Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, December 2023

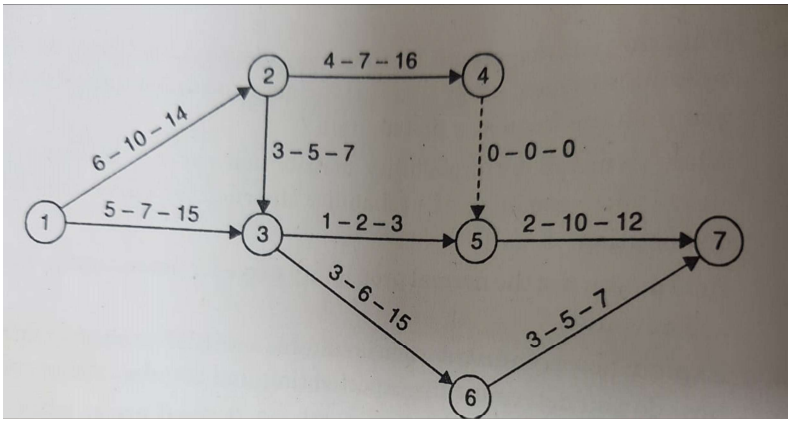
Course: Construction Engineering & Management **Semester: VII**

Program: B. Tech Civil Engineering **Time: 03 hrs.**

Course Code: CIVL 4065 **Max. Marks: 100**

Instructions: Use of calculator is permitted. All questions are compulsory.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q1	State the meaning of the terms mentioned below and state the reason of inclusion of such terms in a contract. 1. Fluctuation clause 2. Bonus and penalty clauses	**4**	**CO1**
Q2	Draw the beta distribution curve for PERT analysis. State the full name of the different notations used in the curve.	**4**	**CO2**
Q3	Determine the expected time for each path in the following diagram and state which path is critical. 	**4**	**CO3**
Q4	Fill in the blanks: 1. A dummy activity is a type of operation in a network which neither requires any _____ nor any _____, but is merely a device to identify a _____, among operations.	**4**	**CO1**
Q5	Explain the difference between the following terms after stating the definitions. 1. Optimistic time estimate	**4**	**CO2**

	2. Pessimistic time estimate 3. Most likely time estimate		
SECTION B (4Qx10M= 40 Marks)			
Q6	Explain the following conditions of the contract with relevant example for each term from a construction contract (lumpsum): 1. Security bond 2. Contractual changes and termination of contract. OR Explain modes of arbitration, implied conditions of arbitration and duties of the arbitrator.	**(5+5) 10**	**CO2**
Q7	Explain rights and duties of subcontractors. Include one example for each concept.	**(3+2+3+2) 10**	**CO2**
Q8	Explain the bar chart method for project management. List all its advantages and disadvantages.	**(3+3.5+3.5) 10**	**CO3**
Q9	Provide a pictorial representation of the process to be followed when awarding the contract. Explain each step after providing the pictorial representation. Consider the following when providing the relationships. Client – ONGC Project – Laying of onshore pipeline for transfer of gas from Assam to Tripura through Bangladesh. Note: 1. Bangladesh entity will have leasing revenue for facilitating the overland transit. 2. ONGC has to choose two contractors, one for laying the pipeline in Indian territory and one for Bangladesh territory. 3. Bangladesh law does not allow subcontracting to any foreign entity. 4. Transit fees / royalty will be paid by ONGC to the Ministry of Power, Energy & Mineral Resources, Bangladesh through a pre-approved nodal company in Bangladesh. 5. Official communication within India is English, in Bangladesh it must be in Bengali. 6. The Indian company that will be awarded the contract will have to coordinate its activities with the Bangladesh company. Translation may be required for intercompany communication as well as for communication with the Ministry of Power, Energy and Mineral Resources.	**(5+5) 10**	**CO2**

SECTION-C
(2Qx20M=40 Marks)

<table>
<tr>
<td>Q10</td>
<td>Refer to the details below and answer the following questions:
1. Explain the Gantt chart.
2. Refer to the details of the activities table and draw the Gantt chart.
3. Based on the chart, compute the total time required for completing the project.
4. If there is an increase of 4 weeks, required for the completion of Activity A, what will be the corresponding increase for the total time required for completing the project.

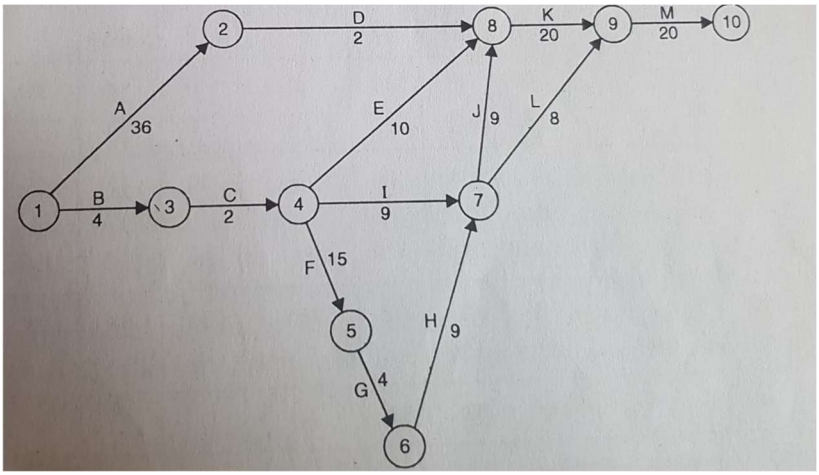
<table>
<tr><td>Activities</td><td>Duration in Weeks</td></tr>
<tr><td>A – Design</td><td>2</td></tr>
<tr><td>B – Marking layout</td><td>4</td></tr>
<tr><td>C – Excavation</td><td>2</td></tr>
<tr><td>D – Foundation work</td><td>4</td></tr>
<tr><td>E – Column casting</td><td>6</td></tr>
<tr><td>F – Construction of walls</td><td>4</td></tr>
<tr><td>G – Lintel</td><td>5</td></tr>
<tr><td>H – Roofing</td><td>4</td></tr>
</table>
Activity relationships are as under:

A and B can be performed in parallel.
C and D cannot start unless A is complete.
E cannot start unless D is completed.
F can only start after E is completed.
G succeeds F.
H is the last activity that should succeed E.

OR

Explain planning for network construction including the ways of planning used in the construction industry. Based on the same also describe the modes of network construction and the steps involved in development of network. Quote a relevant example in order to explain the aforementioned concepts.</td>
<td>(3+8+5+4)
20</td>
<td>CO4</td>
</tr>
<tr>
<td>Q 11</td>
<td>Solve the following numerical.
The network for a certain project is shown in the figure below, along with the estimated time of completion of each activity marked. Compute the activity times, total float, free float and independent float for each activity. Locate the critical path for the network.</td>
<td>(6+3+3+3+5)

20</td>
<td>CO4</td>
</tr>
</table>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4
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8
9
10
A
36
B
4
C
2
D
2
E
10
F
15
G
4
H
9
I
9
J
9
K
20
L
8
M
20