Roll No. .....

Examination May-2014

Total no of page-3

B.Com.Professional

Operation Research

Subject Code: BCOP 304

Paper ID- B1127

Time Allowed: - 03 hrs.

Maximum Marks – 60

Instructions to Candidates:-

1) Section A is Compulsory
2) Attempt any Four questions from Section-B

Section A

Q1)

(a) Explain any five techniques of operation research.

(b) What do you understand by Slack Variable?

(c) Write the dual of the following LP Problem :-

Max. Z $= x_1 - x_2 + 3x_3$

Sub. to $x_1 + x_2 + x_3 \leq 10$

$2x_1 - x_3 \leq 2$

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

$x_1, x_2, x_3 \geq 0$

(d) What do you mean by saddle point?

(e) Calculate E.O.Q –

Annual Demand-2500 Units

Carrying Cost =25%

Unit Cost =Rs.100/-

Ordering Cost =Rs. 100 per Order.

(f) Find IBFS by Lowest Cost Entry Method :-

	W1	W2	W3	W4	Supply
P1	2	3	11	7	60
P2	1	0	6	1	10
P3	5	8	15	9	100
Demand	70	50	30	20	170

(g) What do you understand by Earliest Finish time and Latest Finish Time?

(h) Solve the following game by odds method:-

	B1	B2
A1	1	5
A2	4	2

(i) There are eight jobs to be processed through a single machine. The operation time for each job is given below :

Jobs	A	B	C	D	E	F	G	H
Operation Time (in minutes)	12	24	16	8	20	22	17	9

Find out optimal sequence only.

(j) State three applications of game theory in Marketing

(10x2=20)

Section B

Q2) Solve by Simplex method:-

Maximise Z = $3x_1 + 4x_2 + 6x_3$

Subject to $4x_1 + x_2 + 6x_3 \leq 960$

$5x_1 + 3x_2 + x_3 \leq 640$

$x_1 + 2x_2 + 3x_3 \leq 320$

$x_1, x_2, x_3 \geq 0$

Q3) What are the important techniques used in operations research? Explain their Limitations.

Q4) The characteristics of a project schedule are as given below :

Activity	Time (days)	Activity	Time (days)
1-2	4	4-9	5
1-3	1	5-6	4
2-4	1	5-7	8
3-4	1	6-8	1
3-5	6	7-8	2
		8-10	5
		9-10	7

(i) Construct a PERT Network

(ii) Find the Critical Path.

(iii) Compute Earliest and Latest expected time for each event.

Q5) (i)Explain the dominance principle in game theory using following example:-

		FIRM B			
		B1	B2	B3	B4
	A1	35	65	25	5
	A2	30	20	15	0
FIRMA	A3	40	50	0	10
	A4	55	60	10	15

(ii) Solve the following assignment problem

	1	2	3	4
A	2	10	9	7
B	15	4	14	8
C	13	14	16	11
D	4	15	13	9

Q6) Explain the economic order quantity model? What are its assumptions? What are the practical limitations in using this formula?

Q7) A manufacturer wants to ship 8 loads of his product as shown below. The matrix gives the kilometres from origin to the destination.

		Destination			
		A	B	C	AVAILABILITY
Origin	X	50	30	220	1
	Y	90	45	170	3
	Z	50	200	50	4
	DEMAND	3	3	2	8

Shipping costs are Rs. 10 per load per kilometre. What shipping schedule should be used .Apply MODI method.

(4x10=40)

End