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J-21-0064

B. Tech. EXAMINATION, 2021

Semester VI (CBCS)

OPERATION RESEARCH

ME-604

Time : 2 *Hours* *Maximum Marks :* 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. Define operational research and explain the significance of operational research in modern management scenario. **15**

2. Explain the classifications of OR models. Is it important to test the models ? If yes, explain the significance. **15**

Section B

3. Explain the formulation for linear programming problem. Explain it in detail. **15**

4. An auto manufacturer is engaged in three different car manufacturing. These cars are manufactured at a company having two different units of capacities. In a normal 8 hours/day Plant (1) produces 100, 200, 200 cars of A, B and C types. Whereas, Plant (2) manufactures 120, 120 and 400 cars of A, B and C respectively. Whereas, the monthly demand of cars is 5,000, 6,000 and 14,000 respectively of A, B and C. Where the operation cost of plant (1) and Plant (2) is Rs. 5,000 and 7,000. So, formulate the problem. **15**

Section C

5. State the difference between the assignment model and transportation model. **15**

6. Explain the concept of queuing theory. Illustrate the queuing situations and their solutions. **15**

Section D

7. What do you understand by CPM ? Explain the steps in CPM required for project planning. **15**

8. What do you understand by Fulkerson's rules in PERT networks ? **15**

(Compulsory Question)

9. Give the answer of the following questions :

(a) What is duality in simplex method ? Also explain the stepping stone method. **4**

(b) How the optimal solution is different from a basic feasible solution ? **4**

(c) Explain the Gantt chart. Also illustrate basic assumptions in linear programming. **4**

(d) Explain the slack along with its significance. Also list the steps of scientific decision-making. **3**