2012

PRODUCTION MANAGEMENT

Paper : 202

(New and Old Syllabi)

Full Marks : 70

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer *any* **five** questions

1. *(a)* Discuss any three technological advancements in the field of production and manufacturing. 7

(b) Visualize and define the conversion process of a tea manufacturing unit. 7

2. *(a)* What are various stages involved in designing of a product? 7

(b) What layout, do you feel, is suitable for any product that is produced in bulk and at the same time all sub-components used in manufacturing the product is also being manufactured by the same manufacturer? 7

3. *(a)* How does the gradual replacement inventory model overcome the practical disadvantage of a simple lot size formula?

(b) Daily demand for a product is normally distributed with a mean of 40 units and a standard deviation of 6. Supply is certain with a lead time of 4 days. The procurement cost of an order is Rs 225 and carrying cost is 60% of unit price of Rs 6. A service level of 90% is required for customers who place order during the reorder period (300 working days). Determine the operating doctrine. [For service level of 90%, $Z = 1 \cdot 28$] 7

4. From the information given below, evaluate whether Thomson algorithm can be applied to the three-machine problem :

Name of Task	*Time in Machine 1 (Mins)*	*Time in Machine 2 (Mins)*	*Time in Machine 3 (Mins)*
A	11	8	10
B	14	5	9
C	9	7	6
D	16	8	12
E	20	9	4

If Thomson algorithm is applicable, then find the sequence of tasks and idle times in each of the machines. 14

5. *(a)* Discuss the algorithm of a double-sampling plan. 5

(b) Examine the data given below and compute the UCL and LCL of a mean chart and range chart from the data : 9

Sample No.	*Observations*				
	I	II	III	IV	V
1	40	25	17	19	41
2	35	30	22	27	44
3	28	33	43	24	47
4	55	18	51	24	50
5	26	42	37	33	31
6	37	29	31	45	28

Given

For : $N = 6,\ A_2 = 0 \cdot 483,\ D_3 = 0, D_4 = 2 \cdot 004$

$N = 5,\ A_2 = 0 \cdot 577,\ D_3 = 0,\ D_4 = 2 \cdot 114$

6. 50 units of finished product *A* are required in the 5th week and another 50 units are required in the 8th week. Product *A* has a lead time of 1 week and there are 50 units available in hand. Product *A* has two sub-components—*B* with a lead time of 2 weeks and *C* with a lead time of 3 weeks. 2 units of *B* and 6 units of *C* are required for 1 unit of *A*. There are 120 units of *B* and 150 units of *C* available in hand. 1 unit of subcomponent *B* requires 8 units of another sub-

component *D*. *D* has a lead time of 1 week and quantity available in hand is 120 units.

From the information provided, construct the product structure tree and work out the MRP for the given information. 14

7. Write short notes on any *two* of the following topics : 7×2=14

(a) JIT philosophy

(b) Total quality management (TQM)

(c) Line-balancing problem

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