

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3170614****Date:10/12/2021****Subject Name:Construction Engineering 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.

- Q.1** (a) Define the term work breakdown structure. Prepare a work breakdown structure of a compound wall. **03**
- (b) Prepare a job layout for an engineering college construction. **04**
- (c) Differentiate between quality control and quality assurances also write a short note on building and other construction workers act, 1996. **07**

- Q.2** (a) A precast plant consumes 30 tons of cement per month. The rate of cement is Rs. 2600 per ton. The order cost is Rs. 125/-. Inventory rate is 4.5%, determine economic order quantity. **03**
- (b) Differentiate between standard equipments and special equipments. **04**
- (c) From a given data of a project in tabular form draw the network, calculate total project duration, determine the critical path and also calculate total float, free float and independent float. **07**

Activity	A	B	C	D	E	F	G
Preceding Activity	-	A	A	B	B, C	D, E	E
Duration (Days)	3	2	3	5	6	5	4

**OR**

- (c) From the following information determine the cost of production for excavation and hauling in terms of rupees per cubic meter. **07**
- Excavating equipment used is Hoe with 1.33 m<sup>3</sup> dipper which can handle 1.51 m<sup>3</sup> having cycle time of 16 seconds & operating factor of 55 minute per hour with cost of Rs. 3500 per hour. Material is good common earth with swell of 20% and fill factor of 0.85. Hauling unit was trucks 8.5 m<sup>3</sup> (b.m.) capacity with operating factor of 50 minute per hour & having round trip time 22 minutes with cost of Rs. 400 per hour.

- Q.3** (a) States limitations of a bar chart. **03**
- (b) What is dummy activity? Under which circumstances dummy activity should be provided in a network? **04**
- (c) Explain functions of construction management. **07**

**OR**

- Q.3** (a) Explain mean, deviation and variance. **03**
- (b) Explain logic of precedence network. **04**
- (c) Under which circumstances LOB is preferable? State advantages of LOB. **07**

- Q.4** (a) Write short note on benefit/cost ratio. **03**
- (b) Differentiate between CPM and PERT. **04**

- (c) Explain step by step process of resource smoothening and resource levelling. **07**

**OR**

- Q.4** (a) Define cost slope. How to determine cost slope for activities? **03**  
 (b) Enlist various BIM software. Explain AI, Cyber Security and IoT as future trends in project management. **04**  
 (c) Original schedule of a small project is given below. Draw a network; determine total project duration and critical path. **07**

Activity	1-2	1-3	2-3	2-4	3-4	3-5	4-5	4-6	5-6
Duration (Days)	5	7	8	5	3	4	2	3	5

The above project was updated at the end of 10<sup>th</sup> day and following information was observed.

1. Activity 1-2 and 2-4 were completed as per schedule.
2. Activity 1-3 is completed in 5 days instead of planned 7 days.
3. Activity 2-3 started immediately after activity 1-2 was over. And it yet requires 5 more days.
4. Considering site condition duration of activity 3-4 and 3-5 are revised to 4 days and 5 days respectively.
5. Other activities are not having any change.

From the above information update the network. Also find total project duration and critical path of updated network.

- Q.5** (a) What are various indicators of a good quality structure? **03**  
 (b) Write a brief note on statistical quality control. **04**  
 (c) Explain safety measures for excavation. **07**

**OR**

- Q.5** (a) Draw a line diagram of dragline excavator and states name of its parts. **03**  
 (b) Prepare a comparative study between wheel mount and crawler mount tractor. **04**  
 (c) Draw a neat sketch of belt conveyor system and explain functions of various components. **07**

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