

S.D.E.

M.B.A. (I.T.) SEM-III (2013 COURSE) : WINTER - 2017  
SUBJECT: OPERATIONS RESEARCH

Day: Saturday  
Date: 23/12/2017

Time: 10.00 A.M. TO 1.00 P.M.  
Max. Marks: 70

W-2017-4335

N.B:

- 1) Attempt **ANY FOUR** questions from Section-I and **ANY TWO** questions from Section-II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to both the sections should be written in the **SEPARATE** answer book.
- 4) Use of Non-programmable **CALCULATOR** is allowed.
- 5) Graph paper should be provided on request.

SECTION-I

Q.1 Define Operations Research. Explain its limitations in brief. (10)

Q.2 Use the Graphical Method to solve the following L.P.P. (10)

Minimize  $Z = 4x_1 + 4x_2$

Subject to:

$$x_1 + 2x_2 \leq 10$$

$$6x_1 + 6x_2 \leq 36$$

$$x_1 \leq 6$$

$$x_1, x_2 \geq 0$$

Q.3 Solve the following assignment problem for maximization. (10)

Salesmen	Districts				
	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

Q.4 Find I.B.F.S. of the following transportation problem by using. (10)

- i) N.W.C.M.
- ii) V.A.M.

Sources	Destinations				Supply
	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	
S <sub>1</sub>	19	30	50	10	7
S <sub>2</sub>	70	30	40	60	9
S <sub>3</sub>	40	8	70	20	18
Demand	5	8	7	14	

Q.5 Write short notes on **ANY TWO** of the following: (10)

- a) Monte Carlo simulation Technique
- b) Network Analysis
- c) History of Operations Research

P.T.O.

**SECTION-II**

**Q.6** Find the I.B.F.S. of the following transportation problem and test it for optimality. **(15)**

Ware house	Customer				Supply
	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	
W <sub>1</sub>	3	6	8	5	20
W <sub>2</sub>	6	1	2	5	28
W <sub>3</sub>	7	8	3	9	17
<b>Demand</b>	<b>15</b>	<b>19</b>	<b>13</b>	<b>18</b>	

**Q.7** A project has following activities. **(15)**

Activity	Most Optimistic Time t <sub>o</sub>	Most Pessimistic time t <sub>p</sub>	Most likely time t <sub>m</sub>
1-2	1	5	1.5
2-3	1	3	2
2-4	1	5	3
3-5	3	5	4
4-5	2	4	3
4-6	3	7	5
5-7	4	6	5
6-7	6	8	7
7-8	2	6	4
7-9	5	8	6
8-10	1	3	2
9-10	3	7	5

- a) Construct a PERT Network.
- b) Find Critical Path and Variance of each event.

**Q.8** What is degeneracy in transportation problem? How it will overcome? **(15)**  
Explain with suitable example.

\* \* \* \* \*