

KEAM 2026 Engineering April 22

Question Paper (memory based)

Conducted by CEE Kerala



General Instructions

- (**Duration:** The total duration of the examination is 3 hours (180 minutes).
- (**Total Marks:** The complete paper carries a maximum of 600 marks.
- (**Structure:** The paper has 3 Sections:
 - **Section A:** 45 Multiple Choice Questions (Physics).
 - **Section B:** 30 Multiple Choice Questions (Chemistry).
 - **Section B:** 75 Multiple Choice Questions (Mathematics).
- (**Compulsory Questions:** All 150 questions are compulsory.
- (Each question has four options. Only **one** option is correct.
- (**Correct Answer:** +4 marks.
- (**Incorrect Answer:** -1 (Negative marking).
- (**Unanswered/Marked for Review:** 0 marks.

MATHEMATICS

1. $\int (\tan^2(2x) - \cot^2(2x))dx =$

- (a) $-\frac{1}{2}(\tan 2x + \cot 2x) + C$
- (b) $2(\tan 2x + \cot 2x) + C$
- (c) $\frac{1}{2}(\tan 2x - \cot 2x) + C$
- (d) $-\frac{1}{2}(\tan 2x - \cot 2x) + C$

(e) $\frac{1}{2}(\tan 2x + \cot 2x) + C$

2. If $x + 13y = 40$ is normal to the curve $y = 5x^2 + ax + \beta$ at the point $(1, 3)$, then the value of $a\beta$ is equal to:

- (a) 15
 - (b) -6
 - (c) 6
 - (d) 13
 - (e) -15
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3. Let $f(x) = \begin{cases} 3x + 6, & \text{if } x \geq c \\ x^2 - 3x - 1, & \text{if } x < c \end{cases}$, where $x \in \mathbb{R}$ and c is a constant. The values of c for which f is continuous on $\mathbb{R}$ are:

- (a) -7, 1
 - (b) 1, 3
 - (c) -1, 7
 - (d) -1, 6
 - (e) 2, -3
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4. In a box there are four marbles and each of them is marked with distinct number from the set $\{1, 2, 5, 10\}$. If one marble is randomly selected four times with replacement and the number on it noted, then the probability that the sum of numbers equals 18 is:

- (a) $\frac{1}{64}$
 - (b) $\frac{3}{16}$
 - (c) $\frac{5}{32}$
 - (d) $\frac{3}{32}$
 - (e) $\frac{1}{32}$
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5. Three fair dice are rolled simultaneously. Let a, b, c be the numbers on the top of the dice. Then the probability that $\min(a, b, c) = 6$ is:

- (a) $\frac{1}{216}$
 - (b) $\frac{1}{36}$
 - (c) $\frac{1}{6}$
 - (d) $\frac{11}{216}$
 - (e) $\frac{5}{6}$
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CHEMISTRY

1. Oxidation number of potassium in K_2O , K_2O_2 and KO_2 , respectively, is:

- (a) +2, +1 and $+\frac{1}{2}$
 - (b) +1, +1 and +1
 - (c) +1, +4 and +2
 - (d) +1, +2 and +4
-

2. Which one of the following is not an allylic halide?

- (a) 4-bromopent-2-ene
 - (b) 3-bromo-2-methylbut-1-ene
 - (c) 1-bromobut-2-ene
 - (d) 4-bromobut-1-ene
 - (e) 3-bromo-2-methylpropene
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3. A neutral molecule XF_3 has a zero dipole moment. The element X is most likely:

- (a) chlorine
- (b) boron
- (c) nitrogen

- (d) carbon
 - (e) bromine
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4. Among the following species, identify the pair having same bond order CN^- , O_2^- , NO^+ , CN^+ :

- (a) CN^- and O_2^-
 - (b) O_2^- and NO^+
 - (c) CN^- and NO^+
 - (d) CN^- and CN^+
 - (e) NO^+ and CN^+
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5. Which one of the following conditions will favour maximum formation of the product in the reaction, $A_2(g) + B_2(g) \rightleftharpoons X_2(g)$ $\Delta_r H = -x$ kJ:

- (a) Low temperature and high pressure
 - (b) Low temperature and low pressure
 - (c) High temperature and low pressure
 - (d) High temperature and high pressure
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PHYSICS

1. A light ray enters from medium 1 to medium 2. Its velocity in medium 1 is 2×10^8 m/s and in medium 2 is 1.5×10^8 m/s. The critical angle for the pair of media is:

- (a) $\sin^{-1}(0.75)$
 - (b) $\sin^{-1}(0.5)$
 - (c) $\sin^{-1}(0.66)$
 - (d) $\sin^{-1}(0.8)$
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2. A container with a pin hole at the bottom is filled with water and kerosene (specific gravity 0.8). The height of the water layer is 10 cm and the kerosene layer is 20 cm. The velocity of efflux of water is:

- (a) 2.3 m/s
 - (b) 4.5 m/s
 - (c) 1.5 m/s
 - (d) 3.2 m/s
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3. In a Young's double slit experiment, the intensity at a point where the path difference is $\frac{\lambda}{6}$ (λ being the wavelength of light used) is I . If I_0 denotes the maximum intensity, I/I_0 is equal to:

- (a) $1/2$
 - (b) $\sqrt{3}/2$
 - (c) $3/4$
 - (d) $1/4$
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4. A particle of mass m is moving in a circular path of constant radius r such that its centripetal acceleration a_c is varying with time t as $a_c = k^2 r t^2$, where k is a constant. The power delivered to the particle by the forces acting on it is:

- (a) $2\pi m k^2 r^2 t$
 - (b) $m k^2 r^2 t$
 - (c) $\frac{1}{3} m k^4 r^2 t^5$
 - (d) 0
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5. A source of frequency f gives 5 beats/sec when sounded with a source of frequency 200 Hz. The second harmonic of f gives 10 beats/sec when sounded with a source of frequency 420 Hz. The value of f is:

- (a) 195 Hz
 - (b) 205 Hz
 - (c) 190 Hz
 - (d) 210 Hz
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