

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2016

BRIDGE ENGINEERING

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

(Use of codes IRC:6-2000, IRC:21-2000, IS 456:2000, IS 800:2007, IRC:83-(Part-I)-1999, IRC:83-(Part-II)-1987 and Pigeaud's curves is permitted in the examination hall)

- 1 (a) What are the important requirements of an ideal project? Mention the various considerations important from the point of view of selection of a suitable site for the same.
(b) Explain the various IRC bridge loading in the design of highway bridges.
- 2 Design a box culvert with the following data:
Inner dimension: 2.75 x 3.0 m
Loading : IRC class AA (tracked)
Materials : M₃₀ concrete and Fe415 grade steel
Type of road : Two lane
Height of the embankment above the box = 1.25 m
Unit weight of soil = 17.5 kN/m³
Type of stream : non – perennial
- 3 Design one series of simply supported of R.C.C deck slab bridge for IRC class AA tracked load for the following data.
Clear span : 7.0 m
Clear road width : 6.6 m
Thickness of pier : 1.0 m
Kerb width : 225 mm
Thickness of weariness coat : 75 mm
Materials: M₂₅ concrete and Fe415 grade steel.
- 4 Obtain Courbon's reaction factor and maximum bending moment in case of a T-beam bridge have the following data.
Road way : 2 lanes
Loading : IRC class AA tracked
No.of main girders 3 and spaing 2.5 m
Span of the bridge = 16 m
Kerb width = 750 mm on either side.
- 5 (a) What are the steps involved in the design of plate girder?
(b) What is meant by curtailment of plates and how this done in the plate girders?
(c) When do you provide splicing of webs and flanges?

Contd. in page 2

- 6 Design a composite bridge super structure with the following data:
Span : 18 m
No. of lanes : Two
Line load : IRC class A – A tracked
Materials: M₃₀ and Fe500 steel.
- 7 Design an elastomeric unreinforced pad bearing for the following data:
Vertical load = 250 kN
Horizontal force = 75 kN
Modulus of rigidity of elastomer = 1.2 N/mm²
Friction coefficient = 0.45.
- 8 Write short note on:
(a) Types of piers.
(b) Forces acting on piers.
(c) Stability analysis of piers.
(d) Types of wing walls.
(e) Types of bridge foundations.
(f) Different types of abutments.

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