# 2012

## M B A

## 2nd Semester Examination

## PRODUCTION AND OPERATIONS MANAGEMENT

**PAPER—205**

*Full Marks :* 100

*Time :* 3 Hours

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

*Write the answers to Questions of each Half in separate books.*

### *(First Half)*

(Marks : 50)

**1.** Answer any *four* of the following : 5×4

(a) Distinguish between MRP–I and MRP–II.

(b) Write a note on Master Production schedule.

(c) State the advantages of 'Aggregate Planning'.

(d) What do you mean by 'Social Cost benefit Analysis' of a project ?

(e) How is Break-Even-Analysis used in location Evaluation ?

(f) State the utility of Kiviat Diagram in production and operation management.

**2.** Answer any *two* of the following : 10×2

(a) (i) What are the principles followed in the process of choice of Plant location ?

(ii) Elaborate the steps and the criteria considered in the process of plant location. 3+7

(b) (i) What is process layout ? Why is process layout suitable for better utilisation of plant machinery and manpower ?

(ii) Table below gives the various factors considered for location decision and factor ratings assigned to sites A and B based on importance for location decision and location rating. Establish the product ratings and decide location alternatives based on merit of location of each of site A and site B.

| *Factor* | *Factor Rating* | *Location Ratings* | |
|---|---|---|---|
| | | *Location A* | *Location B* |
| 1. Tax Advantage | 4 | 8 | 6 |
| 2. Suitability of Labour skill | 3 | 2 | 3 |
| 3. Proximity of Customers | 3 | 6 | 5 |
| 4. Proximity of Suppliers | 5 | 2 | 4 |
| 5. Adequacy of water | 1 | 3 | 3 |
| 6. Quality of Education System | 3 | 2 | 5 |
| 7. Facility of Transport | 4 | 3 | 4 |
| 8. Availability of Electricity | 4 | 4 | 6 |

(c) (i) What is Assembly Line Balancing? Briefly state the salient features of Assembly Line Balancing.

(ii) The assembly line for a children's tricycle has the following work elements identified and the sequence indicated :

| *Work Element Nomenclature* | *Description of the Work Element* | *Immediate Predecessor of the Work Element* | *Work Element Time (minutes)* |
|---|---|---|---|
| A | Drill and make adequate provisions for the fixing of wheel on the handle bar | Nil | 4 |
| B | Drill and make adequate provisions for the fixing of wheels on the skeleton of the cycle | Nil | 4 |
| C | Fix seat support system and other skeleton of the cycle frame | B | 3 |
| D | Fix handle bar to the seat support system | A, C | 2 |
| E | Fix plastic seat | D | 2 |
| F | Fix plastic back rest | D | 3 |
| G | Mount the front wheel | E, F | 5 |
| H | Mount the rear wheels | E, F | 8 |

*Contd.*

| *Work Element Nomenclature* | *Description of the Work Element* | *Immediate Predecessor of the Work Element* | *Work Element Time (minutes)* |
|---|---|---|---|
| I | Install rubber mountings on the handle | G, H | 1 |
| J | Install bel on the handle | 1 | 1 |

From the above prepare the precedence diagram and find out the percentage in Balance Delay. 5+5

***[Internal Assessment : 10]***

***(Second Half)***

(Marks : 50)

**3.** Answer any *four* questions : 5×4

(a) Discuss the various ways in which the standard time established through time study may be used in industry. 5

(b) You have obtained the following information from a work sampling study carried out over 48 hours work per week :

Total units produced = 300

Average performance rating = 90%

Idle time = 18%

The allowance for this type of work is 20%.

Calculate the standard time per unit. 5

(c) State the benefits of Acceptance sampling. 5

(d) Xenith Ltd. is a producer of special purpose electric bulbs. Xenith's in-process inspection consist of checking a sample of 500 bulbs and noting any defectives. A bulb would be classified as defective based on one or more of the points in the checklist. The production process has an average fraction defective of 0.020. Design three sigma control limits for the process. 5

(e) Explain briefly the objectives of an effective maintenance programme. 5

(f) State the applications of time study. 5

**4.** Answer any *two* questions : 10×2

(a) Define Total Quality Management (TQM). 5+5

(b) ABC Ltd. has received an offer of quantity discounts on its order of material as under :

| *Price per tonne* (Rs.) | *Tonnes* |
|---|---|
| 1200 | Less than 500 tonnes |
| 1180 | 500 tonnes and less than 1000 tonnes |
| 1160 | 1000 tonnes and less than 2000 tonnes |
| 1140 | 2000 tonnes and les than 3000 tonnes |
| 1120 | 300 tonnes and above |

The actual requirement for the material is 5000 tonnes. The ordering cost per order is Rs. 1,200 and the stock holding cost is estimated at 20% of material cost p.a. you are required to compute the most economic purchase level.

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(c) Discuss the concept of EOQ. Explain the concept of productivity on total factor basis and partial factor basis.

5+5

***[Internal Assessment : 10]***

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