KEAM 2025 April 28 Question Paper

Time Allowed :3 Hours	**Maximum Marks : 600**	**Total Questions :**150

General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper comprises 150 questions.
2. The Paper is divided into three parts- Maths, Physics and Chemistry.
3. There are 45 questions in Physics, 30 questions in Chemistry and 75 questions in Mathematics.
4. For each correct response, candidates are awarded 4 marks, and for each incorrect response, 1 mark is deducted.

1. Which of the following is not an EWG (Electron Withdrawing Group)?

(A) CN

(B) COOH

(C) COOR

(D) OCH_3

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2. CrO_3 is —— oxide?

(A) Chromium (III) oxide

(B) Chromium (IV) oxide

(C) Chromium (V) oxide

(D) Chromium (VI) oxide

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3. Radius order of Yb^{3+}, La^{3+}, Ce^{3+}, Pm^{3+}?

(A) $Yb^{3+} > La^{3+} > Ce^{3+} > Pm^{3+}$

(B) $Yb^{3+} < La^{3+} < Ce^{3+} < Pm^{3+}$

(C) $Yb^{3+} > Ce^{3+} > Pm^{3+} > La^{3+}$

(D) $Yb^{3+} < Ce^{3+} < Pm^{3+} < La^{3+}$

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4. For a first-order reaction, if the rate constant is $k = 6.93 \times 10^{-3}$, what is the half-life ($t_{1/2}$) of the reaction?

(A) $t_{1/2} = \frac{0.693}{k}$

(B) $t_{1/2} = \frac{1}{k}$

(C) $t_{1/2} = \frac{2}{k}$

(D) $t_{1/2} = k$

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5. A wave from a source having power 1 watt is incident on a surface of area 200 m^2. What is the intensity of the wave?

(A) $I = \frac{P}{A} = \frac{1}{200}$

(B) $I = P \times A$

(C) $I = P + A$

(D) $I = \frac{A}{P}$

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6. Increasing ionic radii of lanthanoids having +2 oxidation state?

(A) $La^{2+} < Ce^{2+} < Pr^{2+} < Nd^{2+}$

(B) $Eu^{2+} < Sm^{2+} < Gd^{2+} < Tb^{2+}$

(C) $La^{2+} < Nd^{2+} < Pr^{2+} < Eu^{2+}$

(D) $Eu^{2+} < Gd^{2+} < Tb^{2+} < Dy^{2+}$

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7. Mobility is the ratio of drift velocity and ?

(A) Current

(B) Electric field

(C) Charge

(D) Resistance

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8. Ratio of wavelength of first two modes of open pipe

(A) 2:1

(B) 1:2

(C) 1:1

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9. If the mean kinetic energy of Helium is 5000 J at 400 K, then the kinetic energy of neon at 800 K is

(A) 10000 J

(B) 12500 J

(C) 5000 J

(D) 20000 J

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10. A body starts from rest and is moving with a constant acceleration a. The relation between instantaneous displacement and time is

(A) $s = ut + \frac{1}{2}at^2$

(B) $s = \frac{1}{2}at^2$

(C) $s = at^2$

(D) $s = vt$

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11. Total kinetic energy of a satellite at height h is k. Then total energy of the satellite is

(A) $-k$

(B) $-2k$

(C) k

(D) $-3k$

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12. A farm roller of mass 100 kg is given a force of 300 N at a 30° angle to the ground. Find net force acting on it in the vertical direction.

(A) 150 N

(B) 300 N

(C) 250 N

(D) 100 N

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13. Radius of gyration of a disc about its diameter is?

(A) $\frac{r}{\sqrt{2}}$

(B) $\frac{r}{\sqrt{3}}$

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

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

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14. Gyro magnetic ratio is?

(A) $\frac{M}{I}$

(B) $\frac{I}{M}$

(C) $\frac{q}{m}$

(D) $\frac{m}{q}$

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15. Dimensional formula of Planck's constant is similar to

(A) Angular momentum

(B) Linear momentum

(C) Force

(D) Velocity

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16. The work done to move a charge of 3 C from A to B is 12 J. Find potential difference between A and B.

(A) 4 V

(B) 6 V

(C) 12 V

(D) 3 V

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17. Resistivity of a wire is proportional to

(A) Relaxation time

(B) Area

(C) Length

(D) Temperature

(E) Number density of electrons

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18. If $f(x) = \sin x e^{\sin x}$**, find** $f'(x)$

(A) $\cos x e^{\sin x} + \sin x e^{\sin x}$

(B) $\cos x e^{\sin x} - \sin x e^{\sin x}$

(C) $\cos x e^{\sin x} + e^{\sin x}$

(D) $\cos x e^{\sin x} + \sin x e^{\cos x}$

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19. If $\tan(x-y) = \frac{4}{5}$**,** $\tan(x+y) = \frac{6}{5}$**, then** $\tan(2x) =$

(A) $\frac{11}{12}$

(B) $\frac{12}{11}$

(C) $\frac{13}{14}$

(D) $\frac{14}{13}$

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20. Evaluate $\int_1^3 [x-1]\,dx$

(A) 4

(B) 6

(C) 8

(D) 10

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21. P(A) = 0.4, P(B/A) = 0.9. Then P(A B) is

(A) 0.36

(B) 0.54

(C) 0.72

(D) 0.84

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22. Distance between two foci of the hyperbola $x^2 - 4y^2 = 16$ **is**

(A) 4

(B) 6

(C) 8

(D) 10

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23. If $|x+3| < 2$**, then** x **lies in**

(A) $(-5,-1)$

(B) $(-2,2)$

(C) $(-4,-2)$

(D) $(-1,5)$

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24. If $f(x)$ **is continuous in** $\mathbb{R}$**,**

$$f(x) = \begin{cases} \frac{3x^2-12}{x-2}, & x \neq 2 \\ k, & x = 2 \end{cases}$$

find k.

(A) 3

(B) 2

(C) 4

(D) 6

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25. If $1, a, b, c, 16$ is in G.P., then $\sqrt[3]{abc} =$

(A) 4

(B) 8

(C) 16

(D) 12

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26. Evaluate $\int \sin x \cdot \sin 2x \, dx$

(A) $-\frac{1}{4}\cos 3x + \frac{1}{4}\cos x$

(B) $-\frac{1}{4}\cos 3x - \frac{1}{4}\cos x$

(C) $\frac{1}{4}\cos 3x + \frac{1}{4}\cos x$

(D) $\frac{1}{4}\cos 3x - \frac{1}{4}\cos x$
