Fourth Semester M.Tech. Degree Examination, June/July 2017
Computer Aided Production and Operation Management

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a.   Write the phases of the OR.   **(04 Marks)**

     b.   A company produces 2 type of hats. Every hat A require twice as much labour time as the second hat B, If the company produces only hat B, then it can produce a total of 500 hats a day, the market limits daily sales of the hat A and hat B to 150 and 250 hats, the profits on hat A and B are Rs.8 and Rs.5 respectively. Solve graphically to get the optimal solution.   **(06 Marks)**

     c.   Solve by simplex method:
Maximize $Z = 5x_1 + 2x_2$
Subject to Constraints $10x_1 + 2x_2 \leq 100$
$$x_1 + 0.5x_2 \leq 600$$
$$x_2 \leq 800$$
$$x_1 \geq 0, x_2 \geq 0.$$
                                                  (10 Marks)

2   a.   Find the initial basic feasible solution for the following problem which of the 3 methods known to you gives the better solution.   **(08 Marks)**

	1	2	3	4	Supply
1	3	1	7	5	300
2	2	6	5	9	400
3	8	3	3	2	500
Demand	250	350	400	200	

     b.   Differentiate between transportation and assignment problem.   **(04 Marks)**

     c.   Four Different jobs can be done on 4 different machines and take down time costs are prohibitively high for change overs. The matrix below gives, the cost in rupees of producing job 'i' on machine 'j'. How should be jobs be assigned to various machines so that the cost is minimized?   **(08 Marks)**

		Machine			
		M_1	M_2	M_3	M_4
	J_1	5	7	11	6
Jobs	J_2	8	5	9	6
	J_3	4	7	10	7
	J_4	10	4	8	3

3   a.   The assembly lines defines the precedence relationship and element times for a new model toy.

Element	Te (min)	Immediate Precedence
1	0.5	-
2	0.3	1
3	0.8	1
4	0.2	2
5	0.1	2
6	0.6	3
7	0.4	4,5
8	0.5	3,5
9	0.3	7,8
10	0.6	6,9

    i)   Construct the precedence diagram for this job.

    ii)   If the ideal cycle time is to be 1.0 min. What is the theoretical minimum number of stations required to minimize the balance delay?

    iii)   Solve the method by largest candidate rule. **(12 Marks)**

b. An item, for which the daily demand is 20 per day, is produced at the rate of 50 units per day. The set-up cost is Rs.100 per cycle and inventory holdings cost is Re.0.02 per unit per day. Find:

    i)   The economic lot size

    ii)   The cycle time and

    iii)   The minimum cost per day. **(08 Marks)**

4 a. List the objectives of the MRP system. **(08 Marks)**

    b. For n jobs on 3 machines A.B.C find the sequence Elapse time and idle time of each machine if the technological order of processing on machines is A.C.B. **(12 Marks)**

Job	A	B	C
1	15	11	6
2	12	14	3
3	11	7	8
4	10	2	5
5	8	10	7

5 a. Write a short note on DMAIC. **(05 Marks)**

    b. Write a short note on cause-effect diagram. **(10 Marks)**

    c. Write a short note on "Decision-theories in capacities planning. **(05 Marks)**

6 a. Differentiate between PERT and CPM. **(06 Marks)**

    b. The following table lists the jobs of network along with their time estimates the time estimates are in days:

Job	t_o	t_m	t_p
1-2	3	6	15
1-6	2	5	14
2-3	6	12	30
2-4	2	5	8
3-5	5	11	17
4-5	3	6	15
6-7	3	9	27
5-8	1	4	7
7-8	4	19	28

    i)   Draw the project network.

    ii)   Find the critical path.

    iii)   Find the probability that the project is completed in 41 days. **(14 Marks)**

7   List and explain briefly the Deming's fourteen point rule in improving total quality.

(20 Marks)

8   Discuss the following related to production and operation management:

    a. Supply chain management

    b. System simulation

    c. Factory of future

    d. Technology innovation in manufacturing. **(20 Marks)**

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