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Reg. No.....

Name.....

B.A. DEGREE (CBCS) EXAMINATION, JANUARY/FEBRUARY 2018

First Semester

Corporate Economics

Core—MATHEMATICS FOR ECONOMICS—I

(2017 Admissions)

Time : Three Hours

Maximum Marks : 80

Part A

Answer any ten of the following.

Each question carries 2 marks.

1. What do you mean by linear equations ?
2. What is cumulative law of matrix ?
3. Define Identifier.
4. Define input-output transaction matrix.
5. What do you mean by Row vector ?
6. Solve $3(x + 5) = 21$.
7. What is dual problem in linear programming ?
8. Define determinant.
9. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$, find $|A|$.
10. Define null matrix.
11. What do you mean by trace of a matrix ?
12. What is rank of a matrix ?

(10 × 2 = 20)

Turn over

Part B

Answer any **six** questions.

Each question carries 5 marks.

13. Find $A + B$ if $A = \begin{bmatrix} 2 & 0 \\ -5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 6 \\ 4 & 1 \end{bmatrix}$.
14. Explain the properties of a determinant.
15. What is input-output analysis ?
16. What is the optimal solution of a linear programming problem ?
17. Verify $[A^T]^T = A$, if $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$.
18. Solve $3x^2 - 2x - 1 = 0$.
19. Distinguish between diagonal matrix and scalar matrix.
20. Compute cofactor for the matrix $A = \begin{bmatrix} 5 & 2 & 1 \\ 2 & 1 & 4 \\ 0 & 5 & 6 \end{bmatrix}$.
21. Explain the limitations of input-output analysis.

(6 × 5 = 30)

Part C

Answer any **two** questions.

Each question carries 15 marks.

22. Solve the following linear equations by using Cramer's rule :

$$x + 2y + 3z = 11$$

$$2x - y + 4z = 13$$

$$3x + 4y - 5z = 3.$$

23. Explain the various steps involved in solving a linear programming problem by graphical method. Solve graphically :

$$\begin{aligned} \text{Minimize } C &= 120x_1 + 60x_2 \\ \text{subject to } & 3x_1 + x_2 \geq 15 \\ & x_1 + 5x_2 \geq 20 \\ & 3x_1 + 2x_2 \geq 24 \\ & x_1, x_2 \geq 0. \end{aligned}$$

24. Explain the importance of input-output analysis and its limitations.

25. Solve the following pair of simultaneous equations :

$$\begin{aligned} \text{(a) } 2x + 3y &= 13 \\ 4x - 2y &= 2. \end{aligned}$$

$$\begin{aligned} \text{(b) } 4x + 3y &= 7 \\ 3x - 2y &= 9. \end{aligned}$$

$$\begin{aligned} \text{(c) } 3x - 2y &= 13 \\ 5x + 3y &= 66. \end{aligned}$$

(2 × 15 = 30)