

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 160603****Date: 27/04/2017****Subject Name: Railway , Bridge & Tunnel Engineering****Time: 10:30 AM to 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) Compare Railway transportation with Road Transportation. Draw a neat sketch of typical of typical Railway Track and show its Components. **07**  
(b) Enlist the various factors affecting selection of Railway Gauge. Write short note on Loading Gauge and Construction Gauge. **07**
- Q.2** (a) Explain Coning of Wheels with neat sketch. **07**  
(b) What are the functions of Rails? Explain the various types of Rails in use. **07**
- OR**
- (b) Enlist the various types of Sleepers mostly in use in Indian Railways. Enlist the various advantages and disadvantages of Steel and Reinforced Concrete Sleepers. **07**
- Q.3** (a) Explain in brief Diamond Crossing and Scissors Crossing with a neat sketch. **07**  
(b) Briefly explain different types of gradients used in Railway. What is grade compensation? What would be equilibrium cant on a M.G track of  $6^\circ$  curve for a speed of 50 Km/h? What would be the maximum permissible speed after allowing the maximum cant deficiency? **07**
- OR**
- Q.3** (a) Briefly explain: Momentum Gradient, Grade Compensation, Cant deficiency. **07**  
(b) A  $6^\circ$  curve diverges from a  $3^\circ$  main curve in reverse direction in the layout of B.G track yard. If the speed on the branch line is restricted to 40 km/h, determine the restricted speed on the main line. **07**
- Q.4** (a) Explain the functions of fish plates and fish bolts. What are the essential requirements of fish plates? **07**  
(b) Explain about ideal bridge site characteristics. **07**
- OR**
- Q.4** (a) What is the meaning of “Economic Span” of a bridge? Also state how is it determined. **07**  
(b) Explain with sketch the erection of steel arch Bridges. Also explain in brief Suspension Bridges. **07**
- Q.5** (a) Enlist the various methods of tunneling in hard rock. Explain any two of them with sketches. **07**  
(b) Under which circumstances do you prefer Tunneling? Classify the tunnels according to their shape and size. Explain any two of them with neat sketch. **07**
- OR**
- Q.5** (a) Explain in brief: a) Advantages of Tunnel b) Lighting and Ventilation in Tunnel. **07**  
(b) How are Shafts classified? **07**

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