

B.C.A. (2010 COURSE SEM- IV : WINTER - 2017)
SUBJECT : MATHEMATICS – IV (OPERATION RESEARCH)

Day : **Monday**
 Date : **20/11/2017**

W-2017-1645

Time : **10.00 AM TO 01.00 PM**
 Max. Marks : 70

N.B.

- 1) **Q.1 is COMPULSORY.**
- 2) Solve any **FOUR** questions from Q.2 to Q.7.
- 3) Use of non-programmable calculator is allowed.
- 4) All questions carry **EQUAL** marks.

Q.1 Explain the steps involved in Operations Research problems? Also discuss models of Operation Research.

Q.2 Use the graphical method to solve the following LP problem.

Maximize $Z = 5x_1 + 2x_2$
 Subject to $2x_1 + 3x_2 \leq 150$
 $3x_1 \leq 150$
 $5x_2 \leq 200$
 and $x_1, x_2 \geq 0$

Q.3 Solve the problem by NWCR, LCM.

To \ From	D	E	F	Supply
A	6	4	1	50
B	3	8	7	40
C	4	4	2	60
Demand	20	95	35	150

Q.4 Assign workers 1,2,3,4 to jobs A, B, C, D time taken by workers for different jobs are given in the matrix. Find the assignment of workers to jobs that will minimize the total time taken.

Workers	Jobs			
	A	B	C	D
1	45	40	51	67
2	55	40	61	53
3	49	52	48	64
4	41	45	60	55

Q.5 Explain some methods, which are useful for decision making under condition of uncertainty. Illustrate each by an example.

Q.6 Find the sequence to minimize the total elapsed time (in hours) required to complete the following jobs on machine M_1, M_2 in order $M_1 \rightarrow M_2$.

Jobs	Processing Time (mm) on m/c	
	M_1	M_2
J_1	4	8
J_2	5	6
J_3	2	8

Work out the most time effective schedule of the jobs.

Q.7 Write short notes on any **TWO** of the following:

- a) CPM and PERT
- b) Monto-Carlo Technique
- c) Expected Value of Perfect Information (EVPI)

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