Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 710803N **Date: 19-06-2014**

Subject Name: Computer Aided Production Management

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What are the primary inputs required while designing a layout using CRAFT? Summarize stepwise procedure of obtaining the optimal layout using CRAFT. **08**

(b) Illustrate generalized procedure for operating a retrieval CAPP system with the help of a simplified block diagram. **06**

Q.2 **(a)** Determine the optimal sequence that minimizes total elapsed time (in hours) required in completing the jobs (J_i) given in table below; **07**

	J_1	J_2	J_3	J_4	J_5	J_6	J_7
A	10	8	12	6	9	11	9
B	6	4	6	5	3	4	2
C	8	7	5	9	10	6	5

The order of processing for each job is same (A-B-C). Calculate total elapsed time and job waiting time.

(b) The demand for a particular item during ten months of a year is given as below. **07**

Month	1	2	3	4	5	6	7	8	9	10
Demand (units)	213	201	198	207	220	232	210	217	212	225

The manager is considering how well exponential smoothing serves as an appropriate technique in forecasting the demand of this item. The manager is trying three values of smoothing constants; Ŭ= 0.2, Ŭ= 0.5 and Ŭ= 0.8. You are required to calculate (a) forecasted values for every period using each of the given Ŭvalues. Assume initial forecast as 208 units. (b) MAD for each of these series of estimates to suggest most suitable value of smoothing constant.

OR

(b) Obtain least squares regression equation of *Y* on *X* using following data; **07**

X	89	86	74	65	64	63	66	67	72	79
Y	92	91	84	75	73	72	71	75	78	84

Using regression equation obtained, forecast the values of *Y* when
(i) X=70 and (ii) X=85.

Q.3 **(a)** Identify logical part families and machine groups for the part-machine incidence matrix given in following table using Rank Order Clustering (ROC) algorithm. The parts in table are identified by letters, and machines are identified numerically. **07**

	Parts					
Machines	A	B	C	D	E	F
1	1				1	
2				1		1
3	1	1				
4			1	1		
5		1			1	
6			1	1		1

(b) Compare contact inspection techniques with non-contact inspection techniques. **07**

OR

Q.3 **(a)** Explain the meaning of following terms in context of group technology using suitable examples; **07**

1. Composite Part
2. Part Family

(b) Three points on the surface of a drilled hole have been measured by a CMM in the XY axes. The three coordinates are: (34.41, 21.07), (55.19, 30.5) and (50.1, 13.18) millimeters. These coordinates are corrected for probe radius. Determine, **07**

1. Coordinates of hole center
2. Hole diameter as computed by CMM software.

Q.4 **(a)** Explain the meaning of following terms in context of MRP; **07**

1. Bill of Material
2. Common use items
3. Lead Time

(b) What is Production Flow Analysis? State and explain the methodology of Bond Energy Algorithm used in machine cell formation. **07**

OR

Q.4 **(a)** Differentiate between following terms used in MRP; **07**

1. Aggregate Production Plan and Master Production Schedule (MPS)
2. Material Requirement Planning (MRP) and Manufacturing Resource Planning (MRP II)

(b) Explain the generic model of ERP system using schematic block diagram indicating flow of information. **07**

Q.5 **(a)** Differentiate between qualitative and quantitative forecasting models. Explain Delphi technique for making forecasts. **07**

(b) Explain the need of computer generated time standards in shop floor control. **07**

OR

Q.5 **(a)** What is meant by adaptive forecasting system? Illustrate the advantages and limitations of Box-Jerkin Method for forecasting. **07**

(b) What do you mean by simulation? Explain the generalized methodology of simulation using suitable example from manufacturing industry. **07**

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