

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
SECOND SEMESTER 2022 - 2023
CONSTRUCTION PLANNING & TECHNOLOGY

Course No: CE F242
Duration: 180 Mins (Closed book)

Date: 15-05-2023 [9:30 AM start]
Max. Marks: 80

Q1: Fill up the blanks: [15 x 1 = 15 marks]

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| <p>1) EPC stands for _____</p> <p>2) AEC stands for _____</p> <p>3) Payment bond and performance bond are one and the same (True/False)</p> <p>4) Bid Price Factor is defined as _____</p> <p>5) There is no difference between market value and fair market value (True/False)</p> <p>6) Notice to proceed means _____</p> <p>7) NIT stands for _____</p> <p>8) RA bill stands for _____</p> <p>9) Earnest Money is taken at the time of bid/tender submission from all bidders (True/False)</p> | <p>10) Tenders for combined Civil, horticulture, internal Electric Installations and other internal & external electrical works are called _____</p> <p>11) A company offered a reward in the newspaper to anyone who could return a missing title deed of a land. A person without the knowledge of such reward returned the deed. In this case, the person is _____ (required/not required) to be rewarded.</p> <p>12) Valuers approved by certain banks are called _____</p> <p>13) A use that was once legal but no longer conforms to the zoning in which it is located is called _____</p> <p>14) Landlocked land is _____</p> <p>15) Worth of a lessor's right to possess leased property at the termination of lease is called _____</p> |
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Q2. Short answers: [5 x 3 = 15 marks]

- a. The concrete placing team has been assigned the task of laying ready-mix concrete for the foundation of the multistoried building. The foundation essentially consists of four isolated footing of 50 cubic meters each. The standard and actual cost data for concreting the four isolated footings are as follows.

Cost category	Standard cost (in Rs.)	Actual cost (in Rs.)
Direct materials	10,00,000	Data to be computed
Direct labor	50,000	80,000
Direct equipment	20,000	25,000

- It so happens that the actual concrete used is 190 cubic meters instead of estimated (standard) 200 m³ and escalated to 5000 per m³ (at the time of placing). Determine the direct cost variance, direct materials cost variance.
- b. Explain the importance of mobilization clause and escalation clause with respect to construction contract.
- c. What are the different methods of resolving a dispute?
- d. What is valuation? What are the factors affecting the valuation of property with suitable examples?
- e. What are the common unsafe environments prevailing in the construction industry?

Q3. Mention 10 different things that you know about NBC 2016. Depending upon the quality of points, marks will be awarded [**10 mark**]

Q4 (a). The following is cost data with respect to a typical multi-storied residential project with estimated critical path duration as 50 weeks.

Data type	Item	Amount
Cost data	Weekly fixed overhead cost	Rs. 2,00,000/week
	Variable overhead percentage	15%
	Mobilization cost percentage	5%
	Markup percentage	6%
	Bond Premium	1%
Contract terms	Advance payment percentage of contract bid price	0%
	Retained percentage of pay requests	10%
	Number of months between submitting pay requests	1 month
	Lag in paying payment requests	1 month
	Lag to make final payment and return the retained money	0 month

The total direct cost of all the activities is estimated to be Rs. 1, 70, 00,000/- Determine contract price and bid price factor. [**7 mark**]

(b) Briefly explain different types (any three) of contracts. [**3 marks**]

Q5. For the following data of a project, prepare the following.

- Cash inflow calculations for the contractor [7 marks]
- Cash outflow calculations for the contractor [8 marks]

The value of the contract is Rs. 101,50,000. The duration of the project is four months. The owner makes an advance payment of Rs. 10 Lakhs, which is to be recovered in four equal instalments. The owner also supplies materials worth Rs. 5 Lakhs, which is to be recovered equally from each running account bill.

The owner will recover from the payments made to the contractor 2% of the value of the work done as income tax deducted at source and deposit this amount with the Reserve Bank of India (RBI).

Item description	Unit	Total quantity	Rate (Rs.)	Amount (Rs.)	Quantities to be executed in			
					Month 1	Month 2	Month 3	Month 4
Earthwork Excv.	Cubic metre	1000	100	1,00,000	1000			
RCC	Cubic metre	1000	5,000	10,00,000	500	500	500	500
Brick Work	Cubic metre	3000	1,500	45,00,000	500	1500	500	500
Sanitary Works	L.S	---	-----	30,00,000			50%	50%
Electrical Works	L.S	---	-----	Need to calculate			50%	50%
Wood Work	L.S	-----	-----	3,50,000			50%	50%
Finishing Work	Square m.	5000	200	10,00,000				5000

Note: The contractor has prepared the construction schedule and has been approved by the owner.

Additional conditions and assumptions:

- The cost of a particular item is 90% of the quoted rates.
- The total cost for a particular item consists of labour (20%), material (60%), plant and machinery (10%) and sub-contractor cost (10%).
- Assume that there is no delay in the payment to labour, but a delay of two month occurs in paying the sub-contractors, material suppliers.
- Retention of 10% of the billed amount in every bill. The fifty per cent retention amount is payable after one month of practical completion while the remaining 50% is payable six months later.

Q6. Figure shows the plan of a residential building. Estimate the quantities of the following using either:

- Earthwork in excavation in foundation and concrete in foundation using centerline method. [7 marks]
- Brickwork in superstructure using long wall-short wall method. No need to consider brickwork in parapet. [8 marks]

