

SUBJECT CODE: EC/MC/MM24

B. A. DEGREE EXAMINATION, APRIL 2011  
BRANCH IV - ECONOMICS  
SECOND SEMESTER

COURSE : MAJOR – CORE  
PAPER : MATHEMATICAL METHODS - II  
TIME : 3 HOURS  
MAX. MARKS: 100

SECTION – A

ANSWER ALL QUESTIONS. EACH ANSWER NOT TO EXCEED 50 WORDS:  
(10 X 3 = 30)

1. Evaluate  $AA^T$  if  $A = \begin{bmatrix} 1 & 2 & 0 \\ 2 & 3 & 1 \\ 0 & 1 & 1 \end{bmatrix}$
2. Obtain the value of determinant A if  $A = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 1 & 2 \\ 1 & 5 & 6 \end{bmatrix}$
3. What is an idempotent matrix
4. Find the inverse of the matrix  $\begin{bmatrix} 1 & 2 \\ -1 & 1 \end{bmatrix}$
5. Give the meaning of Input Output model
6. State Hawkins-Simon conditions
7. What are the essential ingredients of a linear programme.
8. What are convex sets?
9. Solve the game given A's Payoff matrix as  $\begin{bmatrix} 4 & 1 \\ 2 & 4 \end{bmatrix}$
10. Briefly explain dominated strategies.

SECTION – B

ANSWER ANY FIVE QUESTIONS. EACH ANSWER NOT TO EXCEED 300 WORDS.  
(5 X 6 = 30)

11. Explain any three properties of determinant giving suitable examples.
12. Obtain the solution for the following set of equations using Cramer's Rule  
 $x+y+z = 45$ ;  $z = x+8$ ;  $x+z = 2y$
13. State the assumptions of Input Output model
14. Solve graphically  $\text{Max } Z = 90X+60Y$   
Subject to  $5X+8Y \leq 2000$   
 $X \leq 175$   
 $Y \leq 225$   
 $7X+4Y \leq 14$   
And X and Y are non negative
15. A diet for a sick person must contain atleast 4000 units of vitamins, 50 units of minerals and 1400 calories. Two foods A and B are available at a cost of Rs. 40 and Rs. 30 per unit respectively. Each unit of A contains 200 units of vitamins . 1 unit of minerals and 40 calories and each unit of B contains 100 units of vitamins, 2 units of minerals and 40 units of calories. Formulate the above problem as a linear programming problem
16. Write a note on hyper planes and supporting planes
17. Write short notes on a. Two person zero sum and two person constant sum game

## SECTION – C

ANSWER ANY TWO QUESTIONS. EACH ANSWER NOT TO EXCEED 1200 WORDS (2 X 20 =40)

18. Find the inverse of the following matrix by cofactor method  $A = \begin{bmatrix} 1 & 10 & 40 \\ 1 & 9 & 30 \\ 1 & 12 & 40 \end{bmatrix}$

19. Given the following input output coefficient matrix obtain the correct levels of output that each industry should produce.

	Steel	Coal	Transport	Final demand
Steel	0.2	0.2	0.1	100 million
Coal	0.4	0.1	0.3	20 million
Transport	0.2	0.5	0.1	40 million
Labour	0.2	0.2	0.5	

20. Solve the following by simplex method

Maximise  $Z = 6X + 4Y$

Subject to  $X + 2Y \leq 720$

$2X + Y \leq 780$

$X \leq 320$  and  $X, Y \geq 0$

21. Solve the game  $\begin{bmatrix} 4 & 1 \\ 2 & 3 \end{bmatrix}$  using expected payoff approach.

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