

Exam. Code : 105404  
Subject Code : 1389

**Bachelor in Business Administration 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) Optimum Solution.
  - (b) Fair Game.
  - (c) Slack Variable.
  - (d) Degeneracy in Transportation.
  - (e) Inventory Control.
  - (f) Limitations of Operations Research.
  - (g) Dual of Dual is Primal.
  - (h) A company uses 6000 units of a product, its carrying cost is 20% of average inventory. Ordering cost is 80 per order, unit cost is Rs. 10. Calculate EOQ.
  - (i) Pure Games.
  - (j) Quantity Discount in Inventory Control.
  - (k) Saddle point.
  - (l) Differentiate between PERT and CPM.

## SECTION—B

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

2. What is operation research ? Briefly explain the scope and importance of O.R. in relation to various business opportunities.

3. Use simplex to solve :

$$\text{Max. } Z \quad 5x_1 + 2x_2 + 10x_3$$

$$\text{Sub. to} \quad x_1 - x_3 \leq 10$$

$$x_2 - x_3 \geq 10$$

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

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

4. Solve the following Assignment Problem :

		JOBS			
		P	Q	R	S
PERSONS	A	85	50	30	40
	B	90	40	70	45
	C	70	60	60	50
	D	75	45	35	55

5. Solve the following transportation problem and check its optimality :

	W	X	Y	Z	Supply
A	5	3	4	2	100
B	1	6	7	10	100
C	3	2	1	5	100
D	8	10	9	3	150
Demand	100	100	100	100	400/450

$2 \times 10 = 20$

## SECTION—C

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

6. Discuss in details the difference between PERT and CPM. Which approach is preferred and why ? What are the assumptions of PERT and CPM kept in mind while drawing the network ?
7. Discuss the following terms with the help of an example wherever suitable :
- Two person zero sum game.
  - Pure and Mixed strategies.
  - Critical Path.
  - Rule of Dominance.
  - Rules for drawing the network.
8. Estimated times of jobs of a product are given below :

Activity	Preceded by	Duration (Weeks)
a	—	10
b	a	9
c	a	7
d	b	6
e	b	12
f	c	6
g	c	8
h	f	8
i	d	4
j	g,h	11
k	e	5
l	i	7

Draw the network.

What is the critical path ?

Calculate the floats for each activity.

9. Solve the following game by Dominance principle :

		Player B			
		I	II	III	IV
Player A	I	6	4	8	0
	II	6	8	4	8
	III	8	4	8	0
	IV	0	8	0	16