

**25/1666****B.C.A. (Fourth Semester)  
Examination, 2025****Fourth Paper****(Optimization Techniques)***Time : Two Hours ]**[ Maximum Marks : 75***Note :** Attempt all sections as per Instructions.**Section-A****(Very Short Answer Type Questions)****Note :** Attempt all the 05 (Five) questions.

Each questions carries 02 (two) marks  
and answer of each question should not  
exceed 50 words.  $5 \times 2 = 10$

1. (a) What is inventory, control? Describe EOQ with a formula.
- (b) Explain the term 'degeneracy' in transportation problems.

**P.T.O.****25/1666**

- (c) What is the significance of artificial variables?
- (d) Define the term 'feasible region' in LPP.
- (e) What is meant by 'service rate'?

**Section-B****(Short Answer Type Questions)**

**Note :** Attempt all the 05 (five) questions out of total 08 (Eight) questions. Each questions carries 05 (five) marks and answer of each question should not exceed 100 words.  $5 \times 5 = 25$

2. (a) Differentiate between FIFO and LIFO service discipline.
- (b) Solve the following assignment problem using Hungarian method.

	A	B	C
P	9	2	7
Q	6	4	3
R	5	8	1

- (c) What is the Big M method? Solve an LPP using this method.

2

25/1666

- (d) Explain ABC analysis and its significance in inventory control.
- (e) Explain the steps involved in solving a two machine sequencing problem.
- (f) A job takes 4 hours on machine A and 5 hours on Machine B another job takes 6 hours on A and 3 hours on B find the best sequence using Johnson's rule.
- (g) In a service system,  $\lambda=4$ hour and  $\mu=5$ hour. Find utilization and system characteristics.
- (h) A clerk serves 9 customers/hour. Arrival rate is 6/hour. Compute Ls and Ws.

### Section-C

#### (Long Answer Type Questions)

**Note :** Attempt any 02 (Two) questions out of total 04 (Four) questions. Each questions carries 20 (Twenty) marks and answer of each question should not exceed 400 words.

2×20=40

3

P.T.O.

25/1666

3. (a) A company requires 6000 units per year. The cost per order is ₹120 and the carrying cost per unit per year is ₹10. The supplier offers a discount of 5% on orders of 1000 units or more. Should the company accept the discount? Show calculations.
- (b) Discuss the difference between finite and infinite population models. Give examples and explain their applications.
- (c) Explain the various types of inventory costs in detail. How do they affect inventory decisions?
- (d) A company sells, 1,000 units/month. Lead time=10 days. Daily usage=40units. Safety stock=200 units.

#### Calculate

- (i) Reorder level
- (ii) Average inventory
- (iii) Maximum inventory level

4