Reg. No .... Name **25U602**

B. A. DEGREE END SEMESTER EXAMINATION - MARCH 2025
SEMESTER 6 : ECONOMICS
COURSE : **19U6CRECO11** : QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS
(For Regular 2022 Admission and Supplementary 2021/2020/2019 Admissions)

Time : Three Hours   Max. Marks: 75

PART A
Answer All (1 mark each)

1. What is a power set?
2. Define ordered pairs.
3. Define sample space.
4. Define maxima.
5. What is the peculiarity of a symmetric matrix?
6. Explain the terms variables, constants and parameters with an example.
7. Define null matrix.
8. Define consumer price index.
9. Define random variable.
10. Given the production funtion $q = 10a - a^2 + ab$, determine the marginal productivity with respect to a.

(1 x 10 = 10)

PART B
Answer any 8 (2 marks each)

11. 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?
12. For the data given below calculate simple index number:

Commodities	Price (1995)	Price (2000)
A	5	7
B	8	9
C	12	15
D	25	24
E	3	4

13. Define an equally likely event.
14. What is a triangular matrix? Illustrate an example.
15. Distinguish between necessary and sufficient conditions for maxima and minima.
16. The height of the school children of one institution is normally distributed with mean of 54 inches and S.D of 12 inches. What percentage of students have height between 46 and 56 inches.
17. Differentiate $(x^2 - 1) / (x^2 + 1)$ with respect to $(x-1) / (x+1)$
18. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} -1 & -2 \\ 0 & 4 \\ 3 & 1 \end{bmatrix}$ find the matrix X such that A+B-X=0.

19. What is prime numbers and composite numbers?

20. Distinguish between additive and multiplicative inverse.

(2 x 8 = 16)

PART C
Answer any 5 (5 marks each)

21. Distinguish between weighted and unweighted index numbers.

22. The sum of three numbers in an Arithmetic Progression is 45 and their product is 3000. What are the three numbers?

23. Find simple index number by aggregative method and average relative method from the following prices of five commodities:

Items	Price (2001)	Price (2003)
A	2	4
B	10	11
C	8	7
D	9	11
E	12	15

24. Explain the concepts of maxima and minima of functions. How are they estimated?

25. Write a note on Venn Diagrams.

26. If $A = \begin{bmatrix} 2 & 0 & 4 \\ 6 & 2 & 8 \\ 2 & 4 & 6 \end{bmatrix}$; $B = \begin{bmatrix} 8 & 4 & -2 \\ 0 & 2 & 0 \\ 2 & 2 & 6 \end{bmatrix}$ and $C = \begin{bmatrix} 8 & 2 & 0 \\ 0 & 2 & -6 \\ 8 & 4 & -10 \end{bmatrix}$ compute

    a) A+ (B +C)   b) A - (B - C)   c) 3A + 2B - 3C

27. A speaks truth in 70% cases and B in 85% cases. In what percentage of cases are they likely to contradict each other in stating the same fact.

(5 x 5 = 25)

PART D
Answer any 2 (12 marks each)

28. Solve the following equation using matrices:
    x+y+z = 7
    x+2y+3z= 16
    x+3y+ 4z = 22

29. From the following data construct weighted index numbers using a) Laspeyre's method, b) Paasche's method, c) Fisher's method and d) Marshall- Edgeworth method:

Items	Qunatity in 1987	Quantity in 1998	Price in 1987	Price in 1998
A	6	10	10	12
B	4	8	5	8
C	5	10	10	10

30. What is meant by a function? Elucidate various types of functions.

31. 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

(12 x 2 = 24)