B. A. DEGREE END SEMESTER EXAMINATION - MARCH 2024
SEMESTER 6 - ECONOMICS
COURSE : **19U6CRECO11-** QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS

(For Regular - 2021 Admission and Supplementary -2020/2019 Admission)

Time : Three Hours   Max. Marks: 75

PART A
Answer All (1 mark each)

1. Define ordered pairs.
2. What is a constant function?
3. What is a random experiment?
4. Define maxima.
5. If A and B are two mutually exclusive events and P(A)= .45 and P(B) = .35, find P (AUB).
6. Show that $\begin{bmatrix} 2 & -1 & 3 \\ -1 & 2 & 1 \\ 3 & 1 & 4 \end{bmatrix}$ is symmetric.
7. If A = {10, 11, 12, 13, 14 } and B = { 10, 12, 14, 15 }. Find A ∩ B?
8. Define consumer price index.
9. What is meant by order of a matrix?
10. Find the marginal utility of the commodities x and y from the total utility function, $U = x^2 + 3xy + y^2$

                                              (1 x 10 = 10)

PART B
Answer any 8 (2 marks each)

11. Find the elasticity of demand from the following functions: i)X= 100-4P ii) $X = 80-2P-P^2$
12. The first term of an Arithmetic Progression is 15 and the last term is 85. If the sum of all terms is 750, what is the 6th term?
13. Distinguish between a rectangular and square matrix.
14. Define diagonal matrix, scalar matrix and unit matrix.
15. Distinguish between variables and constants.
16. List out the essential features of a random experiment.
17. A university has to select an examiner from a list of 50 persons. 20 of them are women and 30 men. 10 of them know hindi and 40 do not, 15 of them are teachers and remaining are not. What is the probability of the university selecting hindi knowing women teacher?
18. Distinguish between Laspeyre's and Paasche's methods of index number.
19. If A = { a, b } and B = { 3, 4 }. What is the Cartesian Product of Two Sets AxB and Bx A. Verify whether they are equal or not?
20. Find the integrals.
    a) $\int (5x^2 - 8x + 5)\, dx$
    b) $\int -6x^3 + 9x^2 + 4x - 3)\, dx$

                                              (2 x 8 = 16)

PART C
Answer any 5 (5 marks each)

21. A box contains six tickets. Two of the tickets carry a prize of Rs.5 each and the other four prizes of Rs. 1 each. (a) If one ticket is drawn, what is the expected value of the prize? (b) If two tickets are drawn, what is the expected value of the prize?

22. Solve the following equation using matrices:

    2x- 3y = 3

    4x- y = 11

23. What is the importance of index numbers?

24. An enquiry in the budgets of middle class families in a village gave the following results. Construct their cost of living index using the family budget method.

Items	% expenses	Price in 1985	Price in 1990
Food	30	180	200
Rent	25	100	120
Clothing	15	70	90
Education	10	40	50
Others	20	70	100

25. Examine the function $y=100+40x-8x^2$ for its maximum or minimum and determine its value.

26. Diya deposited 8000 rupees in a bank, which gives 10% interest compound annually. After 2 years, she withdraw 5000 rupees. After one more year, how much would she have in her account?

27. Explain the terms domain and range citing examples.

(5 x 5 = 25)

PART D
Answer any 2 (12 marks each)

28. 'All functions are relations but all relations are not functions' - Explain.

29. Construct the cost of living index number for 1998 on the basis of 1997 from the following data using (i) aggregate expenditure method and (ii) family budget method:

Items	Quantity consumed	Price(in Rs.) in 1997	Price (in RS.) in 1998
A	50	32	40
B	35	30	42
C	55	16	24
D	45	40	52
E	15	35	42

30. The weekly wages of 1000 workmen are normally distributed around mean of Rs. 70 and with a standard deviation of Rs.5. Estimate the number of workers whose weekly wages will be (i) between Rs. 70 and Rs.72 (ii) Between Rs.69 and 72 (iii) more than Rs.75 (iv) less than Rs.63

31. Find the inverse of the given matrix; $A = \begin{bmatrix} 3 & 5 & 4 & -1 \\ 6 & 3 & -2 & 1 \\ 8 & 6 & 7 & 5 \\ -9 & -9 & 0 & 4 \end{bmatrix}$

(12 x 2 = 24)