

20080002020001
EXAMINATION FEBRUARY-MARCH 2024
BACHELOR OF COMMERCE (HONORS)(SECOND SEMESTER)
MATHEMATICS & STATISTICS – II LEVEL 2

[Time: As Per Schedule]

[Max. Marks: 50]

Instructions:

1. Fill up strictly the following details on your answer book

- a. Name of the Examination : **BACHELOR OF COMMERCE (HONORS)(SECOND SEMESTER)**
- b. Name of the Subject : **MATHEMATICS & STATISTICS - II**
- c. Subject Code No : **20080002020001**

2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.
5. Simple calculator can be used.
6. Statistical tables and graph paper would be supplied on request.

Seat No:

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Student's Signature

Q.1 Answer the following questions:

10

- (i) Define linear programming problem.
- (ii) Find Dual of the primal programming problem

$$\text{Max } Z = x_1 - x_2 + 3x_3$$

subject to

$$x_1 + x_2 + x_3 \leq 10$$

$$2x_1 - x_2 - x_3 \leq 2$$

$$2x_1 - 2x_2 - 3x_3 \leq 6$$

$$\text{And } x_1, x_2, x_3 \geq 0$$

- (iii) Define Annuity.
- (iv) Define effective rate of interest
- (v) Solve the following Assignment problem:

Jobs	P	Q	R
A	20	27	30
B	10	18	16
C	14	16	12

Q.2 (a) Explain Matrix Minima Method to solve transportation problem.

4

- (b) A firm is engaged in animal breeding. The animals are to be given nutrition supplements every day. There are two products A and B which contain the three required nutrients 6

Nutrients	Quantity Per unit		Minimum Requirement
	Product A	Product B	
P	72	12	216
Q	6	24	72
R	40	20	200

Product cost per unit are: A: Rs. 40; B: Rs. 80. Find out quantity of product A & B to be given to provide minimum nutritional requirement. Use graphical method.

- (c) Obtain initial basic feasible solution to the following Transportation problem using Matrix Minima Method. 4

	D	E	F	G	Supply
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	950

- Q.3** (a) Explain method to solve Assignment Problems. 4

- (b) Use Simplex method to solve the following Linear Programming Problem: 6

$$\text{Maximize } Z = 40x + 30y$$

$$\text{Subject to } x + y \leq 12, 2x + y \leq 16, x \geq 0, y \geq 0$$

- (c) Solve the following Assignment Problem to minimize total cost 4

	I	II	III	IV	V
A	45	30	65	40	55
B	50	30	25	60	30
C	25	20	15	20	40
D	35	25	30	30	20
E	80	60	60	70	50

- Q.4**
- (a) Explain future value, present value and compound interest. **3**
 - (b) Calculate compound interest on the sum of Rs. 50,000 for 3 years at 6% rate of interest p.a. Also find the amount at the end of period. **3**
 - (c) Sunita deposited Rs 10000 at the end of every year in a bank offering compound interest at 8% p.a. What will be the accumulated sum after 5 years? **3**
 - (d) A scooter was bought at Rs. 42,000. Its value depreciated at the rate of 8% per annum. Find its value after one year. **3**
