Roll No: | | | | | | | | | | | | |

BTECH
(SEM VIII) THEORY EXAMINATION 2024-25
INDUSTRIAL OPTIMIZATION TECHNIQUES

TIME: 3 HRS   **M.MARKS: 100**

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

SECTION A

1.   **Attempt *all* questions in brief.**   **2 x 10 = 20**

Q No.	Question
a.	Why is optimization required?
b.	What do you mean by mathematical formulation of a problem?
c.	Explain CPM.
d.	Define dynamic programming.
e.	Define queueing modal.
f.	What do you mean by simulation? Explain.
g.	Explain the term network logic.
h.	Discuss dynamic programming with example.
i.	What do you mean by replacement model in industrial optimization?
j.	What do you mean by the term set-up cost and holding cost as applied to an inventory model?

SECTION B

2.   **Attempt any *three* of the following:**   **10 x 3 = 30**

Q No.	Question
a.	Discuss the following methods and their application in engineering with suitable example: (i) Simplex method. (ii) Duplex Method.
b.	Discuss in detail the mathematical formulation and the optimal solution of the transportation modal.
c.	What do you understand by the forward and backward computation in PERT? Elaborate it using a proper example.
d.	Discuss Monte Carlo simulation and its application in engineering.
e.	Write a note on the individual and group replacement policies and their application to engineering.

SECTION C

3.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

Q No.	Question
a.	What do you understand by the formulation of design problems as a mathematical programming problem? Elaborate with suitable example.
b.	Write a note on the historical development of optimization.

4.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

Q No.	Question
a.	Define sequencing. What is the relevance in engineering? Discuss the concept of 2 jobs through m machines sequencing.
b.	What is travelling salesman problem? Explain. Also discuss its application in engineering with a proper example.

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5.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

Q No.	Question
a.	What is Principle of dominance? Discuss in detail with suitable example.
b.	Discuss the single server model and explain its application to engineering with an example.

6.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

Q No.	Question
a.	Write note on the following: (i) Capital budgeting problem, (ii) Cargo-loading problem.
b.	Describe the various types of simulation with suitable examples.

7.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

Q No.	Question
a.	Discuss the deterministic and probabilistic inventory models and their applications in engineering with suitable examples.
b.	Write a note on the equipment renewal problem.