Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name : Computer Aided Production Management
Subject Code : 5TE01CPM1 Branch :M.Tech (CAD/CAM)

Semester :1 Date :23/12/2015 Time :10:30 To 1:30 Marks : 70

Instructions:

(1) Use of Programmable calculator and any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

SECTION – I

Q-1 **Attempt the Following questions** **(07)**

a. What do you mean by 'noise' in forecasting?
b. What a negative and positive 'Bias' indicates in measurement of forecast error?
c. Define seasonality index.
d. Which basic cost is considered in location and layout planning?
e. List the factors you will consider for locating a thermal power plant.
f. What is 'balance delay' in balancing of assembly lines?
g. Which two key decisions determine the inventory level of any product?

Q-2 **Attempt all questions** **07**

a The demand for electric motors during the last 10 weeks has been 35, 40, 38,50,42,44,56,52,48,50.Make the forecast for the 11^{th} week by 3-weekly moving average methods. Prepare a C program for the same.

b Explain the forecasting techniques other than just the statistical analysis of past data. **07**

OR

Q-2 **Attempt all questions** **07**

a A new plant to be established will receive raw material from three suppliers P, Q & R and supply finished products to three warehouses U, V & W. The sources of raw material and the destination points may be considered as the existing facilities. The coordinates of the existing facilities and the amount of material movement between the existing facilities and the new facility are as follows:

Sr. No	Existing facility	Coordinates: X	Y	Material movement to and from new facility
1	P	400	300	600
2	Q	200	500	400
3	R	300	100	500
4	U	100	550	300
5	V	500	400	600
6	W	350	600	600

Find the optimal location and total cost for the new plant.

b A computer center has four jobs to be performed during a shift. Each job undergoes two stages of operation which is fixed. The list of the jobs to be processed along with time (minutes) for each job **07**

is given below.

Stage	Job			
	A	B	C	D
I	28	21	50	18
II	49	47	21	36

Find a job sequence to reduce total time to be taken for all jobs and the min. total time.

Q-3 **Attempt all questions** **07**

a The processing times of 100 gears for the three conversion processes are given below:

Gear	Processing Time (Hours)		
	Blanking	Gear Cutting	Gear Shaving
G1	25	16	20
G2	26	20	19
G3	24	17	18
G4	22	20	21
G5	24	21	17
G6	28	18	13

In what sequence should gears be scheduled to minimize processing time of all gears? b) Determine the elapsed time and find % utilization of the machines in the first 100 minutes.

b Derive an equation to find simple EOQ inventory model. **07**

OR

Q-3 **Attempt all questions**

a The demand for a product is 18000 units per year. The production rate for the product is 4000 units per month. The set up cost is Rs. 5000 per cycle and the inventory carrying cost amounts to Rs. 0.50 per unit per month. The shortage cost is estimated to be Rs. 5 per unit per month. Determine the optimal manufacturing quantity and the time between set-up cycles. **07**

b What is Buffer stock? List the reasons for keeping a buffer stock. **07**

SECTION – II

Q-4 **Attempt the Following questions** **(07)**

a. How will you define 'shortage cost' in inventory control?
b. What is the basic difference between MRP I and MRP II?
c. Which items stand as class A items in ABC analysis?
d. Give an example of LCFS (Last Come First Served) heuristic rule in production scheduling and sequencing.
e. Give at least two points which distinguish between a mathematical model and a simulation model.
f. Write the application of 'Arrays' in C programming.
g. Write a C program to print one line of text.

Q-5 **Attempt all questions**

a What is product structure for a final assembly? Explain with suitable example. **07**

b What are the differences between independent and dependent demand for products? Is the forecasting technique for dependent items, in any way, different from that of items with independent demand? **07**

OR

Q-5 **Attempt all questions**

a Explain the generic model of ERP system and its selection. **07**

b With neat sketch explain the flow of information in Shop Floor Control System. **07**

Q-6 **Attempt all questions**

a The weight of a product has a normal distribution with a mean of 150g and a standard deviation of **07**

15g. Find, by simulation, the sample mean and the sample standard deviation for a sample size of four, consider random numbers.

b Experiments reveal that the weekly demand for a product has a Poisson distribution with a given mean. How will you simulate the demand using a table of random numbers? **07**

OR

Q-6 **Attempt all Questions**

a a) A company manufacturing Tractors finds that there exists a relationship between the sale of tractors and the index of agricultural income. The following data has been collected by the company for the last five years. **07**

Year	1989	1990	1991	1992	1993
Agricultural Income Index	100	112	130	150	180
Sale of Tractors(in '00 nos.)	125	140	160	190	230

i)Fit a regression equation for the relationship between the sale of Tractors and the Index of agricultural income.

ii) Estimate the sale of Tractors for the year 1994 for the given Agricultural income index of 250.

b Write a note on detailed capacity planning. **07**