

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3164014****Date:12-07-2023****Subject Name:Construction Project Planning and Management****Time:10:30 AM TO 01:00 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.

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|------------|--|-----------|
| Q.1 | (a) What do you understand by a critical activity? | 03 |
| | (b) What is the scope of Construction Project Management? | 04 |
| | (c) Explain Work breakdown Structure (WBS) of a 1 BHK residential house. Explain any one task up to activity level. | 07 |
| Q.2 | (a) What are various techniques for the scheduling of a project? | 03 |
| | (b) Differentiate CPM and PERT. | 04 |
| | (c) Explain the stages of construction project life cycle. | 07 |
| OR | | |
| | (c) What are the key steps involved in developing a construction project plan, and how can effective project management facilitate the successful completion of these steps? | 07 |
| Q.3 | (a) What is a critical path? | 03 |
| | (b) Draw AON diagram with the data given below in the table for a construction project. | 04 |

Activity	Predecessor Activity
A	-
B	A
C	A
D	B
E	B, C
F	C
G	D, E, F

- | | | |
|--|--|-----------|
| | (c) Enlist any 7 project teams and explain role of any one team. | 07 |
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OR

- | | | |
|------------|---|-----------|
| Q.3 | (a) What is a Bar chart? Explain with example. | 03 |
| | (b) Draw AOA diagram with the data given below in the table for a construction project. | 04 |

Activity	Predecessor Activity
A	-
B	A
C	A
D	B
E	B, C
F	C
G	D, E, F

- (c) Calculate Total float, Free float and Independent float for the activities given below in the table. **07**

Activity	Duration	ES	EF	LS	LF
1 – 2	2	0	2	7	9
1 – 3	4	0	4	0	4
1 – 4	3	0	3	9	12
2 – 5	1	2	3	9	10
3 – 5	6	4	10	4	10
4 – 6	5	3	8	12	17
5 – 6	7	10	17	10	17

ES = Earliest start time EF = Earliest finish time
 LS = Latest start time LF = Latest finish time

- Q.4** (a) Define optimistic time, pessimistic time, and most likely time. **03**
 (b) Explain different types of floats. Show how they are calculated. **04**
 (c) Draw AOA diagram for the project activities listed below in the table. Calculate project duration and critical path. **07**

Activity	Predecessor Activity	Duration (weeks)
A	-	4
B	-	5
C	-	6
D	A, B	3
E	B	4
F	B, C	5

OR

- Q.4** (a) What is a dummy activity? What is the duration of a dummy activity. **03**
 (b) What is resource allocation? **04**
 (c) Draw AON diagram for the project activities listed below in the table. Calculate project duration and critical path. **07**

Activity	Predecessor Activity	Duration (weeks)
A	-	4
B	-	5
C	-	6
D	A, B	3
E	B	4
F	B, C	5

- Q.5** (a) What is crashing of an activity? Also define cost slope. **03**
 (b) Explain the step-by-step process of Project Crashing. **04**

- (c) Crash the project with the activities given in the following table. The maximum amount for this crashing should not exceed Rs. 2500.

07

Activity	Predecessor Activity	Normal Time (weeks)	Crash Time (weeks)	Normal Cost (Rs.)	Crash Cost (Rs.)
A	-	7	6	15500	18500
B	A	12	9	11500	14500
C	A	22	21	19000	19500
D	B	11	10	8500	9500
E	C, D	6	5	4500	5000

OR

- Q.5 (a) What is BETA distribution?
 (b) What is Line of Balance (LOB) method?
 (c) For a construction project with following details,
 a) Draw network diagram for the project shown below.
 b) Calculate Mean and Variance for all the activities.
 c) Obtain critical path and project completion time.

03

04

07

Activity	Predecessor Activity	Optimistic Time	Most Likely Time	Pessimistic Time
A	-	6	7	8
B	-	3	5	7
C	-	4	7	10
D	A	2	3	4
E	B	3	4	11
F	C	4	8	12
G	C	3	3	9
H	E, F	6	6	12
I	D	5	8	11
J	H, G	3	3	9