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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

M.Tech-II Semester (Construction Management)

COURSE CODE (CREDITS): 10M11CE213 (3)

MAX MARKS: 35

COURSE NAME: CONSTRUCTION COST ANALYSIS

COURSE INSTRUCTOR: Dr. KAUSHAL KUMAR

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is allowed.

Q.No	Question	Marks
Q1	(a). Explain the principles of Cost-Benefit Analysis for construction projects. Discuss the importance of Benefit-Cost Ratio (BCR), Net Present Value (NPV), and Internal Rate of Return (IRR) in project evaluation. (b). A bridge construction project requires an initial investment of ₹80 crore. The annual economic benefit generated is ₹14 crore, while annual operation and maintenance cost is ₹3 crore for 12 years. Assuming a discount rate of 10%, determine the Net Present Value (NPV) and Benefit-Cost Ratio (BCR). Comment on the economic feasibility of the project.	2 + 5
Q2	Two pavement construction alternatives are available: Alternative A has an initial cost of ₹30 crore with annual maintenance of ₹2 crore, while Alternative B has an initial cost of ₹42 crore with annual maintenance of ₹0.8 crore. For a project life of 20 years and interest rate of 8%, determine the preferable alternative using Incremental Cost Analysis.	5
Q3	Explain Economic Feasibility Analysis in construction projects. Discuss the role of Sensitivity Analysis and Risk Consideration in construction investment decision-making.	3
Q4	Compare the following conceptual cost estimating methods used during the preliminary stage of construction projects: Plinth Area Method, Cubic Content Method, Functional Unit Method, and Cost-Capacity Factor Method. State the advantages and limitations of each method.	4

Q5	A water treatment plant of capacity 40 MLD was completed at a cost of ₹120 crore. Estimate the approximate cost of a proposed plant of capacity 65 MLD using the Cost-Capacity Factor Method, assuming a scaling exponent of 0.72 and cost index escalation of 15%.	5
Q6	(a). Define Life-Cycle Cost Analysis (LCCA). Explain its significance in evaluating alternative materials and systems in construction projects, considering initial cost, operation cost, maintenance cost, and replacement cost. (b). Two roofing systems are proposed for a building project. System A has an initial cost of ₹18 lakh, annual maintenance cost of ₹40,000, and service life of 20 years. System B has an initial cost of ₹24 lakh, annual maintenance cost of ₹15,000, and service life of 25 years. At an interest rate of 7%, determine the more economical alternative using Life-Cycle Cost Analysis.	3 + 3
Q7	Discuss, with suitable examples, how Integrated Cost Analysis combining engineering economics, cost-benefit analysis, economic feasibility, conceptual estimating, and life-cycle costing helps in making better construction project investment decisions.	5