

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

20MCM15

First Semester M.Tech. Degree Examination, July/August 2022 Operations Management

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Differentiate clearly between classical, Behavioural and Quantitative management. (10 Marks)
- b. Discuss the tasks of a production manager with a suitable example. (10 Marks)

OR

- 2 a. Describe production system with a suitable example. (10 Marks)
- b. Discuss the models adopted by managers in decision making. (10 Marks)

Module-2

- 3 a. Express the following linear programming problem in standard form:
 Maximize $Z = 3x_1 + 4x_2 + 2x_3$
 Subject to : $x_1 + x_2 + x_3 \geq 45$
 $2x_1 + x_2 + 3x_3 \leq 65$
 $3x_1 + 4x_2 + 5x_3 \geq 100$
 where $x_1, x_2, x_3 \geq 0$. (06 Marks)
- b. Solve the following LPP by Tabular method:
 Maximize $Z = 3x_1 - x_2 + 4x_3 + 2x_4$
 Subject to: $2x_1 - x_2 + x_3 + x_4 \leq 5$
 $2x_1 + x_2 + 3x_3 + 2x_4 \leq 35$
 $3x_1 + x_2 + 2x_3 + 4x_4 \leq 30$
 where $x_1, x_2, x_3, x_4 \geq 0$ (14 Marks)

OR

- 4 a. Briefly explain the role of slack variables and artificial variables in LP models. (06 Marks)
- b. Obtain the solution for the following LPP by tabular method:
 Maximize $Z = 6x_1 - 3x_2 + 2x_3$
 Subject to: $2x_1 + x_2 + x_3 \leq 16$
 $3x_1 + 2x_2 + x_3 \leq 18$
 $x_2 - 2x_3 \geq 8$
 where $x_1, x_2, x_3 \geq 0$. (14 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Using simple exponential smoothing technique, determine the forecast for the period 1 through period 12 with smoothing constants $\alpha = 0.1$ and $\alpha = 0.3$. Assume first period forecast is equal to demand in that period.

Period	Demand
1	121
2	125
3	124
4	118
5	134
6	127
7	124
8	141
9	133
10	135
11	141
12	139

(10 Marks)

- b. The demand for a product during last 10 years is given below. Estimate the demand for next 10 years by the method of regression. Also find the estimated demand in 11th year and 12th year.

Year	1	2	3	4	5	6	7	8	9	10
Units	124	135	145	150	167	157	161	170	187	168

(10 Marks)

OR

- 6 a. Describe process layout and product layout with suitable diagrams. (12 Marks)
 b. Explain briefly:
 i) Aggregate planning
 ii) Line balancing. (08 Marks)

Module-4

- 7 a. Explain the parameters of an inventory policy. (08 Marks)
 b. Discuss the costs associated with inventory policy. (12 Marks)

OR

- 8 a. Derive an expression for determining EOQ that minimizes total annual inventory costs. (14 Marks)
 b. A company needs 6000 units of a product per month. The product is purchased from outside for which set up cost is Rs.2000 per order. The cost of holding inventory, in terms of capital tied up amounts to Rs.1.50 per unit per month. How frequently should the company place orders for the product? (06 Marks)

Module-5

- 9 a. Describe master production system with a block diagram. (10 Marks)
 b. Discuss the following:
 i) ERP system
 ii) Quality circle. (10 Marks)

OR

- 10 a. Describe Kanban system used in Industries. (10 Marks)
b. Five jobs are to be processed on 3 machines A, B and C on a shop floor. Determine the sequence that minimizes total time for performing the following job in order ACB. Determine the total elapsed time for optimum sequence.

Time in Minutes

Machines	1	2	3	4	5	6	7
A	12	6	5	11	5	7	6
B	7	8	9	4	7	8	3
C	2	1	1	1	3	4	2

(10 Marks)

* * * * *