

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.

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