Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEMESTER– VI • EXAMINATION – SUMMER 2015

Subject Code: 160603 Date:08/05/2015

Subject Name: Railway, Bridge and Tunnel Engineering

Time:10.30AM-01.00PM 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)**	Discuss the merits of railway transport over the highway transport.	**07**
	(b)	Explain with sketches different types of steel bridges.	**07**
Q.2	**(a)**	Enlist various methods adopted for tunneling in rocks. Explain with sketch any one method.	**07**
	(b)	Draw a typical sketch of cross-section of B.G. track for double line in cutting and show its components.	**07**
		OR	
	(b)	Discuss the necessity and effects of coning of wheel and tilting of rails.	**07**
Q.3	**(a)**	Discuss the criteria for deciding the cross section and length of rails.	**07**
	(b)	Explain the necessity of grade compensation at curves. The ruling gradient has been fixed as 1 in 200 on a section of B. G. track. What should be the compensated gradient when a 4^0 horizontal curve is also to be introduced on this ruling gradient?	**07**
		OR	
Q.3	**(a)**	Explain the functions of fish plates and fish bolts. What are the essential requirements of fish plates?	**07**
	(b)	Clearly define 'Equilibrium Cant' and 'Cant Deficiency'. What would be equilibrium cant on a M. G. track of 5^0 curve for a speed of 60 kmph? What would be the maximum permissible speed after allowing the maximum cant deficiency?	**07**
Q.4	**(a)**	Draw a typical sketch of Fixed heel type switch. Briefly explain its various components.	**07**
	(b)	Describe various factors affecting in selection of a bridge site.	**07**
		OR	
Q.4	**(a)**	Explain with sketch a junction railway station consisting of a main line and a branch line.	**07**
	(b)	Briefly explain the following terms and show their mathematical expressions used for bridge hydrological calculations: (i) Linear water way, (ii) Afflux, (iii) Scour depth.	**07**
Q.5	**(a)**	What is the importance of shafts in tunneling? Describe with sketches various operations involved in construction of shafts.	**07**
	(b)	What are the requirements of the ideal bearings of bridge? Discuss with sketches different types of bearings used in concrete bridges.	**07**
		OR	
Q.5	**(a)**	What is the necessity of ventilation and dust control in tunneling? Explain with sketches their methods.	**07**
	(b)	Discuss in brief: Maintenance of (i) Steel bridges, (ii) Concrete bridges.	**07**

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