

19. (a) Solve the equations :

$$3x - 2y = 5$$

$$5x - y = 3.$$

Or

- (b) In an economy of two industries A and B, the data in millions of rupees is given below :

		Buying sector		Final demand	Total output
		A	B		
Selling Sector	A	18	8	10	36
	B	9	24	15	48

Determine the total output, if the final demand changes to 30 for A and 40 for B.

20. (a) Use Simplex method to maximize $z = x_1 - x_2 + 3x_3$ subject to the constraints :

$$x_1 + x_2 + x_3 \leq 10$$

$$2x_2 - x_3 \leq 2$$

$$2x_1 - 2x_2 + 3x_3 \leq 0$$

$$x_1, x_2, x_3 \geq 0.$$

Or

- (b) Describe the procedure of dual formation of L.P.P.

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M.A. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2012.

First Semester

Economics

MATHEMATICAL METHODS

(For those who joined in July 2012 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

1. What is differentiation?
2. Write the quotient rule of differentiation.
3. What is meant by integration?
4. State any two basic rules of integration.
5. What is meant by null matrix?
6. Define the term determinant.
7. What is inverse matrix?
8. Write the meaning of Input-Output analysis.
9. State the meaning of L.P.P.
10. What do you mean by constraints?

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) If $y = 11x^{-3} + 4x^{-9} + 3x + 7$, find $\frac{dy}{dx}$.

Or

(b) State the basic rules of differentiation.

12. (a) Evaluate $\int \left(x^5 + \frac{1}{x^7} - x - 1 \right) dx$.

Or

(b) Evaluate $\int 4x^2(x^3 + 5)^3 dx$.

13. (a) If $A = \begin{bmatrix} 2 & 0 \\ -5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 6 \\ 4 & 1 \end{bmatrix}$, find $A + B$.

Or

(b) Point out the types of matrices.

14. (a) If $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$, find $|A|$.

Or

(b) Explain the importances of Input-Output analysis.

15. (a) Briefly explain the basic concepts of Linear programming problem.

Or

(b) List out the basic steps to formulation of Linear programming problem.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) Find the maxima and minima of the function $y = x^2 - 4x - 5$.

Or

(b) Find the elasticity of demand and MR at $P = 1$, if the demand function is given by $Q = 7 - 2P$.

17. (a) Evaluate $\int \frac{3x}{(x^2 - 2)^2} dx$.

Or

(b) Find the area beneath the curve $y = x^5$ between $x = 2$ and $x = 3$.

18. (a) Verify whether $AB = BA$ for the matrices

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & -1 & 2 \\ 0 & 1 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & -1 \\ -2 & 0 & 1 \\ 1 & 1 & 2 \end{bmatrix}.$$

Or

(b) Find the inverse of the matrix $A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$.