Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1721504 **Date:14/05/2015**

Subject Name: Analysis and Design of Bridges

Time: 02:30 pm to 5:00 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 figures with pencil only.**
5. **Use of IRC-5, 6, 21 codes are permitted**
6. **Take M25 grade of concrete and Fe500 grade of steel, if not specified.**

Q.1	**(a)**	Explain pigeaudôs curve. Explain how it will be used in two way slabs of bridge.	**07**
	(b)	Explain the various criteria and guidelines to decide type of bridge.	**07**
Q.2	**(a)**	Explain the economical span length of a bridge.	**07**
	(b)	Draw different types of substructure option and designate each element of all sub structure options.	**07**
		OR	
	(b)	Calculate footpath live load for a bridge having effective span of 30 m and width of footpath of 1.2 m	**07**
Q.3		A two lane bridge has 25m centre to centre distance between supports and overall slab length 32m. It consists of three girders with greatest distribution factor 0.40 for central girder. Assume a suitable cross section of central girder near end support and design it for shear. Consider Class 70R tracked vehicles as critical load and total dead load of superstructure as 100 kN/m length. The end consists of 12 bars of 32mm diameter longitudinal steel. Take concrete grade M25 and steel grade Fe 415.	**14**
		OR	
Q.3		Design an RCC T-beam girder bridge for following details. (1). Clear Width of road way = 7.5 m (2). Span of bridge = 20 m (3). Live Load = IRC - Class AA Tracked Vehicle (4). Thickness of wearing coat = 80 mm (5). Use M-25, Fe-415 Design deck slab and main girder. Draw typical sketches	**14**
Q.4		Design a post tensioned prestressed concrete for following data. (1). Clear span = 20 m (2). Width of bearing = 400mm (3). Clear width of road way = 7.5m (4). Footpath of 1 m on either side, kerbs of 400 mm size (5). Wearing coat = 80 mm thick (6). Live Load: IRC- Class 70R Tracked Vehicle (7). M-40 grade concrete and High strength wires of 1620 MPa strength (8) Fe-415 for other reinforcement (9) Loss ratio = 0.82, Compressive strength at transfer = 35 MPa	**14**
		OR	
Q.4	**(a)**	Explain Hendry Jaeger Method and write its limitations.	**07**
	(b)	Elaborate the design steps of balanced cantilever bridge.	**07**

Q.5	**(a)**	Elaborate the design steps of well.	**07**
	(b)	Elaborate the design steps of box girder bridge.	**07**
		OR	
Q.5		Enlist and explain in detail various steps to analyze and design substructures at abutment location consisting of open foundation.	**14**

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