QP CODE: 25020266

25020266

Reg No : .....

Name : .....

B.A DEGREE (CBCS)) REGULAR/ IMPROVEMENT/ REAPPEARANCE / MERCY CHANCE EXAMINATIONS, FEBRUARY 2025

Fourth Semester

B.A Economics Model I

Complementary Course - MM4CMT04 - MATRIX, LINEAR PROGRAMMING AND INTEGRAL CALCULUS

2017 Admission Onwards

C37D5C3E

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. If $A = \begin{bmatrix} 6 & 5 \\ 8 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 7 \\ 9 & 4 \end{bmatrix}$, find A + B.
2. Find the deteminant of $A = \begin{bmatrix} 8 & 12 \\ 2 & 3 \end{bmatrix}$.
3. What is IS-LM analysis?
4. Write any two types of special determinants.
5. What is an LPP?
6. What are called decision variables in an LPP?
7. Evaluate $\int 4(x-18)^{-2}dx$
8. Write the formula for integration by parts of two functions.
9. Derive the present value of a continuous stream of income at a constant rate of A(t) dollars per year.
10. If z = f(x,y), write the formula for the partial derivative of z with respect to x.
11. What are the cross partial derivatives of a multivariable function f(x,y)?
12. What are called inflection points and saddle points?

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Use Gaussian elimination method to solve the following system of equations:
    3x + 8y + 2z = 67

4x + 6y + 9z = 36

7x + y + 5z = 49

14. Find the inverse of $A = \begin{bmatrix} 13 & -4 \\ -8 & 9 \end{bmatrix}$.

15. Solve the following system of linear equations by finding the inverse matrix of the coefficient matrix.

    3x + 7y = 41

    8x + 9y = 61

16. The basic feasible solutions of the cost function 7x + 28y under a given set of constraints are (0,20), (3,5), (6,2), and (15,0). Find the optimal solution.

17. Using integration by substitution, find $\int 99x^2\sqrt{22x^3+19}dx$

18. Evaluate $\int_2^5 (8x+7)dx$

19. Evaluate $\int_0^2 8xdx$ and $\int_2^5 8xdx$. Hence evaluate $\int_0^5 8xdx$, using property of definite integrals.

20. Given z = $\frac{2x+9y}{8x+7y}$, find both the partial derivatives of z.

21. Given $Y_e = \frac{1}{1-b+z}(C_0 + I_0 + G_0 + X_0 - Z_0)$, find (a) autonomous investment I_0 multiplier. (b) autonomous import Z_0multiplier and the multiplier for the marginal propensity to consume b.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Solve the following system of linear equations using Cramer's rule.

    4x + 2y + 7z = 35

    3x + y + 8z = 25

    5x + 3y + z = 40

23. Solve the following LPP.

    Minimize 15x+12y

    subject to x + 2y $\geq$14

    x + y $\geq$12

    3x+y $\geq$ 18

    x, y $\geq$0

24. Find the area between the curves $y_1 = 2x^2 - 8$ and $y_2 = -2x + 4$from x = -3 to x = 2.

25. Maximize output for a firm operating at constant returns to scale for which the strict Codd-Douglas production function is q = $K^{0.3}L^{0.5}$ when $P_K = Rs.12$, $P_L = Rs.8$ and the production budget is Rs.1280.

(2×15=30)