Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–I (NEW) EXAMINATION – WINTER 2023

Subject Code:3110004 Date:18-01-2024

Subject Name:Basic Civil Engineering

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)**	Convert (i) 2 miles to kilometer (ii) 10 acres to square meter of area (iii) Express one cubic meter to cubic feet of volume	**03**
	(b)	Explain batching of concrete and how it can be done	**04**
	(c)	Draw a neat sketch of roof top rainwater harvesting system and explain how you will calculate the storage volume requirements.	**07**
Q.2	**(a)**	State the permissible limits of the following parameters in drinking water for the following parameters as per IS Codes (i) BOD (ii) pH (iii) lead	**03**
	(b)	Compare the properties of conventional bricks with stones in respect of fire resistance, water absorbing capacity and strength.	**04**
	(c)	Discuss in detail how total station is a multipurpose instrument and explain its benefits with respect to speed and accuracy	**07**
		OR	
	(c)	Discuss the importance of remote sensing and GIS as modern Surveying tools	**07**
Q.3	**(a)**	Taking tread width for a flight of stairs to be 30 cm and individual risers to be 15 cm calculate the number of risers and treads for the vertical separation between the floors as 3.3 meters. State the number of riser after which landing will be provided.	**03**
	(b)	Explain Floor Space Index and its importance in building planning.	**04**
	(c)	Draw a proportionate line plan of a low-cost housing building having living room, bedroom, kitchen, washing platform and water closet. Mention sizes.	**07**
		OR	
Q.3	**(a)**	Discuss how the organic waste generated from kitchens for a small town should be managed and disposed off.	**03**
	(b)	Explain how proper orientation of a building can make it more energy efficient for the building located in tropical climate.	**04**
	(c)	Draw cross section through door for a single wall for a residential building from foundation bottom to parapet top showing spread footing foundation for 30 cm thick wall. Label the components and provide dimensions.	**07**
Q.4	**(a)**	Give the nominal dimension of a door in a residential building, chair for a single person and a single bed cot.	**03**
	(b)	Discuss how you will decide the plinth level of a building.	**04**

(c) The following consecutive readings were taken with a level and a 4meter levelling staff on a continuously sloping ground: 0.750, 1.535, 1.955, 2.430, 2.985, 3.480, 1.55 and 1.960. The reduced level of the first point was 100.750. The instrument was shifted after taking the sixth and the eighth staff reading. Calculate reduced level of all stations using the rise and fall method. **07**

OR

Q.4 **(a)** Convert the following whole circle bearings into quadrantal bearings: (i) 30º (ii) 120 º (iii) 340 º **03**

(b) Explain how water cement ratio affects the strength and workability of concrete. **04**

(c) Bearings of a four-sided closed traverse were observed as per the table below: **07**

Table for Q4(c)		
Line	F.B.	B. B.
AB	120°00 ’	300° 00’
BC	40° 00 ’	220° 00’
CD	300° 15’	120°15’
DA	200° 45 ’	20° 45’

Check for local attractions if any and calculate the internal angles.

Q.5 **(a)** Enlist three traditional building materials that were used in construction of historical heritage buildings of India. **03**

(b) Explain the concept and advantage of locally available materials in construction of green buildings **04**

(c) Discuss the structural measures taken which will make buildings less vulnerable to damage due to earthquakes. **07**

OR

Q.5 **(a)** Compare the properties of fiber reinforced polymers and plastic and hence give the application and uses of FRP. **03**

(b) What is the concept of BRTS? Discuss its advantages. **04**

(c) Discuss the existing gaps and problems in conservation of heritage buildings in India. **07**

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