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BME-013

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

00505

Term-End Examination

December, 2014

BME-013 : PRODUCTION MANAGEMENT

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***seven*** *questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) What are the different functional units in an organisation ? What is the role of production unit in the organisation ? *5*

(b) What factors would you consider while planning the layout of your facility ? How is the product-based layout different from a process-based layout ? *5*

2. (a) The fixed costs for a given period are ₹ 80,000. The estimated sales for the period are valued at ₹ 2,00,000. The variable cost per unit for the single product made is ₹ 4. If each unit sells at ₹ 20 and the number of units involved coincides with the expected volume of output, determine *5*

(i) the break-even point.

(ii) the profit earned at a turnover of ₹ 1,60,000.

(iii) the margin of safety.

(b) Distinguish between CPM and PERT. Describe how the expected activity times and variances can be computed in a PERT network. *5*

3. (a) The advertising budget and sales are given in the following table for a company :

Advertising budget (in ₹ 1,000)	Sales (in 100 units)
7	20
5	10
15	35
8	20
9	25
6	15

(i) Find a linear regression model for the sales forecast using the above data.

(ii) What is the sales forecast if the advertising budget is ₹ 12,000 ? *5*

(b) What are the aggregate production planning strategies ? Describe the importance of linear programming in aggregate production planning. 5

4. (a) Define principles of MRP. How can MRP reduce the inventory investment ? 5

(b) What do you understand by 'Enterprise Resource Planning' (ERP) system ? Describe the main module of an ERP system. 5

5. (a) Briefly explain the different long-term and short-term capacity planning strategies. 5

(b) A time study engineer has studied the time taken to machine crank shafts. He has taken 40 observations and these are summarized in the form of frequency distribution as shown below :

Time (Minutes)	Frequency
20	15
21	10
22	10
23	5

The performance rating of the operator machining the crank shaft is 110%. Find the standard time for machining the crank shaft by assuming allowance of 15%. 5

6. (a) Discuss the importance of inbound and outbound logistics in a supply chain with the help of suitable examples. 5

(b) Explain 'Synchronous Manufacturing'. How is 'Theory of Constraint' (TOC) related to it ? 5

7. (a) How do we distinguish between Supply Chain Management (SCM), purchasing and logistic management ? 5

(b) A particular item has a demand of 9,000 units per year. The cost of one procurement is ₹ 100 and the holding cost per unit is ₹ 2·40 per year. The replacement is instantaneous and no shortages are allowed. Determine 5

(i) the economic lot size.

(ii) the number of orders per year.

(iii) the total cost per year if the cost of one unit is ₹ 1.

8. (a) What is acceptance sampling ? Define the terms AQL, LTPD, consumer risk and producer risk in the context of acceptance sampling. 5

(b) There are seven jobs, each of which has to go through the machines A and B in the order AB. Processing time in hours are given as :

Job	: 1	2	3	4	5	6	7
Machine A:	3	12	15	6	10	11	9
Machine B:	8	10	10	6	12	1	3

Determine the sequence of these jobs that will minimize the total elapsed time T. Also find T and the idle time for machines A and B. *5*

9. (a) What is Kanban system ? How is the number of Kanban required calculated ? *5*

(b) Explain the term 'productivity'. Define various enlightened performance measures. *5*

10. Write short notes on any ***five*** of the following : *5×2=10*

(i) Bullwhip Effect

(ii) Work Sampling

(iii) Kaizen

(iv) Gantt Chart

(v) Pull System

(vi) Expediting

(vii) Business Process Re-engineering (BPR)

(viii) Capacity Constraint Resource (CCR)