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Department of Management
BBA-Semester V / Backlog
Odd Semester Examination - December 2025

Roll No...

Subject Name: Business Mathematics -2 **Max. Marks: 30**

Subject Code: BBA-SE-05 **Duration: 1.5 Hour**

Section A - Short Answer (4X3=12)

*Note: Attempt any **THREE** Questions. **All questions carry equal marks.***

Q1. Given

$$A = \begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$$

Find the minor and cofactor of the element $a_{2,3}$.

Q2. Define the following terms with respect to probability:
(a) Experiment
(b) Sample space
(c) Event

Q3. Find the Future Value of an ordinary annuity where ₹2,000 is deposited every year for 5 years at 6% interest rate.

Q4. A company sells a product for ₹400 per unit. Variable cost per unit is ₹250 and fixed costs are ₹1,50, 000. Compute:

(i) P/V ratio
(ii) Break-even point (units)

Q5. What are constraints in optimization? Give two real-life examples.

Section B-Long Answer (9X2=18)

Note: Attempt any **TWO** Questions. ***All questions carry equal marks.***

Q1. Solve using matrix inversion method:

$$\begin{cases} 3x + 2y - z = 4 \\ x + y + z = 6 \\ 2x - 3y + 4z = 5 \end{cases}$$

Q2. A box contains 15 blue pens, 10 black pens, and 5 red pens.

Event A: Pen selected is black.

Event B: Pen selected is not red.

Find the probability that the pen is black given that it is not red.

Q3. i) Explain the difference between ordinary annuity and annuity due with formulas.

ii) A company pays ₹25,000 at the beginning of each year for 8 years into a fund earning 6%. Calculate the Present Value.

Q4. A company manufactures Product X with the following details:

i. Selling price per unit: ₹500
ii. Variable cost per unit: ₹300
iii. Current sales volume: 3,000 units
iv. Total fixed costs: ₹8,00,000

Compute the Margin of Safety (MOS) in:

a) Units
b) Sales value
c) Percentage

Q5. Use graphical method to obtain the optimal solution:

Maximize:

$$Z = 250x + 150y$$

Constraints:

$$3x + y \leq 90$$
$$x + 2y \leq 70$$
$$x, y \geq 0$$