

Exam. Code : 105404

Subject Code : 1469

**BBA 4th Semester  
OPERATIONS RESEARCH**

**Paper—BBA-406**

Time Allowed—3 Hours]

[Maximum Marks—50

**SECTION—A**

**Note :—**Attempt any **TEN** questions. Each question carries 1 mark. Answer to each question should not exceed 5 lines.

1. Short answer type questions :—
- (a) Define linear programming.
  - (b) What are the limitations of operations research ?
  - (c) Differentiate feasible solution and optimal solutions.
  - (d) Explain dual of dual is primal.
  - (e) Explain stepping stone method of transportation problem.
  - (f) Prohibited/restricted assignment problem.
  - (g) What is inventory control ?
  - (h) A company uses 3000 units of a product, its carrying cost is 30% of average inventory. Ordering cost is 100 per order, unit cost is Rs. 20. Calculate EOQ.

- (i) State the similarities between PERT and CPM.  
 (j) Differentiate between pure strategy and mixed strategy.  
 (k) Explain principle of dominance in brief.  
 (l) What is saddle point ? 1×10=10

### SECTION—B

**Note :—** Attempt any **TWO** questions. Each question carries **10** marks.

2. What is operation research ? Briefly explain the characteristics and various steps used in solving operation research problem.

3. Use Simplex to solve :

$$\text{Max } Z = 100 x_1 + 40 x_2$$

$$\text{Sub to : } 40 x_1 + 50 x_2 \leq 900$$

$$3/2 x_1 + 2/3 x_2 \leq 30$$

$$\text{where } x_1, x_2 \geq 0$$

4. A manufacturing company has distribution centers X, Y and Z. These centers have 40, 20 and 40 units of product. Its retail outlets at A, B, C, D and E requires 25, 10, 20, 30 and 15 units respectively. The transport cost in between each centre and each outlet is given in the following table :

	A	B	C	D	E
X	55	30	40	50	40
Y	35	30	100	45	60
Z	40	60	95	35	30

Find out optimum distribution cost.



5. Discuss the impact of quantity discount on EOQ. Narrate the benefits of effective inventory control system. Also discuss how safety stock is calculated.  $2 \times 10 = 20$

### SECTION—C

**Note** :— Attempt any **TWO** questions. Each question carries **10** marks.

6. Compare the PERT with CPM analysis. Also discuss the components of network diagram. What is the difference between forward and backward path computation method ?
7. Discuss the following terms :
- Pay-off matrix and Two person zero sum game.
  - What are the approaches to Game theory ?
8. Estimated times of jobs of a product are given below :

Job	A	B	C	D	E	F	G	H	I	J	K	L
Time	13	5	8	10	9	7	7	12	8	9	4	17

A and B are starts jobs : A controls C, D and E; B controls F and J ; G depends upon C; H depends upon D; E and F control I and L; K depends upon J; L is also controlled by K; G,H, I and L are the last jobs.

Draw the network, determine float for each activity and the project duration.

What is the critical path ?

9. Solve the following game by Dominance principle :

Player B

	I	II	III	IV	V
Player A I	2	3	1	8	0
II	6	5	4	6	7
III	2	4	3	3	8
IV	5	6	2	2	1

2×10=20

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