

Roll No.

Total No. of Pages : 03

Total No. of Questions : 07

B.Com.(P) (2011 & Onward) (Sem.-3)

OPERATION RESEARCH

Subject Code : BCOP-304

Paper ID : [B1127]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
- SECTION-B** contains **SIX** questions carrying **TEN** marks each and students have to attempt any **FOUR** questions.

SECTION-A**1. Write short notes on :**

- Define Operation Research.
- How does PERT differ from CPM?
- Write the dual of the following L.P. Problem :

$$\text{Maximize } Z = 50x_1 + 120x_2$$

$$\text{Subject to } 2x_1 + 4x_2 \leq 80$$

$$3x_1 + x_2 \leq 60$$

$$x_1, x_2 \geq 0$$

- What is unbalanced assignment problem?
- Calculate EOQ
Annual Demand : 2000 units
Unit Cost = Re.1 : Carrying Cost = 16%
Ordering Cost = Re.10
- Solve the game.

	A	B	C
I	0	20	-60
II	30	-10	-20
III	70	-80	-30

g) Find IBFS by NWCM

	W1	W2	W3	Capacity
P1	5	6	7	140
P2	10	2	4	260
P3	5	2	5	360
Requirement	180	280	250	

h) What are the types of Inventory?

i) There are seven jobs to be processed through a single machine. The operation time in minutes is given below

Jobs	Operations time in minutes
x	12
y	10
z	9
P	7
Q	4
R	2
S	1

Find out optimal sequence only.

j) What is degeneracy in transportation problem?

SECTION-B

2) Solve the following LPP by simplex method :

$$\text{Minimize } Z = x_1 - 3x_2 + 2x_3$$

$$\text{Subject to } = 3x_1 - x_2 + 2x_3 \leq 7$$

$$-2x_1 + 4x_2 \leq 12$$

$$-4x_1 + 3x_2 + 8x_3 \leq 10$$

Where $x_1, x_2, x_3 \geq 0$

3) The time estimates (in weeks) for the activities of a PERT network are given below :

Activity	t_o	t_m	t_p
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14

4-6	2	5	8
5-6	3	6	15

- a) Draw the project network and identify all the paths.
 - b) Critical Path method.
 - c) Calculate the standard deviation and variance of the project.
- 4) a) Solve the following game by Sub game Method.

		B	
		I	II
A	I	2	4
	II	2	3
	III	3	2
	IV	-1	6

- b) Solve the following assignment problem to minimise the cost :

	A	B	C	D
1	15	11	13	15
2	17	12	12	13
3	14	15	10	14
4	16	13	11	17

- 5) Discuss briefly the importance of operations research in decision making.
- 6) Define Inventory. Discuss the role and importance of inventory models for management.
- 7) Given below is a table. Solve it as a transportation problem and test its optimality.

	1	2	3	4	Capacity
A	10	8	7	12	500
B	12	13	6	10	500
C	8	10	12	14	900
Demand	700	550	450	300	