BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2008

BME-013 : PRODUCTION MANAGEMENT

Time : 3 hours   *Maximum Marks : 70*

Note :   *Attempt any five questions. All questions carry equal marks. Use of calculator is allowed.*

1. (a) Discuss with suitable examples, the process of launching a new product in the market. Explain with the help of suitable examples.

    (b) A manufacturing firm has three proposals for a product. Either it can be purchased from an outside vendor at Rs. 4·00 per unit or it can be manufactured in-plant. There are two alternatives for in-plant manufacturing. Either, a fully automatic unit is procured, involving fixed cost of Rs. 30,000 and variable cost of Rs. 2·75 per unit. Alternatively, a semi-automatic unit would cost Rs. 20,000 as fixed cost and Rs. 3·00 per unit variable cost. Draw a break-even chart for these alternatives. Suggest range of production volume suited for these alternatives.

    7+7

2. (a) What are the reasons for the successful application of robots in manufacturing system ?

(b) Product A consists of three B type sub-assemblies and one C type sub-assembly. The sub-assembly B consists of one D, one E sub-assembly, and one F. The sub-assembly C consists of a G and an F. The sub-assembly E consists of a D and a K.

   (i) Prepare a product tree.

   (ii) Prepare the Bill of Materials.

   (iii) Determine the number of each sub-assembly/components required to produce fifty units of item A.   7+7

3. (a) Describe the concept of the product life cycle. Give suitable examples.

(b) A toy manufacturer uses approximately 32,000 silicon chips annually. The chips are used at a steady rate during the 240 days a year that the plant operates. Annual holding cost is Rs. 0·60 per chip, and ordering cost is Rs. 24.

   Determine

   (i) The optimal order size

   (ii) The number of work days in an order cycle.   7+7

4. (a) What factors will you consider for locating any **one** of the following :

(i) a thermal power plant

(ii) a call centre

(iii) a placement agency

(iv) a milk processing plant

(b) There are seven jobs that must be processed in two operations : A and B. All seven jobs must go through A and B in that sequence — A first, then B. Determine the optimal order in which the jobs should be sequenced through the process using these times.

Job	Process A time	Process B time
1	9	6
2	8	5
3	7	7
4	6	3
5	1	2
6	2	6
7	4	7

7+7

5. (a) What are the advantages to retailers of sharing inventory ? For instance, suppose you go to a car dealer to find a blue model, and he doesn't have that model in stock. Typically, he will obtain the model from another local dealer. What are the disadvantages to the retailer ?

(b) Processing times (including set-up times) and due dates for five jobs waiting to be processed at a work centre are given in the following table. Determine the sequence of jobs, the average flow time, average job lateness and average number of jobs at the work centre, for each of these rules :

(i) Shortest processing time (SPT)

(ii) Earliest due date (EDD)

Job	Processing time (Days)	Due date (Days from now)
A	12	15
B	6	24
C	14	20
D	3	8
E	7	6

7+7

6. (a) Consider the supply chain for a domestic automobile :

(i) What are the components of the supply chain for the automobile ?

(ii) What are the different firms involved in the supply chain ?

(iii) What are the objectives of these firms ?

(b) The R & D department is planning to bid on a large project for the development of a new communication system for commercial planes. The accompaning table shows the activities, immediate predecessor and estimated duration :

Activity	Immediate Predecessors	Estimated Duration (months)
A	—	6
B	A	2
C	A	5
D	A	7
E	A	1
F	B	2
G	C, D, E	3
H	F	6
I	G	7
J	H	8
K	I, J	4

(i) Draw the network diagram.

(ii) Find the critical path.

(iii) Find the project completion time.

7+7

7. (a) Elaborate the need of strategic and controlling decision taken by managers. Explain with suitable examples.

(b) Assume that your stock of sales merchandise is maintained based on the forecast demand. If the distributor's sales personnel call on the first day of each month, compute your forecast sales by each of the three methods mentioned below.

	Actual
June	140
July	180
August	170

(i) Using a simple three-month moving average, what is the forecast for September ?

(ii) Using a weighted moving average, what is the forecast for September with weights of 0·20, 0·30 and 0·50 for June, July and August, respectively ?

(iii) Using single exponential smoothing and assuming that the forecast for June had been 130, forecast sales for September with a smoothing constant alpha (α) of 0·30.   7+7

8. Write short notes on any **four** of the following : $4 \times 3\frac{1}{2} = 14$

    (a)   The Kanban system

    (b)   Manufacturer's risk

    (c)   Balanced Scorecard

    (d)   Product Layout

    (e)   ABC Classification

    (f)   Cellular Manufacturing