

**B. A DEGREE END SEMESTER EXAMINATION : MARCH 2023****SEMESTER 6 : ECONOMICS****COURSE : 19U6CRECO11: QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS***(For Regular - 2020 Admission and Supplementary - 2019 Admission)*

Time : Three Hours

Max. Marks: 75

**PART A****Answer All (1 mark each)**

1. Define quadratic equation.
2. Define relations.
3. Define subsets.
4. Find the differential coefficient of  $e^x \log x$
5. Define minima.
6. Show that  $\begin{bmatrix} 2 & -1 & 3 \\ -1 & 2 & 1 \\ 3 & 1 & 4 \end{bmatrix}$  is symmetric.
7. If  $A = \begin{bmatrix} 5 & 2 & 3 \\ 4 & 5 & 9 \\ 1 & 4 & 7 \end{bmatrix}$ , find  $A^T$ .
8. A box contains 10 tickets each numbered 1 to 10. A ticket is drawn. What is the sample space?
9. State an example of a mutually exclusive event.
10. Define consumer price index.

**(1 x 10 = 10)****PART B****Answer any 8 (2 marks each)**

11. Distinguish between subsets and proper subsets.
12. In a G.P first term is '1' and 4<sup>th</sup> term is '27' then find the common ratio of the same.
13. At a breakfast buffet, 93 people chose coffee and 47 people chose juice. 25 people chose both coffee and juice. If each person chose at least one of these beverages, how many people visited the buffet?
14. Find the elasticity of demand from the following functions: i)  $X= 100-4P$  ii)  $X=80-2P-P^2$
15. Find the integrals.
  - a)  $\int(5x^2 -8x+5) dx$
  - b)  $\int -6x^3 + 9x^2 + 4x - 3) dx$
16. What is a triangular matrix? Illustrate an example.
17. Given the matrices

$$A = \begin{bmatrix} 2 & 3 & 5 \\ 5 & 4 & 2 \\ 2 & 5 & 9 \end{bmatrix} \quad B = \begin{bmatrix} 5 & -9 & 6 \\ 2 & 3 & -5 \\ 4 & -9 & 7 \end{bmatrix}$$

Find (i)  $A + B$  (ii)  $A - B$

18. 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?
19. Three coins whose two faces are marked 1 and 2, are thrown. Find the expectation of the number obtained.
20. Define time reversal test and factor reversal test.

**(2 x 8 = 16)**

**PART C**

**Answer any 5 (5 marks each)**

21. Explain the terms domain and range citing examples.
22. The sum of three numbers in an Arithmetic Progression is 45 and their product is 3000. What are the three numbers?
23. Define marginal productivity of labour and capital and calculate marginal productivity of labour and capital from the following fuctions: i)  $x=L^2+2L+10$  ii)  $x=K^2+3K^3$  iii)  $x=10K^2L^3$   
iv)  $x=2L^2K+LK+3LK^2$
24. Find the inverse of the following matrix.  

$$\begin{bmatrix} 2 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & -1 & 2 \end{bmatrix}$$
25. The scores of students in a test follow normal distribution with mean = 80 and S.D.= 15. A sample of 1000 students has been drawn from the population. Find (i) appropriate number of students scoring between 65 and 95 (ii) the probability that a randomly chosen student has score greater than 100.
26. Estimate index number for the year 1990 using (i) simple aggregative method (ii) average of price relatives method.

Product	Wheat	Rice	Ghee	Sugar
Price in 1980	4	5	10	5
Price in 1990	6	8	15	8

27. Construct Laspeyre's and Paasche's index numbers for 2000.

Items	Quantity consumed (1999)	Price (1999)	Quantity consumed (2000)	Price (2000)
Wheat	3.00	2.00	2.75	4.00
Gram	0.50	4.00	0.50	6.00
Vegetables	1.00	2.00	1.25	4.00
Meat	0.50	12.00	0.75	16.00
Fish	0.50	4.00	0.50	6.00

**(5 x 5 = 25)**

**PART D**

**Answer any 2 (12 marks each)**

28. Elucidate elementary set theory.
29. Solve the following equation using matrices:  
 $x+y+z = 7$   
 $x+2y+3z = 16$   
 $x+3y+4z = 22$
30. Eight unbiased coins were tossed simultaneously. Find the probability of getting (i) exactly 4 heads (ii) no heads at all (iii) 6 or more heads (iv) utmost two heads (v) number of heads ranging from 3 to 5.
31. 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	Quantity 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

**(12 x 2 = 24)**