

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- VIth SEMESTER-EXAMINATION – MAY- 2012****Subject code: 160603****Date: 15/05/2012****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)** Compare Railway transportation with Road transportation. **04**
(b) Draw a detailed sketch showing cross section of a B.G. track for double line with electric traction. **04**

- (c)** Briefly explain various types of loads and stresses acting on a bridge. **06**
Q.2 (a) State different types of surveys conducted before fixing railway alignment. Explain any two. **07**
(b) Briefly explain different types of gradients used in railway. What is grade compensation? Compute the same for horizontal curve of 3° on B.G. track having ruling gradient of 1:200. **07**

OR

- (b)** Define: (i) Equilibrium cant, (ii) Cant deficiency. What would be equilibrium cant on a M.G. track of 5° curve for a speed of 40 kmph? What would be the maximum permissible speed after allowing the maximum cant deficiency? **07**
Q.3 (a) Describe with sketches: (i) Coning of wheels, (ii) Creep of rails. **07**
(b) What are the facility requirements of a railway station? Classify the railway stations. Draw a neat sketch of layout of any one type of station. **07**

OR

- Q.3 (a)** Draw a neat sketch of simple left hand turnout and show its various component parts. Explain the working principle of the turnout. **07**
(b) What are the objectives of signaling and interlocking in railway? Discuss with sketches different types of signals used in railway. **07**
Q.4 (a) Explain with formulae for the bridges: Design discharge, Linear water way, Afflux, Scour depth, Economical span. **07**
(b) Write the requirements of ideal bridge bearings. Explain with neat sketches various types of bearings used for steel bridges. **07**

OR

- Q.4 (a)** Classify the bridges according to their super structure's load taking behaviour. Draw a detailed sketch of plan and cross section of bridge showing its all components. **07**
(b) Discuss with sketches: (i) Erection of steel arch bridge, (ii) Maintenance of bridges. **07**
Q.5 (a) Under which circumstances do you prefer Tunneling? Classify the tunnels according to their shape and size. Explain with sketch any two of them. **07**
(b) Describe with sketches procedure of fixing alignment in short and long tunnels. **07**

OR

- Q.5 (a)** Enlist various methods of tunneling in hard rock. Explain any two of them with sketches. **07**
(b) Discuss with sketches ventilation, drainage and safety measures in tunnel construction. **07**
