

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3164014****Date:16-12-2022****Subject Name:Construction Project Planning 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) Identify the cost associated with site establishment of a construction project. | 03 |
| (b) Discuss the various stakeholders of a major construction project. | 04 |
| (c) Discuss the role of modern managerial aspects of efficient construction management. | 07 |
| Q.2 (a) What are the steps of planning a construction project? | 03 |
| (b) Define the following terms: (a) Activity and Event, (b) Float, and (c) Critical Path | 04 |
| (c) Enlist and explain various levels of a typical Work Breakdown Structure. Also give suitable example of each level. | 07 |
| OR | |
| (c) Explain with suitable example for various techniques of scheduling of a project. | 07 |
| Q.3 (a) What are the advantages and disadvantages of Bar Chart? | 03 |
| (b) Explain various types of floats with their equations. | 04 |
| (c) List out minimum 10 typical activities for construction of a Storage house at construction site having area of 50m x 50m. Give suitable duration and logical predecessor to each activity and draw network diagram for the same. | 07 |
| OR | |
| Q.3 (a) Discuss very briefly Line-of-Balance (LOB) method. | 03 |
| (b) Explain the following terminologies in terms of project crashing: (A) Cost Slope (B) Direct Cost (C) Indirect Cost (D) Crash Cost | 04 |
| (c) List out minimum 10 typical activities for construction of a Boundary wall for a building site having area of 50m x 50m. Give suitable duration and logical predecessor to each activity and draw network diagram for the same. | 07 |
| Q.4 (a) How Precedence Diagram method is different from Node diagram of network? | 03 |
| (b) Draw AON diagram for the activities listed below and find total project duration and critical path. | 04 |

| Activity | Duration (Days) | IPA |
|----------|-----------------|-------|
| A | 6 | ----- |
| B | 8 | A |
| C | 5 | A |
| D | 7 | A |
| E | 5 | B |
| F | 3 | C, B |

- (c) Draw AOA network diagram for the following activities and find the critical path. **07**

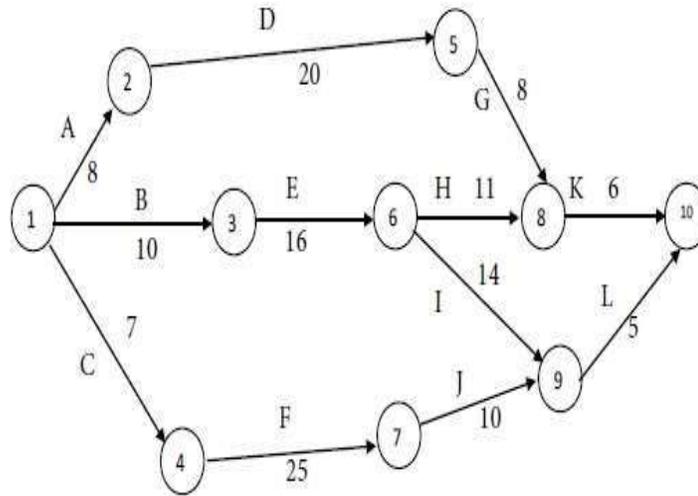
| Activity | IPA | Duration (Weeks) |
|----------|------------|------------------|
| A | --- | 4 |
| B | A | 6 |
| C | A | 2 |
| D | B | 10 |
| E | B | 4 |
| F | C | 3 |
| G | C | 5 |
| H | E | 4 |
| I | E, F | 8 |
| J | D, H, I, G | 9 |

OR

- Q.4** (a) Calculate the Estimated project completion time in days if the optimistic completion time and the pessimistic completion time are 120 days and 180 days, respectively. The project is most likely to be completed in 135 days. **03**
- (b) Explain the steps of project crashing for a typical project. **04**
- (c) Draw AOA network diagram for the following activities and find the critical path. **07**

| Activity | IPA | Duration (Weeks) |
|----------|------------|------------------|
| A | --- | 4 |
| B | A | 6 |
| C | A | 2 |
| D | B | 10 |
| E | B | 4 |
| F | C | 3 |
| G | C | 5 |
| H | E | 4 |
| I | E, F | 8 |
| J | D, H, I, G | 9 |

- Q.5** (a) Write down short note of Beta Distribution for the PERT analysis. **03**
- (b) For a construction project, the mean and standard deviation of the completion time are 200 days and 6.1 days, respectively. Assume normal distribution and use the value of standard normal deviate $Z = 1.64$. Compute the maximum time required (in days) for completion of the project work assuming 95% confidence level. **04**
- (c) Find out the completion time and critical activities for the following project. **07**



OR

- Q.5 (a) What do you understand by Network Updating? Why is it essential? **03**
 (b) Two experts A and B examined an activity and arrived at the following time estimates. **04**

| Expert | Time Estimate | | |
|--------|----------------|----------------|----------------|
| | T ₀ | T _m | T _p |
| A | 4 | 6 | 8 |
| B | 4 | 7 | 10 |

Determine which expert is more certain about his estimates of time.

- (c) Do the variance analysis of the following project after 7 days of starting of the project. The necessary data are given below. **07**

| Activity | Duration (days) | IPA | Cost/day | Total Cost | Actual % completed | Incurred Cost |
|----------|-----------------|-----|----------|------------|--------------------|---------------|
| A | 2 | --- | 300 | 600 | 100 | 600 |
| B | 3 | A | 400 | 1200 | 100 | 1400 |
| C | 3 | B | 400 | 1200 | 33.33 | 500 |
| D | 2 | B | 200 | 400 | 50 | 200 |
| E | 3 | D | 100 | 300 | 0 | 0 |

Find the following and give necessary comments on the performance of the project.

- (A) Cost Variance
 (B) Cost Performance Index
 (C) Schedule Variance
