Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER III– • EXAMINATION –WINTER- 2016

Subject Code: X30602 **Date:02/01/2017**

Subject Name: Railway Bridge and Tunnels

Time:10:30 AM to 1:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the ideal bridge site characteristics? What are the essential information required to be collected for the design of a bridge?	**07**
	(b)	Compare Railway transportation with Road transportation.	**07**
Q.2	**(a)**	Why the uniformity of gauges is desirable in any country? Explain	**07**
	(b)	Explain with sketches: Fish plate, Dog spikes, C.I. Chair with spring keys.	**07**
		OR	
	(b)	Describe with a neat sketch of diamond crossing in railways and list its important features.	**07**
Q.3	**(a)**	Define the followings (a) Ruling gradient (b) Pusher gradient (c) Momentum gradient (d) Compensated gradient for curvature.	**07**
	(b)	Explain in brief: (i) Marshaling yards. (ii) Types of Station	**07**
		OR	
Q.3	**(a)**	Calculate the maximum permissible speed on a curve of high speed B. G. group "A" route having the following particulars. Degree of the curve - 1 degree Superelevation - 80 mm Length of transition curve – 120 meter Maximum sanctioned speed – 160 kmph	**07**
	(b)	Compare the relative merits and demerits of wooden and concrete sleepers. Discuss the factors on which sleeper density depends.	**07**
Q.4	**(a)**	Explain in brief: (i) Scour depth. (ii) Waterway	**07**
	(b)	What are the functions of bridge bearings? Explain with sketches: Rocker bearing, Roller bearing.	**07**
		OR	
Q.4	**(a)**	Explain with sketch: Suspension bridge, Boat bridge.	**07**
	(b)	Explain the methods of strengthening a bridge superstructure	**07**
Q.5	**(a)**	Describe with sketch the procedure to transfer the centre line inside the tunnel.	**07**
	(b)	Enlist various methods of tunneling in hard rock. Explain any two of them with sketches.	**07**
		OR	
Q.5	**(a)**	Under which circumstances do you prefer Tunneling? Classify the tunnels according to their shape and size.	**07**
	(b)	Give a brief note on: (i) drainage in tunneling, (ii) Tunnel ventilation.	**07**

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