

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER– II(Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1721504**Date: 11/12/2015****Subject Name: Analysis and Design of Bridges****Time: 2:30 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. Use of all IRCs and Pigeaud's Curve are permitted.

- Q.1** (a) Explain the criteria for selection of type of bridge. **07**
(b) Explain Courbon's Method in Detail. **07**

- Q.2** (a) Classify the types of live load with neat sketches. **07**
(b) What do you understand by economical span of bridge? Discuss various parameters involved in deciding economical span of bridge. **07**

OR

- (b) Write advantages of Prestressed Concrete bridges. **07**

- Q.3** Design an RCC T-beam girder bridge for following details. **14**
(1). Clear Width of road way = 7.5 m
(2). Span of bridge = 14 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.

OR

- Q.3** Calculate vehicular live load design bending moment (without distribution factor) at L/2 for a two lane bridge on NH having c/c span of 21.5 m and overall slab length 23.5 m. Consider any two type of vehicular loads. **14**

- Q.4** (a) Draw different types of superstructure layout and designate each element of all superstructure options. **07**
(b) Write short note on Pigeaud's Curves and their uses. **07**

OR

- Q.4** Design a post tensioned prestressed concrete for following data. **14**
(1). Clear span = 16 m
(2). Width of bearing = 400mm
(3). Clear width of road way = 7.5m
(4). Footpath of 1 m on either side, kerbs of 500 mm size
(5). Wearing coat = 80 mm thick
(6). Live Load: IRC- Class AA Tracked Vehicle
(7). M-40 grade concrete and High strength wires of 1600 MPa strength
(8) Fe-415 for other reinforcement
(9) Loss ratio = 0.8, Compressive strength at transfer = 35 MPa

- Q.5** (a) Elaborate design steps of well. **07**
(b) Explain design of balanced cantilever bridges in detail. **07**

OR

- Q.5** Calculate design moments and axial force at the base of pier for following levels **14**
corresponding to road formation level 0.0 m.
Top of bearing pedestal = -2.0 m
Top of pier cap = -2.5 m, Bottom of Pier Cap = -4.3m, Bottom of Pier = -12.3m
Assume suitable c/s of pedestal block, pier cap and pier which carries
superstructure of span 24 m on both sides. The dead load reaction from each
side of superstructure is 1800 kN. Account only IRC- Class AA type vehicular
load. Neglect External Lateral loads.
