

KEAM Sample Paper 2025

Q1: A boy sitting in a bus moving at a constant velocity throws a ball vertically up into the air. The ball will fall

- A) in the bus in front of the boy
- B) in the bus on the side of the boy
- C) outside the bus
- D) in the hands of the boy
- E) in the bus behind the boy

Q2: A machine gun fires a bullet of mass 25 g with a velocity of 1000 m/s. If the man holding the gun can exert a maximum force of 100 N on the gun, the maximum number of bullets that can he fire per second is

- A) 4
- B) 12
- C) 8
- D) 6
- E) 3

Q3: A fluid has a streamline flow through a horizontal pipe of variable cross-sectional area. Then

- A) its velocity is minimum at the narrowest part of the tube and the pressure is minimum at the widest point
- B) its velocity and pressure both are maximum at the widest point
- C) its velocity and pressure both are minimum at the narrowest point
- D) its velocity is maximum at the narrowest point and the pressure is maximum at the widest part
- E) its velocity is maximum and pressure is minimum at the narrowest point

Q4: If the displacement of a body moving on a horizontal surface is 151.25 cm in a time interval of 2.25 s, then the velocity of the body in the correct number of significant figures in cm/s is

- A) 6722
- B) 67.22
- C) 67.222
- D) 0.672
- E) 67.2

Q5: The INCORRECT statement is

- A) Forces in nature always occur between pairs of bodies
- B) Action and reaction forces are simultaneous forces
- C) The coefficient of static friction is greater than the coefficient of kinetic friction
- D) Force is always in the direction of motion
- E) A centripetal force acts toward the centre of a circle

Q6: **7.** A bullet of 10 g, moving at 250 m/s penetrates 5 cm into a tree limb before coming to rest. Assuming uniform force being exerted by the tree limb, the magnitude of the force is:

- A) 12.5 N
- B) 625 N
- C) 62.5 N
- D) 125 N
- E) 6250 N

Q7: The kinetic energy of a body is increased by 21%. The percentage increase in the magnitude of its linear momentum is:

- A) 10%
- B) 11%
- C) 1%
- D) 20%
- E) 21%

Q8: A tennis ball of mass 50g thrown vertically up at a speed of 25 m s⁻¹ reaches a maximum height of 25 m. The work done by the resistance forces on the ball is :

- A) 12.5 J
- B) 50 J
- C) 62.5 J
- D) 25 J
- E) 31.25 J

Q9: The Bohr atom model is invalid for

- A) Hydrogen atom
- B) doubly ionized helium atom
- C) deuteron atom
- D) singly ionized helium atom
- E) doubly ionized lithium atom

Q10: Which of the following mixture forms azeotrope?

- A) Phenol-aniline
- B) Nitric acid-water

- C) Ethanol-acetone
- D) Chloroform-acetone
- E) CS₂-acetone

Q11: Electric conduction in a semiconductor is due to

- A) holes only
- B) electrons only
- C) neither holes nor electrons
- D) both electrons and holes
- E) recombination of electrons and holes

Q12: The molecule which has see saw in structure is

- A) NH₃
- B) SF₄
- C) CCl₄
- D) SiCl₄
- E) BrF₅

Q13: Which of the following is used in the treatment of lead poisoning?

- A) EDTA
- B) DMG
- C) Cupron
- D) α -nitroso- β -naphthol
- E) [(Ph₃P)₃RhCl]

Q14: Which of the following is used as an insect attractant?

- A) Propan-1-amine
- B) N,N-Dimethylmethanamine
- C) Propan-2-amine
- D) N, N-dimethylbutan-1-amine
- E) Ethanamine

Q15: Which of the following liquid pairs shows a negative deviation from Raoult's law?

- A) Phenol- Aniline
- B) Acetone-carbon disulfide
- C) Benzene-Toluene
- D) n-hexane- n-heptane
- E) Bromoethane-Chloroethane

Q16: The rate constant of a first-order reaction is $4.606 \times 10^{-3}/s$. The time taken to reduce 20 g of reactant into 2 g is

- A) 300 s
- B) 500 s
- C) 150 s
- D) 400 s
- E) 250 s

Q17: Which of the following material acts as a semiconductor at 298 K?

- A) Iron
- B) Copper oxide
- C) Sodium
- D) Graphite
- E) Glass

Q18: The molarity of a solution containing 8 g of NaOH (Molar mass = 40 g mol⁻¹) in 250 mL solution is

- A) 0.8M
- B) 0.4M
- C) 0.2M
- D) 0.5M
- E) 0.6M

Q19: If three distinct numbers are chosen randomly from the first 50 natural numbers, then the probability that all of them are divisible by 2 and 3 is

- A) $3/350$
- B) $3/175$
- C) $2/175$
- D) $1/175$
- E) $1/350$

Q20: The mean deviation of the numbers 3, 10, 10, 4, 7, 10, and 5 from the mean is

- A) 2
- B) 2.5
- C) 2.57
- D) 3
- E) 3.75

Q21: If $a_1 = 3$ and $a_n = na_{n-1}$, for $n \geq 2$, then a_6 is equal to

- A) 72
- B) 144
- C) 720
- D) 2160
- E) 4320

Q22: If $A = \begin{bmatrix} 4 & -1 \\ 12 & x \end{bmatrix}$ and $A^2 = A$, then the value of x is

- A) -8
- B) -3
- C) 0
- D) 3
- E) 8

Q23: If $2 \sin\left(\frac{\pi}{3} - 2x\right) - 1 = 0$, $0 < x < \frac{\pi}{2}$, then the value of x is

- A) $\frac{\pi}{4}$
- B) $\frac{\pi}{3}$
- C) $\frac{5\pi}{12}$
- D) $\frac{\pi}{12}$
- E) $\frac{\pi}{6}$

Q24: $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^9 x \cos^2 x dx =$

- A) $\frac{2}{3}$
- B) 1
- C) $\frac{1}{11}$
- D) $\frac{7\pi}{6}$
- E) 0

Q25: If $\sin x = \frac{3}{5}$, then the value of $\sec x + \tan x$ is equal to

- A) -2
- B) 3
- C) 0
- D) 2
- E) -3

Q26: The general solution of $\frac{dy}{dx} + y = 5$ is

- A) $-\log|5-y| = x + C$
- B) $-\log|5-y| = e^x + C$
- C) $(5-y)^2 = 2x + C$
- D) $y = \log|x + C|$
- E) $\log|x| + C$

Given the Linear Programming Problem:

Maximize $z = 11x + 7y$

subject to the constraints: $x \leq 3, y \leq 2, x, y \geq 0$.

Q27: Then the optimal solution of the problem is

- A) (3,2)
- B) (3,0)
- C) (0,2)
- D) (1,0)
- E) (0,1)

Q28:

The equation of the straight line, intersecting the coordinate axes x and y are respectively 1 and 2, is

- A) $x+y=3$
- B) $x-2y=-3$

- C) $2x-y=0$
- D) $2x+y=2$
- E) $x-y=-1$

Q29: A train starts from X towards Y at 3 PM (time $t = 0$) with velocity $v(t) = 10t + 25$ kilometers per hour, where t is measured in hours. Then the distance covered by the train at 5 PM (in km):

- A) 70
- B) 140
- C) 35
- D) 60
- E) 55

Q30: The maximum value of $y = 12 - |x - 12|$ in the range $-11 \leq x \leq 11$ is

- A) 12
- B) 11
- C) 10
- D) 9
- E) 35

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