(D) $\frac{1}{0.2}$
