# Second Semester M. E. (PTM') PT Examination 

PRODUCTION MANAGEMENT
2 SPTM 1
P. Pages: 5

Time : Three Hours ]
[ Max. Marks : 80
Note : (1) Answer any Three questions from Section $A$ and any Three questions from Section $B$.
(2) Due credit will be given to neatness and adequate dimensions.
(3) Assume suitable data wherever necessary.
(4) Illustrate your answer wherever necessary with the help of neat sketches.

## SECTION A

1. (a) Discuss the analysis of correlation and Regression.
(b) $\Lambda$ survey was conducted to study the relationship between the sales and advertisement expenditure.
Estimate :--
(i) The sale for advertising expenditure for Rs. 90 lakhs
(ii) The advertising expenditure for a sale target of Rs. 25 crore and
(iii) Their co-relation.

| Sales in Rs. <br> (Crore) | 10 | 11 | 13 | 15 | 16 | 19 | 14 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Advt Expenditure <br> Rs. (Lakhs) | 60 | 62 | 65 | 70 | 73 | 75 | 71 |

2. (a) Explain how Delphi technique deliver consensus forcast.
(b) Historical data on the sale of tractors of a company for the year 2001 to 2007 is given below. Use Regression analysis technique.

| Year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Salcs (units) | 3286 | 4751 | 5867 | 4580 | 5020 | 8444 | 11072 |

(a) Establish the equation of the straight line satisfying the historical data.
(b) Extrapolate the trend for the year 1994 ignoring the effect of seasonal and random flucturations.
3. (a) Give classification of production system (type of production) based on Quantity (volume) of production. Give suitable examples.
(b) A company intend to buy a machine having a capacity to produce $1,70,000$ good parts per annum. The machinc constitutes a part of the total product line. The system efficiency of the product line is $90 \%$.
(i) Find the system capacity.
(ii) The time required to produce each part is 100 sec and the $\mathrm{m} / \mathrm{c}$ works for $1000 \mathrm{hrs} / \mathrm{year}$. Compute the $\mathrm{O} / \mathrm{P}$ of the $\mathrm{M} / \mathrm{c}$ if the utilization of $\mathrm{m} / \mathrm{c}$ is $60 \%$ and efficiency of $\mathrm{m} / \mathrm{c}$ is 907 . .
(iii) Calculate the No. of machines required.
4. (a) Discuss the advantages and disadvantages of various aggregate planning methods.
(b) Jobs arriving at shop are processed having due date as shown.

| Waiting Job <br> (No of order) <br> arrived | 111 | 112 | 113 | 114 |
| :--- | :---: | :---: | :---: | :---: |
| Processing time <br> (days) | 12 | 11 | 14 | 02 |
| Due date (in days <br> from now) | 20 | 20 | 18 | 08 |

(i) How many processing scquences are possible for there 4 Jobs ?
(ii) Find out av. Job lateness by applying FCFS and SPT priority sequencing role.
5. (a) Explain the following parameters of line balancing :-
(i) Balance delay.
(ii) Line efficiency.
(b) A ten station transfer machine has an ideal cycle time of 60 sec . The frequency of line stop is $F=0.065$ stops/cycle. When the line stop occure the av. down time is 5.0 min . The cast element associated with the transfer lines are raw work part cost $=$ Rs. $0.55 /$ Piece, line operating Cost $=$ Rs. $45 / \mathrm{hr}$ and cost of disposable tooling $=0.37 /$ piece
compute :-
(i) Av. production rate.
(ii) Line efficiency.
(iii) Proportional down time.
(iv) Av cost of W/P.

## SECTION B

6. (a) Specify the relationship between standardization, simplification and specification.
(b) The table below define the precedence relationship and element time of a Job.

| Work element | Te <br> $(\mathrm{min})$ | Immediate <br> Predecessor $)$ |
| :---: | :---: | :---: |
| 1 | 1.00 | - |
| 2 | 0.6 | 1 |
| 3 | 1.6 | 1 |
| 4 | 0.4 | 2 |
| 5 | 0.2 | 2 |
| 6 | 1.2 | 3 |
| 7 | 0.8 | 4,5 |
| 8 | 1.0 | 3,5 |
| 9 | 0.6 | 7,8 |
| 10 | 1.2 | 6,9 |

The ideal cycle time $=2.5 \mathrm{~min}$
(i) Construct the precedence diagram.
(ii) Determine ideal no. of workstations.
(iii) Detetmine the no. of $\mathrm{w} / \mathrm{s}$ using largest candidate rulc.
7. (a) In a manufacturing industry, classify the purchases and discuss the various objective of purchasing functions.
(b) Explain the following methods used for pricing the material issues.
(1) ITFO
(2) LIFO
(3) Av. cost method.
(4) Replacement price method.
(5) Standard price method.
(6) Actual price method.
(7) Inflated price method:
8. (a) What is EOQ? Derive an expression for the EOQ when stock replenishment is instantaneous giving assumptions made.
(b) The following information is known about a group of items, Classify the items as $\mathbf{A}, \mathrm{B}$, and C .

| Item No | Annual consumption <br> in pieces | Unit Price <br> in Rs. |
| :---: | :---: | :---: |
| 1 | 30 | 10 |
| 2 | 280 | 15 |
| 3 | 03 | 10 |
| 4 | 110 | 05 |
| 5 | 04 | 05 |
| 6 | 220 | 10 |
| 7 | 15 | 05 |
| 8 | 80 | 05 |
| 9 | 60 | 15 |
| 10 | 08 | 10 |

Mark the cut off paint's $X$ and $Y$ where the curve changes its shape and the class of control required.
9. (a) What is purchasing management? Draw a flow chart of purchasing activity.
(b) A factory requires 1500 units of an item per month, each costing Rs. 27. The cost per order is Rs. 150 and the inventory carrying charges work out to $20 \%$ of av. Inventory. Find the EOQ and the no. of order/year. Would you accept a $3 \%$ discount an a minimum quantity of 1200 units? Compare the total cost in both cases.
10. (a) Differentiatee between centralized and decentralized store. What are the principles of good location of store. 7
(b) Discuss in bricf :-
(i) Re order level.
(ii) Two bin system.
(iii) Lead time.
(iv) Safety stock.

