

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VII EXAMINATION – SUMMER 2026****Subject Code:3170614****Date:01-06-2026****Subject Name:Construction Engineering and Management****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1**
- (a) Explain benefit/cost ratio. **03**
- (b) Give the suitability of derrick, goliath and tower crane. **04**
- (c) Explain how mile stone chart is an improvement over bar chart and how the network diagram is an improvement over the milestone chart, hence discuss the advantage of a network diagram. **07**

- Q.2**
- (a) Enlist the factors to be considered to decide economic life of an equipment **03**
- (b) Define the term work breakdown structure. Prepare a work breakdown for single storeyed residential building **04**
- (c) Differentiate between activities and events. Project of Laying foundation consists of the following operations: excavation, laying of side boards and concreting of foundations. Draw a network consisting of activities and events to show the completion of the project **07**

OR

- (c) Define optimistic pessimistic and most likely time on a beta curve. Use the data of the following table to find the expected time for each activity. Verify the activity having most reliable time estimates **07**

Activity	Optimistic time	Pessimistic time	Most likely time
A	10	14	12
B	6	12	8
C	5	12	10

- Q.3**
- (a) Enlist the various components of operating cost of a construction machinery **03**
- (b) Give safety measures for scaffolding and excavation **04**
- (c) A project consists of seven activities P, Q, R, S, T, U, V of duration 10, 5, 10, 7, 5, 8 and 15 days. Draw a bar chart given the following: P and Q start simultaneously at time 0 independently, activity R starts only after Q is complete. S starts 3 days after P and Q start. Activity T starts only when S is complete. Activity U and R can start simultaneously when activity Q is complete. Activity V starts when P and S are complete, V marks the completion of the project. Draw the bar **07**

chart and find after how many days the project will be complete after starting at time zero.

OR

- Q.3** (a) Enlist various safety equipment for a mason working at construction site and the purpose they serve. **03**
 (b) Draw a line diagram of back hoe trench excavator and state name of its parts **04**
 (c) The table below gives the expected time of different activities and the. Draw the network. Find the expected time for each path and find the number of critical paths. Mark the dummy activity. **07**

Activity	Expected time
1-2	10
1-3	8
2-3	5
2-4	8
4-5	0
3-5	2
3-6	7
5-7	9
6-7	5

- Q.4** (a) Explain what is a winch and its utility. **03**
 (b) Differentiate between CPM and PERT **04**
 (c) Discuss the characteristics of lean construction methods over conventional construction. **07**

OR

- Q.4** (a) Explain giving examples activities in series and parallel **03**
 (b) What do you understand by a “dummy activity”. Give two examples. **04**
 (c) Prepare a breakdown of works and activities for construction an RCC highway and list the activities sequentially. Prepare the list of activities which can be performed in parallel. **07**
- Q.5** (a) Explain redundancies with reference to a network. **03**
 (b) How is critical path determined? Define float and different types of floats **04**
 (c) Describe the cube testing plan at the construction site. Discuss the statistics involved for acceptance and rejection of the construction. **07**

OR

- Q.5** (a) Explain why time cost trade is necessary **03**
 (b) Give the advantage of centrifugal pumps due to which it is commonly used at construction sites. **04**
 (c) Draw a neat sketch of conveyor belt system and explain various components. **07**
