MAY 2017 / 01.06.2017

Q. P. Code : 793400

(3 Hours) Total Marks 80

N.B. : (1) Question No. 1 is compulsory.
(2) Answer any **three** questions out of the remaining **five** questions.
(3) Figures to the right indicate full marks.
(4) Illustrate answers with neat sketches where ever required.
(5) Answers to the questions should be grouped and written together.
(6) Assume suitable data if required.

Q 1. Answer any four

(a) What is Production planning and control? 5

(b) Describe Work Order. 5

(c) Define: Cost of Carrying the inventory; Cost of Holding the inventory; Lead Time and Economic Order Quantity 5

(d) What problems are faced in case of lack of product planning? 5

(e) A firm produces three products A, B and C and their unit contributions are Rs. 5/- ; Rs. 10/- and Rs. 8 respectively. Each unit of product A requires 3 kg of material, 5 machine hours and 2 labour hours; each unit of product B requires 4 kg of material, 4 machine hours and 4 labour hours and each unit of product C requires 2 kg of material, 4 machine hours and 5 labour hours. Everyday 60 kg of material 72 machine hours and 100 labour hours are available. From the above information formulate linear programming problem. 5

(f) List the differences between PERT and CPM. 5

Q 2. (a) Explain in detail job, batch and continuous production? 10

(b) Discuss the prerequisites of PPC. 10

Q 3. (a) Automatic gear, manufacturers a wide variety of gears for the replacement market. Since variety is large it allows orders to accumulate before undertaking manufacture of any gear. The firm estimates that back orders cost on the average Rs. 5/ unit for record keeping. 10

i.How many units should the firm produce in each production run of a gear for which following data is available

Annual consumption = 18,000 units
Manufacturing cost per unit= Rs. 48/-
Set up cost per production run = Rs. 480/-
Inventory carrying cost as a percentage of average inventory = 18% of investment

ii. Determine the units that can be back ordered at the indicated shortage cost

iii. How much will the company lose if no stock outs are permitted?

[TURN OVER]

(b) Write short notes on any three 10

I. ABC Analysis
II. MRP I
III. MRP II
IV. ERP

Q 4. (a) What do you understand by process planning? Compare Manual Process planning with Computer Aided Process Planning. 10

(b) Estimate the Sales Forecast for the Year 2016, using Exponential Smoothing Forecast. Take $\alpha = 0.5$ and 0.8 The forecast for the year 2011 is 160×10^5 units. 10

Year	2011	2012	2013	2014	2015
Sales in Rs. ($\times 10^5$)	180	168	159	170	188

Compare the two forecasts.

Q 5. (a) Solve the LPP 10

Maximize $Z = 7X1 + 9X2$

Subject to

$-X1 + 3X2 \leq 6$

$7X1 + X2 \leq 35$

$X1, X2 \geq 0$

(b) Company has one surplus truck in each of the cities A, B, C, D, E and one deficit truck in each of the cities 1,2,3,4,5,6. The distance between the cities in Km. is shown in the matrix below. Find the assignment of trucks from cities surplus to cities in deficit so that the total distance covered by vehicles is minimum. 10

	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

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Q 6. (a) Five jobs are lined up to be processed through a multi spindle automat in the plant. They are labeled as A, B, C, D and E in order they enter the plant. The respective processing times and due dates are given in the table below : 10

Job	Processing Time (days)	Due Date (days)
A	09	55
B	32	50
C	28	28
D	03	24
E	05	20

From the above information prepare the table showing :

Average completion time, Average number of jobs in the system and average job lateness based on FCFS, SPT, LPT and EDD sequencing rules.

(b) The following table showing details of a project -- 10

Activity	Immediate Predecessor	Normal		Crash	
		Time Days	Cost (Rs.x 10^3)	Time Days	Cost (Rs.x 10^3)
A	--	10	20	7	30
B	--	8	15	6	20
C	B	5	8	4	14
D	B	6	11	4	15
E	B	8	9	5	15
F	E	5	5	4	8
G	A,D,C	12	3	8	4

Indirect Cost is Rs.400 Per Day. Find the optimum duration and the associated minimum Project Cost.
