Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 141301 **Date: 01/06/2017**

Subject Name: Design Of Environmental Structure

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. **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 with necessary sketches about stiffened and unstiffened connections.	**07**
	(b)	Discuss the design steps for lacing system used in built up compression member.	**07**
Q.2	**(a)**	Sketch the sectional plan, elevation and side view of (i) beam to beam and (ii) column to beam framed connection	**07**
	(b)	Differentiate working stress and limit state philosophy to RCC design.	**07**
		OR	
	(b)	Distinguish under-reinforced and over-reinforced design. Why the under reinforced design is preferred?	**07**
Q.3		Explain the design steps of isolated footing with necessary checks. Explain these steps with taking suitable example. Also mention the codal guidelines.	**14**
		OR	
Q.3		Design a circular short RCC column to carry an axial working load of 1500kN. Design the column using (a) lateral tie and (b) helical reinforcement. Select the suitable reinforcement diameter for main reinforcement and lateral tie and helical reinforcement.	**14**
Q.4	**(a)**	Explain the basic concept of pre tensioning and post tensioning.	**07**
	(b)	Write the design steps of one way simply supported slab.	**07**
		OR	
Q.4		Design a steel column to carry an axial load of 1500kN. Select suitable section and assume necessary data if required.	**14**
Q.5		The tie of a roof truss carries an axial tension of 150kN. Design the section of the member and also the connection of the member with assuming necessary data.	**14**
		OR	
Q.5	**(a)**	Explain the design steps of slab base for a column.	**07**
	(b)	Explain the codal provision of battening.	**07**

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