

## AP EAPCET 2025 May 22 Shift 2 Question Paper

<b>Time Allowed :3 Hours</b>	<b>Maximum Marks :160</b>	<b>Total questions :160</b>
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### 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.**

**Evaluate the integral:**

$$\int_0^1 \frac{\ln(1+x)}{1+x^2} dx$$

- (A)  $\frac{\pi}{8} \ln 2$
  - (B)  $\frac{\pi}{4} \ln 2$
  - (C)  $\frac{\pi}{8} \ln(1 + \sqrt{2})$
  - (D)  $\frac{\pi}{4} \ln(1 + \sqrt{2})$
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**2.**

**If  $a$  and  $b$  are the roots of the equation  $4x^2 - 12x + 11 = 0$ , find the value of  $a^2 + b^2$ .**

- (A)  $\frac{7}{2}$
  - (B)  $\frac{5}{2}$
  - (C)  $\frac{3}{2}$
  - (D)  $\frac{1}{2}$
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**3.**

**A body of mass 4 kg is moving with a velocity of 3 m/s. What is its kinetic energy?**

- (A) 18 J
  - (B) 36 J
  - (C) 9 J
  - (D) 12 J
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**4.**

**Find the distance between the points (2, 3) and (5, 7) in the Cartesian plane.**

- (A) 5
  - (B) 4
  - (C) 6
  - (D) 7
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5.

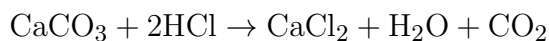
Find the determinant of the matrix:

$$\begin{bmatrix} 3 & 2 \\ 1 & 5 \end{bmatrix}$$

- (A) 13
  - (B) 11
  - (C) 15
  - (D) 17
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6.

How many grams of calcium carbonate ( $\text{CaCO}_3$ ) are required to completely neutralize 200 mL of 0.5 M HCl? Given the reaction:



(Molar mass of  $\text{CaCO}_3 = 100 \text{ g/mol}$ )

- (A) 5.0 g
  - (B) 10.0 g
  - (C) 2.5 g
  - (D) 7.5 g
- 

7.

A point charge of  $+2 \mu\text{C}$  is placed at the origin. What is the magnitude of the electric field at a point 3 m away along the x-axis? (Use  $k = 9 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$ )

- (A)  $2 \times 10^3 \text{ N/C}$
  - (B)  $6 \times 10^3 \text{ N/C}$
  - (C)  $4 \times 10^3 \text{ N/C}$
  - (D)  $8 \times 10^3 \text{ N/C}$
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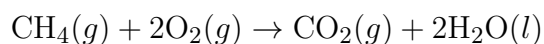
8.

If  $\sin \theta = \frac{3}{5}$  and  $\theta$  is in the first quadrant, find the value of  $\tan \theta$ .

- (A)  $\frac{3}{4}$
  - (B)  $\frac{4}{3}$
  - (C)  $\frac{3}{5}$
  - (D)  $\frac{5}{4}$
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**9.**

**Calculate the enthalpy change ( $\Delta H$ ) for the combustion of 1 mole of methane ( $\text{CH}_4$ ) given the reaction:**



**Given bond energies: C–H = 413 kJ/mol, O=O = 498 kJ/mol, C=O = 803 kJ/mol, O–H = 467 kJ/mol.**

- (A) –890 kJ/mol
  - (B) –802 kJ/mol
  - (C) –954 kJ/mol
  - (D) –726 kJ/mol
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**10.**

**A car accelerates uniformly from rest to a speed of 20 m/s in 8 seconds. What is the distance covered by the car during this time?**

- (A) 80 m
  - (B) 160 m
  - (C) 100 m
  - (D) 120 m
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**11.**

**A bag contains 4 red and 5 blue balls. One ball is drawn at random. What is the probability that it is red?**

- (A)  $\frac{4}{9}$
- (B)  $\frac{5}{9}$
- (C)  $\frac{2}{9}$

(D)  $\frac{1}{3}$

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**12.**

**For a first-order reaction, the concentration of a reactant decreases from 0.8 M to 0.4 M in 20 minutes. What is the half-life of the reaction? (Use  $\ln 2 = 0.693$ )**

(A) 20 min

(B) 10 min

(C) 40 min

(D) 15 min

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**13.**

**A force of 10 N acts on a 2 kg object initially at rest, moving it 8 m along a straight line. What is the work done by the force? Assume the force is parallel to the displacement.**

(A) 80 J

(B) 40 J

(C) 120 J

(D) 20 J

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