GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2154004   **Date:04/12/2018**

Subject Name:Railway & Bridge 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.
4. Support your answer with neat sketches wherever possible.

Q.1	**(a)**	Discuss the role of railway transportation in development of a nation.	**05**
	(b)	Draw a typical cross section of a permanent way. Write down the basic functions of various components of the railway track.	**06**
	(c)	Briefly explain: Grade compensation, Kink, Capacity of track.	**03**
Q.2	**(a)**	Discuss: why the uniformity of gauges in railway is necessary?	**03**
	(b)	What are the basic requirements of good railway track alignment? Briefly discuss factors which control the alignment of a railway track.	**04**
	(c)	Discuss: (i) Cant deficiency, (ii) Negative super elevation - for the railway track.	**07**

OR

	(c)	Write short note on: (i) Tractive resistance, (ii) Coning of wheel.	**07**
Q.3	**(a)**	Discuss the factors on which sleeper density depends and how the sleeper density is expressed.	**03**
	(b)	Draw detailed elevation and sectional side view of typical R. C. C. girder bridge with well foundation and show all the components.	**05**
	(c)	Calculate the maximum permissible speed on a curve of high speed BG track having 2^0 curve, 8 cm super elevation and 160m long transition curve.	**06**

OR

Q.3	**(a)**	Draw the neat diagram of simple right hand turnout. Show its various parts.	**04**
	(b)	Briefly describe: (i) Automatic Block System, (ii) Centralized Traffic Control (CTC) System.	**04**
	(c)	From a layout of B.G. yard, 8^0 curve branches off from a 4^0 main curve in an opposite direction. If speed is restricted to 30 kmph on branch line, determine the speed restriction on the main line.	**06**
Q.4	**(a)**	Briefly explain following terms and write their formulae for the computation: Afflux, Design scour depth.	**04**
	(b)	What are the functions of bridge foundations? What are the factors affecting for selection of types of bridge foundation?	**04**
	(c)	Compute the design discharge and linear water way for the river bridge site from the following data: River cross sectional area = 900 sq.m, Wetted perimeter = 300 m, River bed slope = 1: 2000, Coefficient of roughness = 0.03, Lacey's constant = 4.8.	**06**

1

OR

Q.4 **(a)** What are the functions of bridge bearings? What are the requirements **04** of ideal bridge bearings?

(b) Draw neat sketches: Deep base bearing, Rocker bearing, Sliding plate **04** bearing, Roller bearing.

(c) Determine the number of spans and each span length of a river bridge **06** from the following data: Design discharge = 1400 m^3/s, Silt factor = 0.6, Afflux = 1m, Free board = 1.2m, Width of stream at HFL = 200m.

Q.5 **(a)** What are the objects of river training works? Explain with sketches **05** various types of river training works used for the bridges.

(b) Discuss with sketches IRC Class 70R loading for Tracked vehicle and **05** Wheeled vehicle.

(c) Describe the importance of health monitoring of bridges. **04**

OR

Q.5 **(a)** Briefly describe with sketches 'Erection of Suspension Bridge'. **05**
(b) Explain with sketches NDT tests for bridges. **05**
(c) Discuss various repair and retrofitting measures can be adopted for R. **04** C. C. highway bridge.

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