

S.D.E.

B.C.A. (2004 COURSE SEM- III : SUMMER - 2018

SUBJECT : COMPUTER ORIENTED DECISIONS MODELS

Day : Saturday
Date : 09/06/2018

S-2018-4355

Time 02.00 PM TO 05.00 PM
Max. Marks : 80

N.B.

- 1) Attempt any FIVE questions from Section – I any TWO questions from Section – II.
- 2) Figures to the right indicate FULL marks.
- 3) Answers to both the sections should be written in SEPARATE answer book.

SECTION – I

Q.1 What is Operations Research? Explain briefly its applications. (10)

Q.2 Use graphical method to solve the following Linear Programming Problem. (10)

$$\text{Maximize } Z = 6x_1 + 4x_2$$

$$\text{Subject to } 2x_1 + 4x_2 \leq 4$$

$$4x_1 + 8x_2 \leq 16$$

$$\text{and } x_1, x_2 \geq 0$$

Q.3 Determine initial basic feasible solution to the following problem using Vogel's Approximation Method: (10)

Source	Destination					Supply
	A	B	C	D	E	
P	3	7	10	10	8	8
Q	3	2	5	6	3	10
R	2	7	9	8	5	7
S	5	9	12	10	8	13
Demand	7	9	10	8	4	

Q.4 Find the optimal assignment for the following cost matrix: (10)

Sales	Areas			
	A ₁	A ₂	A ₃	A ₄
S ₁	11	17	8	16
S ₂	9	7	12	10
S ₃	13	16	15	12
S ₄	14	10	12	11

Q.5 Explain advantages and applications of Linear Programming problem. (10)

P.T.O.

- Q.6** Two jobs J_1 and J_2 have the following processing times on two machines M_1 and M_2 . Work out the most time-effective scheduling. (10)

Jobs	Processing time on machines (minutes)	
	M_1	M_2
J_1	15	20
J_2	22	12

- Q.7** Explain the difference between decision making under risk and uncertainty in decision theory. (10)

SECTION – II

- Q.8** Use the Simplex method to solve the following LPP (15)
- Maximize $Z = 3x_1 + 5x_2 + 4x_3$
- Subject to $2x_1 + 3x_2 \leq 8$
- $2x_1 + 5x_3 \leq 10$
- $3x_1 + 2x_2 + 4x_3 \leq 15$
- $x_1, x_2, x_3 \geq 0$

- Q.9** A project plan is follows: (15)

Activity	A	B	C	D	E	F	G	H	I	J	K	L
Predecessors	-	-	A	B	B	C,D	E	F	G	H	I,J	F
Time	8	2	1	9	4	5	6	3	3	5	2	3

Construct a PERT network and compute the early start, late start and slack time for each activity. Indicate the critical path.

- Q.10** a) Define simulation technique. Give its application. (07)
- b) Explain types of decision models. (08)

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