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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?
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- (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?

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

(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.

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?

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

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

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(b) What do you understand by Enterprise Resource Planning' (ERP) system?

Describe the main module of an ERP system.

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

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(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%.

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

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(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

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- (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.

| | go throug order AB given as : | | | | hines | s A | and | Вi | |) |
|---|--|--|--|---|---|---|--|---|--|---|
| | 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 | |
| | will mini | miz | e th | e tot | al el | apse | d ti | me T | . Als | D |
| (a) | | | | | | | | | | e <i>5</i> |
| (b) | _ | | | | | | | | | |
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