

END TERM EXAMINATION

EIGHTH SEMESTER [B.TECH] MAY-JUNE 2018

Paper Code: ETCE-406

Subject: Analysis and Design of Bridges
(Batch 2013 Onwards)

Time: 3 Hours

Maximum Marks: 75

Note: Attempt five questions in all including Q no. 1 which is compulsory. Select one question from each unit. Assume any data suitably if missing and mention it before solving the question.

Q1/ Attempt the **any five** questions:-

(5x5=25)

- (a) What is the function of bearing in bridges?
- (b) Describe Courbon's method for load distribution and indicate its limitation.
- (c) What are the components of a bridge?
- (d) Explain the factors influencing the flood discharge in a river.
- (e) How the afflux is caused and how its value estimated.
- (f) What is economical span?

UNIT-I

Q2 What is racking force? Explain how the dynamic-effect is considered in railway bridge design, giving suitable example/case/data. (12.5)

- Q3 (a) A bridge is proposed to be constructed across an alluvial stream carrying a discharge of $300 \text{ m}^3/\text{s}$. Assuming the value of silt factor=1.1, determine the maximum scour depth when the bridge consists of (i) Two span of 30 m each (ii) Three span of 30 m each. (7.5)
- (b) Explain how you would measure the discharge of a river using any suitable method. (5)

UNIT-II

- Q4 Write short note on:- (4+4+4.5=12.5)
- (a) Balanced Cantilever bridge
 - (b) Box-culvert bridge
 - (c) T-Beam bridge
- Q5 Explain different kinds of arch bridges. What are the various forces considered while designing an arch bridge? Give suitable example with typical values. (12.5)

UNIT-III

- Q6 Describe the main features of cable stayed bridge. Sketch the different types of towers for cable stayed bridge. (12.5)
- Q7 What are the various kinds of expansion bearing for girder bridge? State the circumstances under which each would be appropriate. (12.5)

UNIT-IV

- Q8 What are the advantages of pre-stressed concrete bridges? Describe the pre-stressing assembly of steel. (12.5)
- Q9 Write the different steps for design of a longitudinal girders for design of post-tensioned prestressed concrete T-Beam slab bridge deck with relevant formulate. (12.5)
