Reg. No ..... Name **24U255**

B. B. A (BUSINESS ANALYTICS) DEGREE END SEMESTER EXAMINATION - MARCH 2024

SEMESTER - 2

COURSE : **23U2CPBBA01 - BUSINESS MATHEMATICS AND QUANTITATIVE TECHNIQUES**

(For Regular - 2023 Admission)

Time : Three Hours Max. Marks: 60

PART A

Answer All (1 mark each)

1. Define the term column matrix.
2. List the additive idendity matrix of a 3X 3 matrix.
3. What is meant by the term most likely time in a project?
4. Define the term irrational number with the help of examples.
5. What is meant by the term optimistic time in a project?
6. Define the term surplus variables.
7. What are artificial variables?
8. Write in exponential form $\text{Log}_2 64 = 6$.

(1 x 8 = 8)

PART B

Answer any 6 (2 marks each)

9. Find the value of x if 3 Log 2 = Log (x+5).
10. Explain the three basic requirements of standard form of an LPP.
11. Find the expression for n^{th} term of a GP with first term a and common ratio r.
12. The sides of a rectangle are in the ratio 1:5. If the perimeter of the rectangle is 144 cms, find the area.
13. Explain the term transpose of a matrix with the help of an example.
14. List the different techniques for network analysis.
15. Find the minor of the element 9 in the determinant $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$
16. The population of a town in a particular year was estimated as 4 Lakhs. If the population is increasing at the rate of 10% annually, what will be the population at the end of 5 years?

(2 x 6 = 12)

PART C

Answer any 4 (5 marks each)

17. Solve the given equation using Cramer's rule.
    12x + 3y = 15
    2x - 3y = 13
18. Find the determinant of the 3x3 matrix A = $\begin{bmatrix} 1 & -2 & -3 \\ 2 & 1 & -2 \\ -1 & 2 & 2 \end{bmatrix}$

19. Solve the given LPP
Maximise Z= 4x+y
The constraints are
$x + y \leq 20$
$3x + 4y \leq 72$
$x,y \geq 0$

20. Explain the additive property of integers

21. Distinguish between PERT and CPM

22. Find the compound interest on Rs. 16,000 at 20% per annum for 9 months, compounded quarterly

(5 x 4 = 20)

PART D
Answer any 2 (10 marks each)

23. Discuss classification of numbers with the help of examples

24. Determine the critical path, critical activity and project completion time for the following data

Activity	Duration in weeks
1-2	2
1-4	2
1-7	1
2-3	4
3-6	1
4-5	5
4-8	8
5-6	4
6-9	3
7-8	3
8-9	5
9-10	2

25. Find the co factor matrix of the 3 x 3 matrix A = $\begin{bmatrix} -1 & -2 & 3 \\ 2 & 1 & 3 \\ -1 & 3 & 2 \end{bmatrix}$

26. A toy manufacturing organization manufactures two types of toys A and B. Both the toys are sold at a profit of Rs.25 and Rs.20 respectively. There are 2000 resource units available every day from which the toy A requires 20 units while toy B requires 12 units. Both of these toys require a production time of 5 minutes. Total working hours are 9 hours a day. What should be the manufacturing quantity for each of the toys to maximize the profits?

(10 x 2 = 20)