M.E. Second Semester (Production Technology & Management) (P.T.) (CBS)

13534 : Production Management : 2 SPTM 1

P. Pages : 3

Time : Three Hours

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AW - 3694

Max. Marks : 80

Notes :
1. Answer **three** question from Section A and **Three** question from Section B.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of non programmable calculator is permitted.
5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION – A

1. a) "Production management comprises a group of activities which facilitates the effective implementation of production function". Comment. **5**

b) Sales data of past 9 years of XYZ company ltd manufacturing consumer durables is given below: **8**

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales ('000)	15	20	21	28	31	32	33	37	42

Forecast the sales for next three years using least square method. Use straight line equation for linear forecasting.

2. a) Discuss various factors influencing capacity planning. **5**

b) A company manufacturing washing machine establishes a fact that there is a relationship between sales of washing machines and population of area. The data collected by market research team is as follows: **8**

Population (Lakhs)	5	7	15	22	27	36
Demand of washing m/cs ('00)	28	40	65	80	96	130

Fit a linear regression equation and estimate the demand for washing machines for the area with a population of 45 lakhs.

3. a) Explain briefly the methods of Aggregate planning with their advantages and limitations. **5**

b) Five jobs are to be processed in a manufacturing industry. The processing times for the jobs are given below. **9**

Jobs	V	W	X	Y	Z
Processing time (Days)	4	17	14	9	11
Due date (in days from start)	6	20	18	12	12

Applying SPT and FCFS priority rules determine.

i) Average flow time.
ii) Average number of jobs in system each day.
iii) Average job lateness.

4. a) Explain the concept of forward and Backward scheduling. **6**

b) A milling machine is used for milling operation and it takes 30 minutes to process the job. Efficiency of milling machine is 90% and scrap is 20%. The desired output is 600 parts/week. Consider 48 hours productive hours per week. Determine the number of milling machines required. **7**

5. a) What is production system? Distinguish between intermittent and continuous production system. **5**

b) A company intends to purchase a machine. A comparative analysis of machine A and machine B is given below. **8**

Particulars	Machine A	Machine B
Investment	Rs. 75000	Rs. 80000
Interest on capital invested	10%	15%
Hourly wages (Wages + Power)	Rs 10	Rs 8
Annual operating hours	2000	2000

If run for whole year, which machine will lower the cost per unit? If 5000 parts are to be produced in a year, which machine would give lower cost per piece?

SECTION – B

6. a) A manufacturing company is setting an assembly line to produce 192 parts per eight hours shift. Following is the information related to times and immediate predecessors of work elements: **9**

Work element	Time (Seconds)	Immediate Predecessor
A	40	None
B	80	A
C	30	D, E, F
D	25	B
E	20	B
F	15	B
G	120	A
H	145	G
I	130	H
J	115	C, I

i) Construct the precedence diagram.
ii) Determine number of workstations and assignment of elements to their stations using any one line balancing method.

b) What is 'Materials management'? Explain the functions and scope of materials management. **5**

7. a) Explain the steps in the process of purchasing for a manufacturing organisation. **5**

b) A manufacturing company requires 10000 units of raw material annually. The cost of raw material per unit is Rs. 5. Ordering cost per order is Rs. 35. Inventory carrying cost is estimated at 10% of average inventory per annum. **8**
Determine:
i) Economic order Quantity.
ii) Optimum number of orders to be placed per annum.
iii) Minimum total inventory cost per year including material cost.

8. a) Explain the functions of a 'Store' in a manufacturing organisation. **5**

b) A manufacturing company requires 2400 units of raw material per year. Ordering lead time is 30 days. Safety stock maintained is equal to one Month's consumption. Inventory carrying cost is 20% of average inventory. Ordering cost is Rs. 100 per order and cost of raw material is Rs. 50 per unit. Determine. 8

1) Optimal order quantity. 2) Reorder level.
3) Average inventory level. 4) Maximum inventory level.

9. a) Distinguish between standardization, simplification and Diversification with suitable examples. 5

b) Derive the following mathematical expression for Economic order Quantity for instantaneous stock replenishment model. 8

$$Qo = \sqrt{\frac{2D\,Co}{Ch}}$$

Where,

D = Annual demand
Co = ordering cost/order
Ch = Inventory carrying cost
Qo = Economic order quantity

10. a) Explain with suitable examples the following methods used for pricing material issues. 7

i) LIFO ii) FIFO

b) What is selective control of Inventory? Explain various techniques of selective control of inventory in brief. 6

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