

25 (2) POMN 202 (N)

2011

PRODUCTION MANAGEMENT

Paper : 202

(New Syllabus)

Full Marks : 70

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer any **five** questions

1. (a) Identify the purpose and products of an university and describe the inputs, transformation process and outputs of the same. 4
- (b) (i) Evaluate and explain the following hospital productivity measure :
- | | | |
|--|--------------------------------|--|
| | <u>Beds filled</u> | |
| | Salaries of hospital personnel | |
- (ii) Devise a better productivity measure. 3+3=6
- (c) Give a brief review of Shigeo Shingo's Seven Wastes. 4

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(Turn Over)

2. (a) Explain how FMS differs from a jobshop and from an assembly line system. 5
- (b) Tasks, task times and required predecessors are given in the table for a food processing plant. Assume tasks cannot be split :

| Task | Task time (in mins) | Required predecessor |
|------|---------------------|----------------------|
| A | 3 | None |
| B | 6 | A |
| C | 7 | A |
| D | 5 | A |
| E | 2 | A |
| F | 4 | C, B |
| G | 5 | C |
| H | 5 | D, E, F, G |

- (i) What is the theoretical minimum cycle time?
- (ii) Balance the line using LOT rule.
- (iii) Calculate the efficiency of the balanced line. $2+5+2=9$
3. (a) Outline the factors that should be considered in locating a call centre. List these factors in order of priority with brief explanation. 7
- (b) Explain aggregate planning and its characteristics. 7

4. (a) Develop an operations strategy model of a business and describe the four key objectives of operations. 6

(b) Part number X1 has an annual independent demand as spare parts of 4000 units, a set-up cost of Rs 100, a carrying cost of 30 percent per year and an item cost of Rs 266.67. The production facility is open 5 days a week and 50 weeks per year. The lead time for this product is 9 days and the standard deviation of demand is 2 units per day. The company wants to have a 95 percent service level for this spare part.

- (i) Compute EOQ.
- (ii) Compute reorder point, R.
- (iii) Interpret the results of your computations. $3+3+2=8$

5. (a) Distinguish between product layout and process layout. What disadvantages would occur if product layout was used in a situation where process layout was the appropriate choice? $4+3=7$

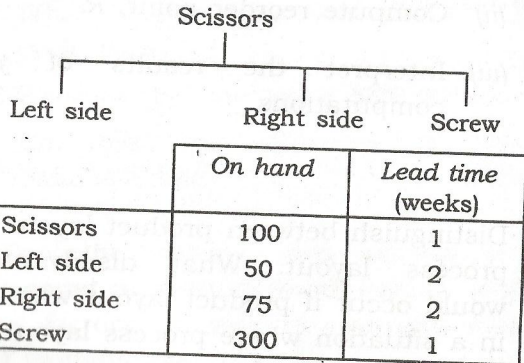
(b) Consider the following jobs and their processing times (hours) at corresponding machines :

| | | | | |
|-----|---|-------|-------|-------|
| | | M_1 | M_2 | M_3 |
| Job | A | 13 | 5 | 9 |
| | B | 5 | 3 | 7 |
| | C | 6 | 4 | 5 |
| | D | 7 | 2 | 6 |

Using Johnson's rule, find optimal sequence, idle time and total elapsed time. $2+5=7$

6. (a) Outline the purpose of MRP and explain how an MRP system can achieve these purposes.

(b) The BOM for a basic scissors consisting three parts is given below :



Assuming the master schedule calls for 300 scissors to be shipped in week 4 and 400 in week 5, work out a complete materials plan.

7. (a) Give a basic classification of quality control technique with brief notes on each.

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(b) A process for producing electronic circuits has achieved very high yield levels. An average of only 10 defective parts per million is currently produced.

(i) What are the upper and lower control limits for a sample size of 100?

(ii) Recompute the upper and lower control limits for a sample size of 1000.

(iii) Which of these two sample sizes would you recommend? Explain.

$3+3+2=8$
