## GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER-II(Old course) • EXAMINATION (Remedial) - WINTER- 2015

Subject Code: 1721504 Date: 11/12		Code: 1721504 Date: 11/12/2015	2015	
Subject Name: Analysis and Design of Bridges Time:2:30 pm to 5:00 pm Total Marks: Instructions:			)	
instru	1. 2. 3. 4.	, Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. Use of all IRCs and Pigeaud's Curve are permitted.		
Q.1	(a)	Explain the criteria for selection of type of bridge.	07	
	<b>(b)</b>	Explain Courbonøs Method in Detail.	07	
Q.2	(a) (b)	Classify the types of live load with neat sketches. What do you understand by economical span of bridge? Discuss various parameters involved in deciding economical span of bridge.	07 07	
	(b)	Write advantages of Prestressed Concrete bridges.	07	
Q.3		<ul> <li>Design an RCC T-beam girder bridge for following details.</li> <li>(1). Clear Width of road way = 7.5 m</li> <li>(2). Span of bridge = 14 m</li> <li>(3). Live Load = IRC - Class AA Tracked Vehicle</li> <li>(4). Thickness of wearing coat = 80 mm</li> <li>(5). Use M-25, Fe-415</li> </ul>	14	
		Design deck slab and main girder. Draw typical sketches.		
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 Pigeaudøs Curves and their uses.	07	
Q.4		<ul> <li>Design a post tensioned prestressed concrete for following data.</li> <li>(1). Clear span = 16 m</li> <li>(2). Width of bearing = 400mm</li> <li>(3). Clear width of road way = 7.5m</li> <li>(4). Footpath of 1 m on either side, kerbs of 500 mm size</li> <li>(5). Wearing coat = 80 mm thick</li> <li>(6). Live Load: IRC- Class AA Tracked Vehicle</li> <li>(7). M-40 grade concrete and High strength wires of 1600 MPa strength</li> <li>(8) Fe-415 for other reinforcement</li> <li>(9) Loss ratio = 0.8, Compressive strength at transfer = 35 MPa</li> </ul>	14	
Q.5	(a) (b)	Elaborate design steps of well. Explain design of balanced cantilever bridges in detail.	07 07	

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.

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