Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) EXAMINATION – WINTER 2018

Subject Code:141301 **Date: 28/11/2018**

Subject Name: Design Of Environmental Structure

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. **Draw neat and clean figures, whenever required.**
5. **Use of IS 456, IS 800 and IS 875 Part I, II and III are permitted.**
6. **For RCC design M20 grade of concrete and Fe 415 grade of steel is used and for steel design Fe 250 grade of steel is used until otherwise stated**

Q.1	**(a)**	Elaborate the basic concept of pre tensioning and post tensioning.	**07**
	(b)	Draw neat figures beam to beam connection and beam to column connection for steel structures.	**07**
Q.2	**(a)**	Elaborate the codal provision of lacing.	**07**
	(b)	Elaborate the design steps of beam for flexure as per IS code provisions.	**07**
		OR	
	(b)	Enlist the design steps of slab base for a column.	**07**
Q.3		The tie of a roof truss carries an axial tension of 220 kN. Design the section of the member and also the connection of the member with suitable assumptions.	**14**
		OR	
Q.3		Design a circular short RCC column to carry an axial working load of 1620 kN. Design the column using lateral tie as well as helical reinforcement.	**14**
Q.4	**(a)**	Distinguish under-reinforced and over-reinforced design. Why the under reinforced design is preferred?	**07**
	(b)	Explain the design steps of one way simply supported slab.	**07**
		OR	
Q.4		Design a steel column to carry an axial load of 1520 kN. Select suitable section and assume necessary data if required.	**14**
Q.5		Design a square slope footing short RCC column to carry an axial working load of 1800 kN.	**14**
		OR	
Q.5	**(a)**	Enlist the design steps of shear design of RCC beam.	**07**
	(b)	Explain the serviceability criteria for the RC beam using IS code.	**07**

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