JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS- 2026

M.Tech-II Semester (CE-Construction Management)

COURSE CODE (CREDITS): 10M11CE213 (3) MAX MARKS: 25

COURSE NAME: CONSTRUCTION COST ANALYSIS

COURSE INSTRUCTOR: Dr. KAUSHAL KUMAR MAX. TIME: 1 Hour 30 Min

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.*

<table>
<tr><th>Q.No</th><th>Question</th><th>Marks</th></tr>
<tr><td>Q1</td><td>A road project requires an initial investment of ₹50 lakh. The expected annual benefits are ₹12 lakh for 8 years. The annual maintenance cost is ₹3 lakh. Assuming a discount rate of 10%:
(a) Calculate the Net Present Value (NPV)
(b) Calculate the Benefit–Cost Ratio (BCR)
(c) Comment on the economic feasibility of the project</td><td>4</td></tr>
<tr><td>Q2</td><td>A construction project requires an initial investment of ₹40 lakh and generates the following cash inflows:
<table><tr><th>Year</th><th>Cash Inflow (₹ lakh)</th></tr><tr><td>1</td><td>8</td></tr><tr><td>2</td><td>10</td></tr><tr><td>3</td><td>12</td></tr><tr><td>4</td><td>14</td></tr><tr><td>5</td><td>16</td></tr></table>(a) Determine the Payback Period
(b) Estimate the Internal Rate of Return (IRR) (trial method)
(c) Decide whether the project is acceptable if MARR = 12%</td><td>4</td></tr>
<tr><td>Q3</td><td>Two mutually exclusive bridge projects have the following data:
<table><tr><th>Project</th><th>Initial Cost (₹ lakh)</th><th>Annual Benefit (₹ lakh)</th><th>Life (years)</th></tr><tr><td>A</td><td>60</td><td>15</td><td>10</td></tr><tr><td>B</td><td>90</td><td>22</td><td>10</td></tr></table>At a discount rate of 10%:
(a) Perform incremental benefit–cost analysis
(b) Determine which project should be selected
(c) Justify your answer</td><td>5</td></tr>
</table>

Q4	A project has: Initial cost = ₹80 lakh Annual revenue = ₹20 lakh Annual operating cost = ₹6 lakh Life = 10 years Discount rate = 10% (a) Calculate **NPV** (b) Perform **sensitivity analysis** if: • Revenue decreases by 15% • Cost increases by 10% (c) Comment on project risk	4
Q5	Explain the concept of economic feasibility analysis for construction projects. Discuss the limitations of cost–benefit analysis, particularly in handling intangible benefits and uncertainties.	4
Q6	A government agency has a limited budget and multiple infrastructure projects to choose from. a) Explain the methods of decision-making under limited budgets (capital rationing) b) Discuss how BCR and NPV can be used for project selection	4