



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

B.Tech VI Semester End Examinations (Regular), November– 2020

Regulation: IARE–R16

OPERATIONS RESEARCH

(ME)

Time: 2 Hours

Max Marks: 70

Answer any Four Questions from Part A

Answer any Five Questions from Part B

PART – A

1. What are the main characteristics of operations research in industry? [5M]
2. Give an algorithm to solve an assignment problem. [5M]
3. Justify Johnson's rule for sequencing n jobs x 2 machines [5M]
4. What are the advantages and disadvantages of increasing inventory? [5M]
5. Explain in brief the main characteristics of the queuing system. [5M]
6. Explain the applications of simulation technique to the inventory problems. [5M]
7. State general representation of sequencing? [5M]
8. Why does Vogel's approximation method provide a good initial feasible solution? [5M]

PART – B

9. Solve the following LP problem graphically: $Max Z = 8000x + 7000y$
Subject to $3x + y \leq 66$, $x + y \leq 45$, $x \leq 20$, $y \leq 40$ and $x, y \geq 0$ [10M]
10. Discuss the various phases in solving operations research problems. [10M]
11. List the steps involved in solving travelling salesman problem. Explain. [10M]
12. Describe the line drawing procedure that has to be adapted while solving assignment problem. [10M]
13. Briefly explain about the replacement policy of items which deteriorate with time. [10M]
14. A Manufacturer is offered two machines A and B. Machine A is priced at Rs. 5000 and running cost is estimated at Rs. 800 for each of the first five years, increasing by Rs. 200 per year in the sixth and subsequent years. Machine B, with the same capacity as A, costs Rs. 2500, but has running cost of Rs. 1200 per year for six years, thereafter increasing by Rs. 200 per year. If money is worth 10% per year, which machine should be purchased? (Assume that the machines will eventually be sold for scrap at a negligible price). [10M]
15. What do you understand by zero - sum and non zero – sum game? What do you mean by strategy, dominance and saddle point? [10M]
16. An auto parts supplier sells Hardy-brand batteries to car dealers and auto mechanics. The annual demand is approximately 1,200 batteries. The supplier pays \$28 for each battery and estimates that the annual holding cost is 30 percent of the battery's value. It costs approximately \$20 to place an order (managerial and clerical costs). The supplier currently orders 100 batteries per month. i) Determine the ordering, holding, and total inventory costs for the current order quantity ii) Determine the economic order quantity [10M]
17. Define simulation why simulation uses. Give one application area when this technique is used in practice. [10M]
18. Elucidate what factors must be considered when designing simulation experiment. [10M]