

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 END SEMESTER EXAMINATION-2015
 M.TECH, SEMESTER - II

COURSE CODE: 10M11CE213
 COURSE NAME: CONSTRUCTION COST ANALYSIS
 COURSE CREDITS: 03

MAX. MARKS: 45

MAX. TIME: 3 HRS

Note: All questions are compulsory. Draw figures and sketches to illustrate your answers. Assume missing data suitably if required. Carrying of mobile phone during examinations will be treated as case of unfair means.

Section A

1. Define a project and an operation with suitable example. 1
2. What is the importance of Life Cycle Cost? 1
3. What is the importance of earned value management technique? 1
4. Write short notes on - Accepted Cost Estimate 1 x 6 = 6
 - Job Cost Report
 - B/C ratio
 - Cost Performance Index
 - Schedule Performance Index
 - Estimate to complete

Section B

1. A 100 hp air compressor costs Rs.1,50,000 five years ago when the cost index was 130. Estimate the cost of a 300 hp air compressor today when the cost index is 255. The exponent is 0.8. 3
2. A civil contract has been awarded consisting of the following two work items. What is the status at the end of the week 30? Calculate CPI, SPI, ETC, EAC and weeks required to complete the work. 5

Available information is given below.

Work Item	Start week	Completion week	Estimated Qty. (m ³)	Budget at Completion (Rs.)	Work completed to date (m ³)	Actual Cost (Rs.)
Earthwork	0	30	89,600	90,00,000	80,000	96,00,000
Concrete	2	32	9,000	7,20,00,000	8,100	6,24,00,000

3. Estimate the item rate for mechanical excavation in normal soil. Available information is given below. 5

Total scope 20000 m³, duration 2 months, consider lead as 4 km.

Equipment	Hire charges (Rs./month)	Fuel consumption (lit/hr)
CK 90 excavator	1,00,000	12
Dumpers	40,000	4

Consider 26x10 hrs working in a month. Assume any other data suitably if required.

4. Cumulative values (client bill amounts) at the end of months of a construction project are given below. 5

Month	J	F	M	A	M	J	J	A	S	O	N	D
Value (Client bill amount) in each month	1	1.5	2.5	2.5	2.5	2.5	2.5	5	5	1.5	0.5	0.5
Cumulative value	1	2.5	5	7.5	10	12.5	15	20	25	26.5	27	27.5

Draw project cash flow diagram with following contract conditions and assumptions.

Total Cost = 92% of the value (client bill amount),

Departmental labor cost = 20% of the total cost, and no delay in labor payment,

Material cost = 30% of the total cost, but one month delay in payment to the supplier,

P&M cost = 20% of the total cost, but one month delay in payment to the vendor,

Subcontractors cost = 20% of the total cost, but there is one month delay in payment to the subcontractor,

Overhead cost = 10% of the total cost, and no delay in payment,

Retention (deduction in each month client bill) = 10% of billed amount in every bill, 50% of total retention money payable after one month of completion and other 50% after six month of completion.

There is one month delay between raising the client bill and receiving the cash by the contractor.

5. Government is planning for a hydroelectric project which will also provide flood control, irrigation & recreation benefits. The established benefits & cost of three alternatives are given in the following table. The interest rate to be used for the analysis is 10 % and life of each of the alternatives A, B and C is to be assumed as 60 years. Justify the investment by using Benefit Cost ratio and choose the best alternatives. 5

Alternatives	A	B	C
Initial cost	300	500	400
Annual power sale	10	18	12
Annual flood control	2.5	5	3.5
Annual irrigation benefit	3.5	6	4.5
Annual recreation benefit	1	3.5	2
Annual operation & maintenance cost	2	3.5	2.5

Section C

- Describe elaborately different steps involved for detailed construction cost estimation. 4.5
- Describe different stages of a construction project. 4
- Suppose you are a planning in-charge in a construction project and asked to prepare Job Cost Report. What will be the various steps to prepare and draw a proper format of the report? 4.5