GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI • EXAMINATION - SUMMER 2013

Subject Code: 160603 Date: 28-05-2013 Subject Name: Railway Bridge and Tunnel Engineering Time: 10.30 am - 01.00 pm **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. **O.1** (a) Discuss the role played by Railways in overall development of a nation. Draw a neat 07 sketch of typical Railway Track and show its components. (b) What are the ideal bridge site characteristics? What is the essential information 07 required to be collected for the design of a bridge? (a) Enlist various methods adopted for tunneling in soft ground. Explain with sketch any 07 Q.2two methods. (b) Define gauge of a railway track. Which gauges are used in India? Discuss their 07 suitability at different locations with reasons. (b) Explain the followings with sketch: Tractive resistance, Buckling of rails, Negative 07 super elevation. (a) What would be an equilibrium cant on a B.G. track of 2° curve for a speed of 70 07 0.3 kmph? What would be the maximum permissible speed after allowing the maximum cant deficiency? **(b)** Compare the relative merits and demerits of wooden and concrete sleepers. Discuss **07** the factors on which sleeper density depends. Calculate the maximum permissible speed on a curve of B.G. track having following 0.3 details: (i) Degree of curve = 4⁰, (ii) Amount of S.E. = 6.2 cm, (iii) length of transition curve = 70 m. (b) Explain with sketches: Junction fish plate, Dog spikes, C.I. Chair with spring keys. 07 (a) Compare the different ballast materials with respect to merits, demerits and suitability **07 Q.4** of each material. **(b)** Explain with sketch: Suspension bridge, Bascule bridge. **07** (a) What are the functions of points and crossings in railway track layout? Draw a neat **Q.4** 07 diagram of Diamond Crossing and show its various component parts. (b) What do you understand by Economic Span of Bridge? Derive the necessary 07 expression for obtaining economic span of the bridge. (a) Explain with sketch tunnel ventilation. Q.5 07 (b) What are the loads acting on bridges? What are the factors affecting for selection of types of bridge foundation? OR (a) Discuss about (i) Tunnel Lining and (ii) Lighting in Tunnels. 07 Q.5 (b) What are the functions of bridge bearings? Explain with sketches: Rocker bearing, 07 Roller bearing.
