18103231 **(Pages : 3)** **Reg. No................................**

Name....................................

B.A. DEGREE (C.B.C.S.) EXAMINATION, JUNE 2018

Second Semester

B.A. Corporate Economics (Model III)

Core Course – EC 2CRT 06 – MATHEMATICS FOR ECONOMIST – II

(2017 Admission onwards)

Time : Three Hours Maximum : 80 Marks

Part A

Answer any **ten** *questions.*
Each question carries 2 *marks.*

1. Define Derivatives.
2. What do you mean by Rectifiable curves?
3. What do you mean by Scalar Matrix?
4. What is meant by inverse of matrix?
5. What is null set?
6. If $A = \{1, 3, 5, 7, 9\}$, $B = \{2, 4, 6, 8, 10\}$, $C = \{3, 4, 7, 8, 11, 12\}$.
   Show that $(A \cup B) \cup C = A \cup (B \cup C)$.
7. State any *two* assumptions in Transportation Technique.
8. Write a short note on North West Corner Rule.
9. Distinguish between feasible and basic feasible solutions.
10. What are unbalanced transportation problems?
11. Cite any *two* areas where assignment technique is applied.
12. What are travelling salesmen problems?

($10 \times 2 = 20$ marks)

Part B

Answer any **six** *questions.*
Each question carries 5 *marks.*

13. How will be solve maximisation problems using assignment techniques?
14. Explain some of the areas where Transportation Techniques are employed.
15. Write a note on Vogel's approximation method.
16. Write a note on differentiation of vector valued functions.

17. Write a short note on : (a) Equality of Sets ; (b) Equivalent sets ; and (c) Super set.

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. Solve the equation :

$$x + \begin{bmatrix} 0 & 1 & 5 \\ 1 & 0 & 4 \\ 2 & -6 & 8 \end{bmatrix} = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \\ 3 & 2 & 1 \end{bmatrix}.$$

20. If A = {1, 2, 3}, B = (3, 4, 5}, C = {1, 3, 5}.

Prove that $A - (B \cup C) = (A - B) \cap (A - C)$.

21. Distinguish between Assignment problems and Transportation problems.

(6 × 5 = 30 marks)

Part C

Answer any **two** *questions.*

Each question carries 15 *marks.*

22. Represent the following using Venn diagrams :

(a) $A \cap B$.

(b) $A \cup (B \cup C)$.

(c) $A \cap (B \cup C)$.

(d) $(A \cup B) \cap (A \cup C)$.

(e) $A - (B \cap C)$.

23. Give the matrices :

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

Find (i) A + B ; (ii) A – B.

24. A company is faced with the problem of assigning five jobs to six different machines. The costs are estimated as follows (hundreds of rupees).

Jobs

	1	2	3	4	5
1	2.5	5	1	6	1
2	2	5	1.5	7	3
3	3	6.5	2	8	3
4	3.5	7	2	9	4.5
5	4	7	3	9	6
6	6	9	5	10	6

Solve the problem assuming that the objectives is to minimise total cost.

25. Solve the following Transportation Problem to maximise profit :

Profit in Rs./Unit

Distribution

		A	B	C	D	Supply
	1	15	51	42	33	23
Source	2	80	42	26	81	44
	3	90	40	66	60	33
Demand		23	31	16	30	

(2 × 15 = 30 marks)