AP EAPCET 2025 May 26 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 the roots of the quadratic equation $2x^2 - 4x + k = 0$ are real and equal, find the value of k.

(A) 2

(B) 3

(C) 4

(D) 5

---

2. If $\tan\theta = \frac{4}{3}$, find the value of $\sin\theta$ in the first quadrant.

(A) $\frac{3}{5}$

(B) $\frac{4}{5}$

(C) $\frac{3}{2}$

(D) $\frac{4}{5}$

---

3. Find the midpoint of the line segment joining the points (3, 4) and (7, -2).

(A) (5, 1)

(B) (4, 1)

(C) (5, 2)

(D) (4, 2)

---

4. A bag contains 5 red and 3 blue balls. If one ball is drawn at random, what is the probability that it is red?

(A) $\frac{3}{8}$

(B) $\frac{5}{8}$

(C) $\frac{3}{5}$

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

---

5. If the roots of the quadratic equation $ax^2 + bx + c = 0$ are in the ratio 3:4, then which of the following relationships holds between the coefficients?

(1) $7b^2 = 48ac$

(2) $48b^2 = 7ac$

(3) $b^2 = 12ac$

(4) $12b^2 = ac$

---

6. Find the derivative of the function $f(x) = \sin^{-1}(2x\sqrt{1-x^2})$ with respect to x, for $x \in (-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}})$.

(1) $\frac{2}{\sqrt{1-4x^2}}$

(2) $\frac{1}{\sqrt{1-x^2}}$

(3) $\frac{2}{\sqrt{1-x^2}}$

(4) $\frac{1}{\sqrt{1-4x^2}}$

---

7. If $\sin\theta + \cos\theta = \sqrt{2}\cos\theta$, then the value of $\tan\theta$ is

(1) $\sqrt{2} + 1$

(2) $\sqrt{2} - 1$

(3) $1 - \sqrt{2}$

(4) $\frac{1}{\sqrt{2}+1}$

---

8. The equation of the circle passing through the points (1, 1), (2, 2), and (3, 1) is

(1) $x^2 + y^2 - 2x - 2y + 1 = 0$

(2) $x^2 + y^2 - 4x - 2y + 5 = 0$

(3) $x^2 + y^2 - 4x - 4y + 7 = 0$

(4) $x^2 + y^2 - 2x - 4y + 3 = 0$

---

9. A particle is projected at an angle of 60° to the horizontal with an initial speed of $20\,\text{m/s}$. If $g = 10\,\text{m/s}^2$, what is the maximum height reached by the particle?

(1) $15\,\text{m}$

(2) $20\,\text{m}$

(3) $30\,\text{m}$

(4) $45\,\text{m}$

---

10. Two capacitors of capacitances $4\,\mu\text{F}$ and $6\,\mu\text{F}$ are connected in series across a potential difference of $300\,\text{V}$. What is the potential difference across the $4\,\mu\text{F}$ capacitor?

(1) $100\,\text{V}$

(2) $120\,\text{V}$

(3) $180\,\text{V}$

(4) $200\,\text{V}$

---

11. A light ray passes from air ($\mu = 1$) into a glass slab ($\mu = 1.5$) at an angle of incidence of 30°. What is the angle of refraction inside the glass slab?

(1) 19.5°

(2) 22.5°

(3) 35.0°

(4) 45.0°

---

12. The rate constant for a first-order reaction is $0.0693\,\text{min}^{-1}$. What is the half-life of the reaction?

(1) $10\,\text{min}$

(2) $15\,\text{min}$

(3) $5\,\text{min}$

(4) $20\,\text{min}$

---

13. What is the IUPAC name of the compound $CH_3CH_2COCH_2CH_3$?

(1) Pentan-3-one

(2) Butan-2-one

(3) Pentan-2-one

(4) Hexan-3-one

---

14. Which of the following elements has the highest first ionization energy?

(1) Sodium

(2) Magnesium

(3) Aluminum

(4) Silicon

---

15. The enthalpy change (ΔH) for the reaction $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ is -92 kJ/mol. What is the enthalpy change for the decomposition of 1 mol of $NH_3(g)$ into its elements?

(1) $+46$ kJ/mol

(2) -46 kJ/mol

(3) $+92$ kJ/mol

(4) -92 kJ/mol
