CUET 2025 Mathematics Memory based Question Paper

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1. The feasible region is bounded by the inequalities:

$$3x + y \geq 90, \quad x + 4y \geq 100, \quad 2x + y \leq 180, \quad x, y \geq 0$$

If the objective function is $Z = px + qy$ and Z is maximized at points $(6, 18)$ and $(0, 30)$, then the relationship between p and q is:

(A) $p = 15, q = 12$

(B) $p = 12, q = 15$

(C) $p = 18, q = 10$

(D) $p = 10, q = 18$

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2. If A is a 2×2 matrix and $|A| = 4$, then $|A^{-1}|$ is:

(A) 16

(B) $\frac{1}{4}$

(C) 4

(D) 1

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3. For a matrix A of order 3×3, which of the following is true?

(A) adj$(A) = A^2$

(B) adj$(A) \neq A^2$

(C) adj$(A) = A^T$

(D) adj$(A) = A^{-1}$

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4. If A is a square matrix such that adj(adj$(A)) = A$, then $|A|$ is:

(A) 1

(B) 3

(C) 0

(D) 9

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5. A person wants to invest at least 20,000 in plan A and 30,000 in plan B. The return rates are 9% and 10% respectively. He wants the total investment to be 80,000 and investment in A should not exceed investment in B. Which of the following is the correct LPP model (maximize return Z)?

(A) Maximize $Z = 0.09x + 0.1y$

(B) Maximize $Z = 0.1x + 0.09y$

(C) Maximize $Z = 0.15x + 0.10y$

(D) Maximize $Z = 0.10x + 0.09y$

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6. The angle between vectors $\mathrm{a} = \hat{\imath} + \hat{\jmath} - 2\hat{k}$ and $\mathrm{b} = 3\hat{\imath} - \hat{\jmath} + 2\hat{k}$ is:

(A) $60°$

(B) $90°$

(C) $45°$

(D) $30°$

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7. If vectors $\mathrm{u}, \mathrm{v},$ and w satisfy $\mathrm{u} + \mathrm{v} + \mathrm{w} = 0$, and u and v are unit vectors, while $|\mathrm{w}| = \sqrt{3}$, then the angle between v and w is:

(A) $90°$

(B) $60°$

(C) $120°$

(D) $45°$

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8. Direction cosines of a vector perpendicular to $\mathrm{a} = \hat{\imath} + 2\hat{\jmath} + 3\hat{k}$ and $\mathrm{b} = 2\hat{\imath} - \hat{\jmath} + \hat{k}$ are:

(A) $\frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}}$

(B) $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}$

(C) $\frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}}, \frac{1}{\sqrt{5}}$

(D) $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$