

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (OLD) EXAMINATION – WINTER 2018****Subject Code:160603****Date: 16/11/2018****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.

- 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) Explain loading gauge and construction gauge with figure. **07**
- Q.2** (a) Define permanent way. What are the requirements of ideal permanent way? **07**
- (b) Briefly explain semaphore signals and coloured light signals. **07**
- OR**
- (b) Write a short note on scissors cross over **07**
- Q.3** (a) Discuss methods of testing and strengthening of bridges. **07**
- (b) Explain various types of rails with sketches **07**
- OR**
- Q.3** (a) Describe with sketches: (i) Coning of wheels, (ii) Creep of rails. **07**
- (b) Briefly explain the factors affecting selection of bridge site. **07**
- Q.4** (a) Write short note on safety precautions in tunneling. **07**
- (b) Explain with formulae for the bridges: Design discharge, Linear water way, Afflux, Scour depth, Economical span. **07**
- OR**
- Q.4** (a) Explain with sketch tunnel ventilation **07**
- (b) What are the different types of bearings used in bridges? Discuss their relative merits. **07**
- Q.5** (a) Describe with sketches procedure of fixing alignment in short and long tunnels. **07**
- (b) What do you understand by 'Economic Span of Bridge'? Derive the necessary expression for obtaining economic span of the bridge. **07**
- OR**
- Q.5** (a) Enlist various methods of tunnelling in hard rock. Explain any one in detail. **07**
- (b) State the classification of bridges based on different factors. **07**
