



Paper ID : 260683

Printed Page: 1

Subject Code:BOE087

Roll No:

BTECH

(SEM. VIII) THEORY EXAMINATION 2025-26

INDUSTRIAL OPTIMIZATION TECHNIQUES

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.**02 x 7 = 14**

Q no.	Question	CO	Level
a.	Explain the role of optimization in engineering design problems.	CO1	K2
b.	Define basic feasible solution in Linear Programming.	CO1	K1
c.	What is degeneracy in transportation problems?	CO1	K2
d.	State assumptions of sequencing problems.	CO2	K1
e.	Define critical path and float in network analysis.	CO2	K2
f.	What is dominance principle in game theory?	CO3	K1
g.	Define inventory carrying cost and shortage cost.	CO5	K2

SECTION B

2. Attempt any three of the following:**07 x 3 = 21**

Q no.	Question	CO	Level
a.	Formulate a real-life engineering problem as a Linear Programming Problem and solve it using the graphical method. Interpret the feasible region and optimal solution.	CO1	K4
b.	Explain the Simplex method in detail. Solve a maximization problem step-by-step.	CO1	K4
c.	Solve a transportation problem using an appropriate initial solution method and test optimality using MODI method. Explain each step clearly.	CO1	K5
d.	Solve an assignment problem using Hungarian method and discuss its variations including TSP.	CO1	K5
e.	Explain the concept of Dynamic Programming. Formulate and solve a capital budgeting problem using dynamic programming approach.	CO4	K4

SECTION C

3. Attempt any one part of the following:**07 x 1 = 07**

Q no.	Question	CO	Level
a.	Solve a Linear Programming Problem using Dual Simplex Method. Explain each iteration and interpret the final solution in engineering context.	CO1	K5
b.	Explain Travelling Salesman Problem in detail. Solve a suitable numerical problem using assignment approach.	CO1	K4



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4. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Explain Johnson's rule for sequencing. Solve a problem involving n jobs through 2 machines and compute total elapsed time and idle time.	CO2	K4
b.	Construct a network diagram for a project and perform forward and backward pass computations. Identify critical path and floats	CO2	K5

5. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Perform CPM analysis for a given project. Determine earliest and latest times, floats, and identify the critical path.	CO2	K5
b.	Explain PERT technique in detail. Solve a project scheduling problem by calculating expected time, variance, and probability of completion.	CO2	K4

6. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Explain maxi-min and mini-max principles in game theory. Solve a two-person zero-sum game and interpret the optimal strategies.	CO3	K4
b.	Analyze an M/M/1 queuing model. Derive formulas and compute system performance measures such as waiting time, queue length, and utilization	CO3	K5

7. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Solve a dynamic programming problem using forward recursion. Explain each stage and decision process clearly.	CO4	K5
b.	Develop an EOQ inventory model and explain replacement policies for deteriorating items and sudden failures with examples.	CO5	K5