USN | | | | | | | | | | |

12MAR251

Second Semester M.Tech. Degree Examination, June/July 2014

Computer Aided Production and Operation Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. A company produces two types of hats. Every hat A requires twice as much labour time as the second hat B then it can produce a total of 500 hats, if the company produces only hat B and A a day. The market units daily sales of the hat A and B to 150 and 250 hats. The profit on hat A and B to 150 and 250 hats. The profit on hat A and B are Rs.8 and Rs.5 respectively. Solve graphically. **(10 Marks)**

b. Solve the following LPP using simplex method:
$Z_{max} = 10x_1 + 5x_2$
Subject to constraints $4x_1 + 5x_2 \leq 100$; $5x_1 + 2x_2 \leq 80$; x_1 and $x_2 \geq 0$ **(10 Marks)**

2 a. Product 1, 2, 3, 4 and 5 are to be processed on a machine the setup costs in Rs. per change depend upon the product presently on the machines and the setup to be made and are given as follows:
$C_{12} = 16$, $C_{13} = 4$, $C_{14} = 12$, $C_{23} = 6$, $C_{34} = 5$, $C_{25} = 8$,
$C_{35} = 6$, $C_{45} = 20$, $C_{ij} = C_{ji}$ and $C_{ij} = \infty$
for all values of i and j not given in the data. Find the optimum assignment of products in order to minimize the total setup cost. **(10 Marks)**

b. With the help of Least-Square method, develop a linear trend equation for the data shown in the table and
i) Compute the constants a and b in the regression equation.
ii) Forecast a trend value for the year 2002 and 2008.

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Shipments (tons)	2	3	6	10	8	7	12	14	14	18	19

(10 Marks)

3 a. As an example of a rectilinear distance location problem, consider the location of a new plant which will supply raw materials to a set of existing plants in a group of companies, suppose that there are 5 existing plants which have a material movement relationship with the new plant.

Let the existing plants have locations of (400, 200) (800, 500) (1100, 800) (200, 900) and (1300, 300). Furthermore suppose that the number of tons of material movement relationship with the new plant to various existing plants are 450, 1200, 300, 800 and 1500 respectively, then out objective is to determine optimum location for the new plant. Such that the distance moved (cast) is minimized. **(08 Marks)**

b. A proposal has been submitted to replace a group of assembly workers. Each working individually with an assembly line. The following table gives the individual work element:

Element	1	2	3	4	5	6	7	8
Te (min)	1.0	0.5	0.8	0.3	1.2	0.2	0.5	1.5
Immediate predecessors	-	-	1.2	2	3	3, 4	4	5, 6, 7

The demand rate for this job is 1600 units/week (assume 40 hr/wk) and the current number of operations required to meet this demand is 8 using the individual manual workers:
i) Construct the precedence diagram.
ii) Use the Ranked positional weight method to assign work element to stations. What is the balance delay for solutions? **(12 Marks)**

4 a. What are costs associated with inventory policy? Explain. **(10 Marks)**

b. A company uses 25000 units of a component costing Rs.5 per unit. Placing each order costs Rs.90 and the inventory carrying cost is 15% per year of the average inventory. Find EOQ and the annual total inventory cost including materials cost. **(10 Marks)**

5 a. List out the assumptions for sequencing. **(08 Marks)**

b. Find the sequence that minimizes the total elapsed time, idle time and normal time.

Machine	Jobs				
	A	B	C	D	E
M_1	6	8	7	10	6
M_2	3	2	5	6	4
M_3	4	8	6	7	8

(12 Marks)

6 a. What is TQM? What are the scope of TQM? **(05 Marks)**

b. Give the nine fundamental factors affecting quality. **(09 Marks)**

c. Define PERT and CPM and differentiate between them. **(06 Marks)**

7 a. Discuss Deming's 14 points for management. **(10 Marks)**

b. Discuss the different stages in the Bench Marking methodology. **(10 Marks)**

8 Write short notes on:

a. Simultaneous engineering

b. Reverse engineering

c. Factory of future

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

* * * * *