

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019****Subject Code: 2160603****Date: 09/12/2019****Subject Name: Railway, Bridge & Tunnel Engineering****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

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

		MARKS
Q.1	(a) Draw a neat sketch of the cross sections of a B.G. railway track in embankment.	03
	(b) Discuss relative merits and demerits railways in comparison of roadways.	04
	(c) Enlist various types of sleepers and discuss concrete sleepers in details.	07
Q.2	(a) Enlist various types of spikes and explain any one in brief.	03
	(b) Discuss functions and requirements of Ballast.	04
	(c) Discuss about causes and effects of creep. Also write measures to reduce creep.	07
	OR	
	(c) Find out the steepest gradient on a straight track using the following data:	07
	(1) No. of wagons = 20	
	(2) Weight of each wagon = 18 t	
	(3) Rolling resistance of wagon = 2.5 kg/t	
	(4) Speed of train = 50 kmph	
	(5) Weight of locomotive = 120 t	
	(6) Tractive effort of locomotive = 12 t	
	(7) Rolling resistance of locomotive = 3.5 kg/t	
Q.3	(a) Explain train resistance due to friction.	03
	(b) Write short note on 'super elevation' or 'cant'.	04
	(c) A transition curve is to be used to join the ends of a 3.94° circular curve with the straight on a B.G. track. The length of transition curve is 120 m. Work out the shifts and off-sets at every 30 m interval.	07
	OR	
Q.3	(a) Discuss metro rail in brief.	03
	(b) Explain causes of rail accidents and their remedial measures.	04
	(c) With the help of neat sketch explain components of a bridge.	07
Q.4	(a) Write brief note on bridge alignment.	03
	(b) Describe history of bridge developments.	04
	(c) Write short note on hydraulic design of bridge.	07
	OR	
Q.4	(a) Explain ideal bridge site characteristics.	03
	(b) Discuss erection of steel girders.	04
	(c) Enumerate the general maintenance works for the steel and concrete bridges.	07
Q.5	(a) Why tunnels are constructed? Describe its advantages.	03
	(b) Write short note on safety in tunnel construction.	04

OR

- Q.5** (a) Give classification of tunnels. **03**
- (b) What is the necessity of drainage in tunnel? Discuss various drainage systems for tunnel. **04**
- (c) What is the necessity of ventilation and dust control in tunneling? Explain with sketches their methods. **07**

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