Sardar Patel University, Vallabh Vadhyanagar
External Examination 2019
F.Y.B.B.A. (ISM) – SEM – II
UM02CBBS07 – Quantitative Techniques

Date : 03-04-2019 Day : Wednesday Time: 02:00 PM TO 04:00 PM   Total Marks: 60

Q-1 (a) Write the definition, assumption and limitations of linear programming problem. [07]

(b) Solve the following linear programming problem by simplex method : [08]
Max $Z = x_1 - x_2 + 3x_3$
Such That $x_1 + x_2 + x_3 \le 10$
$2x_1 - x_3 \le 2$
$2x_1 - 2x_2 + 3x_3 \le 0$
$x_1, x_2, x_3 \ge 0$

OR

Q-1 (a) Solve the following linear programming problem by graphical method : [07]
Max $Z = 6x + 7y$
Such That $2x + 4y \le 48$
$4x + 2y \le 60$
$x, y \ge 0$

(b) Solve the following linear programming problem by simplex method : [08]
Max $Z = 30x + 40y$
Such That $60x + 120y \le 12000$
$8x + 5y \le 600$
$3x + 4y \le 500$
$x, y \ge 0$

Q-2 (a) Solve the following Assignment problem to maximize profit. [07]

	A	B	C	D
P	3	4	11	9
Q	5	7	8	9
R	5	6	6	7
S	4	6	8	8

(b) Solve the following transportation problem by using (1) NWCM (2)LCM [08]

	D	E	F	G	Supply
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	

OR

Q-2 (a) Solve the following assignment problem. [07]

	A	B	C
P	10	7	8
Q	8	9	7
R	7	12	6
S	10	10	8

(b) Solve the following transportation problem by VAM. [08]

	A	B	C	D	Capacity
P	19	30	50	10	7
Q	70	30	40	60	9
R	40	8	70	20	18
Requirement	5	8	7	14	

Q-3 (a) Write the meaning of game, types of game and value of game. [07]

(b) Solve the following game by graphical method. [08]

		Player B	
		B1	B2
Player A	A1	-6	7
	A2	4	-5
	A3	-1	-2
	A4	-2	5
	A5	7	-6

OR

Q-3 (a) Write the meaning of game and also write the limitations of theory of games. [07]

(b) Solve the following game by using dominance rule. [08]

		Player B			
		B1	B2	B3	B4
Player A	A1	3	2	4	0
	A2	3	4	2	4
	A3	4	2	4	0
	A4	0	4	0	8

Q-4 (a) Write the meaning and uses of Statistical Quality Control. [07]

(b) Draw $\bar{X}$ and R chart for the following data and state your conclusion, also give the revised limits for the control of future production. [08]

Sample	1	2	3	4	5	6	7	8	9	10
$\bar{X}$	3290	3180	3350	3370	3280	3240	3260	3410	3310	3510
R	360	210	50	100	50	400	500	200	300	600

[For n=5, $A_2 = 0.58$, $D_3=0$, $D_4=2.11$]

OR

Q-4 (a) Draw np chart for the following data and state your conclusion. Where 250 radios are inspected for 12 days. [07]

Sample	1	2	3	4	5	6	7	8	9	10	11	12
No. of defective items	25	47	23	30	24	34	39	32	35	22	45	40

(b) From a company samples of 400 bottles were taken daily for 15 days. The numbers of defective seals in these bottles are given below. Draw P-chart and state your conclusion. [08]

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Defective seals	28	18	40	42	32	62	50	10	30	22	80	62	76	56	30