

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2024

(Regular/Improvement/Supplementary)

BBA HONOURS

GBAH2B05T: FINITE MATHEMATICS

Time: 3 Hours

Maximum Marks: 80

PART A: Answer all the questions. Each carries one mark.**Choose the correct answer.**

- The value of Probability lies between.....
A) 0 to 1 B) -1 to 0 C) -1 to +1 D) None of these
- In a Maximisation problem, objective function consists of
A) Profit B) Cost C) Constraints D) Slack variables
- The Mean of a Binomial distribution is represented by.....
A) np B) npq C) m D) e^{-m}
- A matrix with the property $A^T = A$ is known as.....
A) Symmetric B) Rectangular C) Triangular D) Unit
- The value of X in the equation: $5[X+2]+7[X+3]= 7$
A) 2 B) -2 C) 0 D) None of these

Fill in the Blanks.

- A diagonal matrix whose diagonal elements are equal is called
- If $P(A) = 1/13$, $P(B) = 1/4$, $P(A \cap B) = 1/52$, $P(A/B) =$
- The probability of getting both head when two unbiased coins are thrown is
- are the variables introduced to convert inequalities of a LPP to equations.
- Breakeven point is the point at which

(10 x 1 = 10 Marks)**PART B. Answer any eight questions. Each carries two marks.**

- What do you mean by Matrices?
- Write a short note on Present Value of Annuity.
- What is the concept of Conditional Probability?
- Write down properties of Binomial Distribution.
- What you mean by Sinking Fund?

(PTO)

16. What do you understand by Feasible Region?
17. Calculate the Simple interest on Rs 200000 for 5 months at 10 % SI per annum.
18. $A = \begin{bmatrix} 2 & 4 \\ -6 & 19 \end{bmatrix}$ $B = \begin{bmatrix} 6 & -4 \\ -5 & -8 \end{bmatrix}$ Find $5A - 3B$.
19. Four coins tossed simultaneously. What is the probability of getting 2 heads?
20. Calculate value of Determinant

$$\begin{vmatrix} 8 & 3 & -1 \\ 7 & 9 & -6 \\ -5 & 4 & 8 \end{vmatrix}$$

(8 x 2 = 16 Marks)

PART C: Answer any six questions. Each carries four marks.

21. Find two positive numbers whose sum is 24 and product is as large as possible.
22. $A = \begin{pmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{pmatrix}$ Prove that $A^2 - 3A + 2I = 0$.
23. A manufacturer of blades knows that 5 % of his product is defective. He sells blades in boxes of 100 and guarantees that no more than 10 blades will be defective. Find the probability that a box will fail to meet guaranteed quality.
24. An animal feed company must produce at least 200 Kgs of a mixture consisting of ingredients A & B . A cost Rs.3 per Kg , B cost Rs.8 per Kg. No more than 80 Kg of A can be used and at least 60 Kg of B must be used. Formulate a mathematical problem.
25. The height of the school Children of one institution is normally distributed with Mean 54 Inches and SD 12 Inches. Find percentage of students having height between 46 and 56 Inches.
26. Find the marginal revenue and average revenue when $X=10$ from the revenue function $Y = 32X - X^2$
27. $A = \begin{bmatrix} 0 & 9 & 9 \\ 5 & 7 & 8 \\ 3 & 1 & 4 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 7 & 9 \\ 0 & 8 & 6 \\ 2 & 0 & 4 \end{bmatrix}$ Find $A^T \cdot B^T$
28. Find the derivative of $(X+3)^2 \cdot (X+4)^3 \cdot (X+5)^4$.

(6 x 4 = 24 Marks)

PART D. Answer any two questions. Each carries fifteen marks.

29. Eight coins were tossed together 256 times. Find the expected frequencies of Heads.

30. Solve the equations using Gauss Jordan method:

$$2X + Y + Z = 10$$

$$3X + 2Y + 3Z = 18$$

$$X + 4Y + 9Z = 16$$

31. Solve the problem using Simplex method:

$$\text{Maximize } Z = 40 X_1 + 80 X_2$$

$$\text{Subject to } 2 X_1 + 3 X_2 \leq 48 ,$$

$$X_1 \leq 15 ,$$

$$X_2 \leq 10 ,$$

$$X_1 , X_2 \geq 0$$

(2 x 15 = 30 Marks)