



CBCS SCHEME

17MA751

Seventh Semester B.E. Degree Examination, July/August 2021

Operations Management

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Define operations management. Explain in brief the functions of operations management. (10 Marks)
- b. Define productivity. Explain the factors affecting productivity. (10 Marks)
- 2 a. What is Decision Making? What are the step involved in decision making? (06 Marks)
- b. Briefly explain the characteristics of operations decision and the frame work for decisions. (08 Marks)
- c. What is Break Even Analysis? Explain. (06 Marks)
- 3 a. Define capacity planning. Explain long term and short term capacity strategies. (06 Marks)
- b. What are the factors influencing plant location? Explain. (06 Marks)
- c. Explain manufacturing and service systems in operation management. (08 Marks)
- 4 a. What is forecasting? Explain the factors affecting forecasting. (10 Marks)
- b. A Firm believes that its annual profit depends on its expenditures for research. The information for the preceding six years is given below. Estimate the profit when the expenditure is 6 units.

| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------------------------------|----|----|----|----|----|----|---|
| Expenditure for research (X) | 2 | 3 | 5 | 4 | 11 | 5 | 6 |
| Amount profit (Y) | 20 | 25 | 34 | 30 | 40 | 31 | ? |

(10 Marks)

- 5 a. What is aggregate planning? Explain pure and mixed strategies employed by production planner to meet non uniform demands? (10 Marks)
- b. A company produces mini-computers that have a seasonal demand pattern. The available production capacities during regular time and over time, as well as other cost data are as follows :

| Period | Regular time | Over time | Sub contract |
|--------|--------------|-----------|--------------|
| 1 | 900 | 350 | 600 |
| 2 | 1000 | 350 | 600 |
| 3 | 1100 | 350 | 600 |
| 4 | 700 | 350 | 600 |

Demand forecast

| Period | 1 | 2 | 3 | 4 |
|----------------|-----|------|------|------|
| Unit of demand | 700 | 1000 | 2000 | 1200 |

Available initial inventory = 200 units Desired final inventory = 150 units
 Regular time cost/unit = Rs. 125 Over time cost/unit = Rs. 150
 Subcontracting cost/unit = Rs. 175 Inventory cost/unit/period = Rs. 25

Formulate this problem as a transportation problem to determine optimum production levels and means of production for the next four quarter period. Also solve the model. (10 Marks)

- 6 a. Explain with neat block diagram the relationship of master production schedule to other manufacturing planning and control activities. (10 Marks)
 b. Explain master scheduling methods. (05 Marks)
 c. Explain master scheduling objectives. (05 Marks)
- 7 a. Define MRP and with a block diagram, explain the various inputs to an MRP system. (10 Marks)
 b. Explain the key features required for handling MRP system refinement. (10 Marks)
- 8 a. What is capacity requirement planning? Briefly explain the different steps involved in capacity management. (10 Marks)
 b. Write a short note on :
 i) Capacity management
 ii) CRP activities. (10 Marks)
- 9 a. Explain the concept of single machine scheduling. (05 Marks)
 b. A single machine scheduling problem is given below :

| | | | | | |
|---------------------------|----|---|---|----|---|
| Job(j) | 1 | 2 | 3 | 4 | 5 |
| Processing time (t) hours | 15 | 4 | 5 | 14 | 8 |

- Find the optimal sequence, which will minimize the mean flow time and also obtain the minimum flow time. (05 Marks)
- c. With a neat sketch and example, explain Gantt charts used in scheduling process. List the merits and demerits. (10 Marks)
- 10 a. Find the sequence for the following jobs that minimizes the total elapsed time for completing all jobs. Each job is processed in the order CAB. Find the total elapsed time, idle time for each machine and waiting time for the Job A.

| Machine \ Jobs | Processing time (hrs) | | | | |
|----------------|-----------------------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| A | 2 | 1 | 4 | 5 | 3 |
| B | 3 | 5 | 7 | 6 | 7 |
| C | 5 | 7 | 6 | 9 | 5 |

- (10 Marks)
- b. Use graphical method to minimize the time needed to process the following jobs on the machines shown below. For each machine find the job which should be scheduled first and also calculate the total elapsed time to complete both the jobs.

| | | | | | | |
|---------|---------------|---|---|---|---|---|
| Job - 1 | Sequencing | A | B | C | D | E |
| | Time (in hrs) | 2 | 3 | 4 | 6 | 2 |
| Job - 2 | Sequencing | C | A | D | E | B |
| | Time (in hrs) | 4 | 5 | 3 | 2 | 6 |

(10 Marks)
