SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
BCA. END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - V
20UCAET5RM1 - Resource Management Techniques

Total Duration : 2 Hrs 30 Mins. **Total Marks : 60**

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. What is the role of Operations Research in decision making? Explain

2. Solve the following L.P.P by the Graphical Method.
   Max Z = $3x_1 + 2x_2$
   subject to
   -$2x_1 + x_2 \leq 1$
   $x_1 \leq 1$
   $x_1 + x_2 \geq 3$ and $x_1, x_2 \leq 0$

3. Using Vogel's approximation technique, find the optimum cost for the following transportation problem:

	1	**2**	**3**	**4**	**Supply**
I	21	16	25	13	11
II	17	18	14	23	13
III	32	27	18	41	19
Demand	6	10	12	15	

4. Solve the following sequencing problem by giving an optimal solution if passing is not allowed.

		M1	**M2**	**M3**	**M4**
	A	13	8	7	14
Jobs	B	12	6	8	19
	C	9	7	8	15
	D	8	5	6	15

5. State the principal assumptions made while dealing with sequencing problem.

6. Solve the payoff matrix:

	B1	**B2**	**B3**	**B4**
A1	1	7	3	4
A2	5	6	4	5
A3	7	2	0	3

Contd...

7. Draw the event oriented network for the following data:

Event No.:	1	2	3	4	5	6	7
Immediate Predecessors	-	1	1	2,3	3	4,5	5,6

8. Calculate the earliest start, earliest finish, latest start and latest finish of each activity of the project given below

Activity	1-2	1-3	1-5	2-3	2-4	3-4	3-5	3-6	4-6	5-6
Duration (in weeks)	8	7	12	4	10	3	5	10	7	4

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Apply Simplex method to the following L.P.P

   Max z= $4x_1+10x_2$

   subject to

   $2x_1+x_2 \leq 50$

   $2x_1+5x_2 \leq 100$

   $2x_1+3x_2 \leq 90$ and

   $x_1, x_2 \geq 0$.

10. The processing time in hours for the jobs when allocate to the different machines are indicated below. Assign the machines for the jobs so that the total processing time is minimum.

	Machines				
	M1	M2	M3	M4	M5
J1	9	22	58	11	19
J2	43	78	72	50	63
J3	41	28	91	37	45
J4	74	42	27	49	39
J5	36	11	57	22	25

Jobs

11. A ready-made garments manufacturer has to process five items through2 stages of production, viz. cutting and sewing. The time taken for eachof these items at the different stages is given below (in hours):

Processing Time	**Item**	**1**	**2**	**3**	**4**	**5**
	Cutting:	**5**	**7**	**3**	**4**	**6**
	Sewing:	**2**	**6**	**7**	**5**	**9**

Find an order in which these items should be processed so as to minimise the total processing time. Also calculate the various idle times.

Contd...

12. Graphically determine the value of the game and the optimal mixed strategy for the player who has only two alternatives.

	Y1	**Y2**
X1	-4	6
X2	8	-6
X3	5	0

13. Three times estimates(in months) of all activities of a project are as given below:

Activity	**a**	**m**	**b**
1-2	0.8	1.0	1.2
2-3	3.7	5.6	9.9
2-4	6.2	6.6	15.4
3-4	2.1	2.7	6.1
4-5	0.8	3.4	3.6
5-6	0.9	1.0	1.1

a) Find the expected duration
b) Construct project network
c) Determine CP, expected project length and expected variance of the project length

*****