BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
FIRST SEMESTER 2022 - 2023
CONSTRUCTION MANAGEMENT - Comprehensive Exam - Regular

Course No: CE G527   **Date: 26-12-2022 [2:00 PM start]**
Duration: 90 Mins (Closed book)   **Max. Marks: 30**

Note: There is no strict time limit between closed book and open book. You may decide accordingly depending on the level of questions.

I: Choose the best answers   **[15 x 1 = 15 marks]**

1) RERA stands for _____

2) PERT represents event oriented network (True/False)

3) Direct cost is the cost associated with project as a whole (True/False)

4) Express terms are terms that have been specifically mentioned and agreed by both parties at the time the contract is made. They can either be oral or in writing (True/False)

5) The absence of the linkage between _____ and _____ affects the cash flow and creates non-executable schedules that lead contractors to a high rate of failure.

6) BIM stands for _____

7) The arbitrator has the right to award all or part of the costs of the case against one or both of the parties (True/False)

8) It is compulsory for all the bidders to attend the pre-bid conference (True/False)

9) Though OPC is permissible as per companies act 2013, a person cannot form more than _____ OPCs.

10) "Fire protection and fighting systems" is listed under the building works category _____ (Structural works, civil works, engineering services)

II: Short answers   **[10 x 2 = 30]**

1) What is the difference between resource smoothing and resource levelling?

2) What is the common assumption made in Line of Balance?

3) Define collusive bidding.

4) Define lump sum contract

5) Differentiate between minor and reportable accidents

6) What is the technical purpose of vertical setback in case of tall buildings?

7) What are the factors affecting the valuation of property?

8) What is the basic philosophy behind the lean construction management?

9) What is BOCW?

10) What are the ways by which safety at the construction site can be ensured?

Course No: CE G527   **Date: 26-12-2022 [2:00 PM start]**
Duration: 90 Mins (Open book)   **Max. Marks: 40**

===

1) For a typical project, the details of the normal duration, normal cost, crash duration and crash cost of each of the activities are given below.   [12 marks]

Activity	Normal		Crash	
	Duration (days)	Cost (Rs.)	Duration (days)	Cost (Rs.)
(1-2)	3	5,000	2	7,000
(2-3)	4	6,000	2	12,000
(2-4)	3	9,000	1	15,000
(2-5)	4	5,000	3	9,000
(4-5)	5	7,000	2	16,000
(3-5)	3	8,000	1	9,500
(5-6)	5	20,000	5	20,000

Assume indirect expenses to be Rs. 10000/day. Determine the minimum project cost and the associated duration. The project duration more than 14 days attracts a penalty of Rs. 1000 and the project duration less than 14 will be rewarded with a special bonus of Rs. 500.

2 a) A newly constructed building stands on a plot costing Rs. 60,000 /-. The construction cost of the building is Rs. 2 Lakhs and the estimated life of the building is 60 years. The investor desired to have 10% return on the construction cost and 5% return on the land cost. Assuming annual repairs to be at 0.5% of the cost of construction and the other outgoings at 20% of the gross rent, calculate the annual rent that will have to be charged for the building. The annual instalment of the sinking fund for a life of 60 years of the building may be taken as 3% of construction cost [8 marks]

2 b) Is it possible to fix any rent? Are there any regulations?   [2 marks]

3) For the following data of a project a) prepare the month-wise running account bill, b) prepare the cash inflow diagram for the contractor, c) prepare the cash outflow diagram for the contractor.   [12 marks]

Value of contract: 78,25,000; Duration: four months.

The owner makes an advance payment of Rs. 5 lakhs, which is to be recovered equally from each running bill. Material advance – 10 lakhs to be recovered equally. The owner will recover from the payments made to the contractor two percent of the value of the work done as income tax deducted at source, and deposit this amount with RBI.

Item description	Unit	Total quantity	Rate	Amount	Quantities to be executed in			
					Month 1	Month 2	Month 3	Month 4
Earthwork excavation	Cubic meter	500	50	25,000	500			
R.C.C	Cubic meter	1000	4,000	4,000,000	250	500	250	
Brick work	Cubic meter	2000	1000	2,000,000	500	600	900	
Sanitary works	L.S.	----	----	Need to determine			50%	50%
Electrical works	L.S	-----	-----	2,00,000			50%	50%
Wood works	L.S.	----	---	250,000			50%	50%
Finishing works	Sq.m	4750	200	950,000				4750

Note: Contractor has prepared the construction schedule which has been approved by the owner.

Additional conditions and assumptions:

➢ The cost of a particular item is 85% of the quoted rate.
➢ The total cost for a particular item consisting of labour (20%), material (60%), plant and machinery (10%) and sub-contractor cost (10%).
➢ Assume that there is one-month delay in payment to labour and subcontractors.
➢ Retention is 10% of the billed amount in every bill. Fifty percent retention amount is payable after one month of practical completion while the remaining 50% is payable six months later.

4) What are the common problems (highlight six problems) associated with contracts which can lead to disputes?   [6 marks]