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QP CODE: 22100734

Reg No : .....

Name : .....

**B.A DEGREE ( CBCS ) REGULAR / REAPPEARANCE EXAMINATIONS,  
APRIL 2022**

**Third Semester**

B.A Economics Model I

**COMPLEMENTARY COURSE - EC3CMT03 - MATHEMATICS FOR ECONOMIC  
ANALYSIS**

2017 Admission Onwards

380CBAE2

Time: 3 Hours

Max. Marks : 80

**Part A**

*Answer any ten questions.*

*Each question carries 2 marks.*

1. Form a matrix

A and B purchased the following from the market

A; 4 kg of sugar, 1 kg of onion and 1 kg of potatoe

B. 2 kg of sugar ,0 kg of potatoe and 5 kg of onion

2. What is order of a determinant

3. Find  $6A - 3B$ .  $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$   $B = \begin{pmatrix} 4 & 2 \\ 1 & 3 \end{pmatrix}$

4. Find the value of the determinant.  $A = \begin{pmatrix} 2 & 3 & -4 \\ 0 & -4 & 2 \\ 1 & -1 & 5 \end{pmatrix}$

5. Define Constants

6. Solve  $4x^2 - 12x + 9 = 0$  use the method of completing squares.

7. Price elasticity of supply

8. Integrate  $\sqrt{x}$





9. What is a dynamic model in input -output analysis
10. When does a static model become dynamic in input-output analysis
11. Mention the uses of LPP
12. What are the advantages of LPP

(10×2=20)

**Part B**

Answer any **six** questions.

Each question carries **5** marks.

13. What is an investment function .Explain with example
14. Draw the average cost curves from the average cost function  $AC=4x+2+20/x$
15. Solve the following equations using matrices  
 $2x-3y=6$   
 $3x-6y=9$
16. Differentiate the following function.  $Y=(3x+2)(2x-1)$
17. Examine the following function for its maxima or minima and determine its value  $y=2x^2-12x+40$
18. What is technological matrix
19. The technological coefficient matrix of two sectors p and q is given below  $A=$   

$$\begin{pmatrix} 0.1 & 0.3 \\ 0 & 0.2 \end{pmatrix}$$
 if the final demands are 10 and 20 respectively find the gross output of the two sectors.
20. Explain step by step how a LPP is solved by Simplex Method
21. Find the dual of the following Primal  

$$\begin{aligned} \text{Max } Z &= 4x_1+2x_2 \\ \text{S.t } & -x_1-x_2 \leq -3 \\ & -x_1+x_2 \geq -2 \\ & x_1, x_2 \geq 0 \end{aligned}$$

(6×5=30)

**Part C**

Answer any **two** questions.





Each question carries **15** marks.

22. Using Cramer's Rule.  $2x-3y+5z=11$ ,  $5x+2y-7z=-12$  and  $-4x+3y+z=5$
23. Using function  $f(x,y)=x^2+y^2-2xy+8x+9y+3$  show that  $(\partial^2 f/\partial x \partial y) = (\partial^2 f/\partial y \partial x)$
24. Minimise the utility function  $U= 4xy -y^2$  subject to a constraint  $2x+y-6=0$
25. A transistor radio company manufactures models A,B,C which have profit contributions of 10,15,20 respectively .The weekly minimum production requirements are 135 for model A,150 for model B and 45 for model C .Each type requires certain time for manufacturing components , assembling and packing.Specially a dozen units of model A requires 3 hours for manufacturing ,3 for assembling ,and 1 for packing.The corresponding for B and C are 3,7,8 .During the forthcoming week the company has available 150 hours of manufacturing 250 hours for assembling and 100 hours for packing.  
Formulate the production schedule using LPP

(2×15=30)

