R13

B.Tech IV Year I Semester (R13) Supplementary Examinations June 2017
BRIDGE ENGINEERING
(Civil Engineering)
(Use of IS and IRC codes are permitted in the examination hall)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
  (a)   What is impact factor for IRC class A loading?
  (b)   Give mathematical expression for coefficient of dynamic augment (CDA).
  (c)   Explain the gauges which are used in railways.
  (d)   Name the IRC loads (IRC 6-2000).
  (e)   What is effective width for single concentrated load?
  (f)   What is the Poisson's ratio for concrete as per IRC 21-2000?
  (g)   What is reaction factor as per Courbon's theory?
  (h)   What is expansion type of bearing?
  (i)   Name the types of wing walls.
  (j)   How much the minimum straight length of approaches required for either side of the bridge as per IRC specifications?

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   (a) What are the different types of live loads consider in the design of RCC bridges?
    (b) What are the different types of bearings consider in the design of RCC bridges? Explain them.
OR
3   Design a RCC box culvert with clear vent way of 3 m x 3 m, the super imposed dead load in the culvert is 13 kN/m^2. The live load on the culvert is 50 kN/m^2. The density of soil at the site is 18 kN/m^3, angle of repose is 30°. Use M20 and Fe415 materials.

UNIT – II

4   (a) Explain the effective width method analysis for deck slab bridges.
    (b) Draw the plan and elevation of deck slab bridge for NH two lane road way.
OR
5   Design a RCC slab culvert for NH two lane with foot path of 1.0 m on either side with a clear span 6.0 m and width of bearings 400 mm. The materials used for deck slab is M25 and Fe415. Design the slab culvert for class A-A tracked vehicle.

UNIT – III

6   (a) What are the different methods available for the design of longitudinal girders of T-beam bridges? Explain any one in detail.
    (b) Write about Pigeaud's method for analysis of T-beam bridge slabs.
OR
7   Design RCC T-beam deck slab of a NH two lane bridge with effective span of 16.0 m subjected to IRC class A-A tracked vehicle with M25 and Fe415 grade materials.

UNIT – IV

8   Arrive the cross-section of a plate girder for railway bridge (single lane) with effective span of 30 m and dead load on the open floor 7.5 kN/m. Equivalent total load for BM calculation per track is 2727 kN and for shear is 2927 kN.
OR
9   Design the shear connection for composite bridge with a thickness of concrete deck slab 300 mm and with plate girders spacing of 2 m c/c. The size of the flanges are 500 x 30 mm and web is 1000 x 10 mm. The vertical shear at the design section is 550 kN. Assume suitable data if required.

UNIT – V

10   What are the different types of piers used for bridges and explain them with neat sketches?
OR
11   Write short notes on:
  (a)   Stability analysis of abutments.
  (b)   Types of wing walls.
  (c)   Types of bridge foundations.

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