

S.D.E.

M.C.A. SEM - III : WINTER - 2017
SUBJECT: DECISION TECHNOLOGIES

Day: Saturday
Date: 23/12/2017

W-2017-4426

Time: 10.00 A.M. TO 1.00 P.M.
Max. Marks: 80

N.B.:

- 1) Attempt any FIVE questions from Section –I and any TWO questions from Section –II.
- 2) Figures to the right indicate FULL marks.
- 3) Answer to both the SECTION should be written in SEPARATE answer books.
- 4) Use of non programmable CALCULATOR is allowed.

SECTION-I

Q.1 Compute Spearman's rank correlation coefficient by using the following data: (10)

X	5	7	15	20	18	25	27
Y	9	11	22	19	32	14	11

Q.2 Use bisection method to find the real root of the following equation: (10)
(Perform three iterations). $x^3 - x - 1 = 0$.

Q.3 Solve the following LPP by using graphical method: (10)
Maximize $Z = 4x - 3y$

Subject to

$$x + y \leq 4;$$

$$2x - y \leq -2;$$

$$x \leq 3;$$

$$y \geq 2;$$

such that $x, y \geq 0$.

Q.4 What is decision making? Write the steps in decision making process. (10)

Q.5 Compute median and coefficient of variation by using the following data: (10)

Wages in (Rs. '00')	0-20	20-40	40-60	60-80	80-100	100-120
No. of Workers	5	15	23	37	30	14

Q.6 Solve the following assignment problem to minimize the total cost. (10)

Jobs	I	II	III	IV
Machines				
A	40	50	60	65
B	30	38	46	48
C	25	33	41	43
D	39	45	51	59

P. T. O

Q.7 Write short notes on Any **TWO** of the following: **(10)**

- a) M/M/1 queuing model
- b) Forecasting Techniques
- c) Components of time series

SECTION-II

Q.8 A small retail store buys soap cakes from a distributor at a price of Rs. 2 per cake. Total of 5000 cakes are required per year. It costs Rs. 60 for preparing and sending purchase order, receiving and inspecting goods, stocking and issuing bill- payment, for each order. The cost of carrying inventory works out to be 15% of average inventory. **(15)**

- i) Calculate economic order quantity.
- ii) Find the total cost of inventory.
- iii) If supplier offers 10% discount on cost price for one time purchase of annual required quantity of soap cakes, should it be accepted?

Q.9 Solve the following Transportation Problem for optimum cost. **(15)**

To	D ₁	D ₂	D ₃	D ₄	Supply
From					
O ₁	19	30	50	10	7
O ₂	70	30	40	60	9
O ₃	40	8	70	20	18
Demand	5	8	7	14	

Q.10 Given: **(15)**

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M
Predecessors	-	-	B	C	A,D	D	A,D	E	G,H	I	G	J,K	L
Duration (weeks)	6	5	2	2	2	1	6	5	6	2	4	3	1

- i) Draw a network diagram for the project.
- ii) What is the minimum project duration?
- iii) Find the total float and the free float for each non critical activity.