

Code: 9A01702

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2017

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 are permitted in the examination hall)

- 1 Explain the various types of IRC loadings in the design of highway bridges.
- 2 Design the RC box culvert bridge without check for shear and design of slab, situated in the state highway with following data:
Width of the bridge: 12 m
Wearing course: 56 mm thick
Condition of exposure: Moderate
Depth of foundation: 1.35 m
Clear span: 5 m
Height of the vent: 3 m
Load case: AA tracked vehicle
M25 grade concrete and HYSD bars.
- 3 An RCC deck slab is to be constructed over a channel on a national highway for class AA tracked vehicles. The effective span is 4.7 m. calculate the net effective width of dispersion for two wheels of class AA tracked vehicle by effective width method.
- 4 (a) Explain in brief Pigeaud's method of determining B.M in slabs.
(b) Write a note on 'Impact Factor' for bridges.
- 5 Explain the various components of the plate girder bridge along with the design procedure.
- 6 Write the advantages of the composite bridge. Briefly explain the behavior of the composite bridge
- 7 Design an elastomeric pad bearing to support a tee beam girder of a major bridge using the following data:
Maximum dead load reaction/bearing = 340 kN
Maximum load reaction/ bearing = 550 kN
Longitudinal force due to friction for each bearing = 35 kN
Effective span of the girder = 23 m
Estimated rotation at bearing of the girder due to dead and live loads = 0.003 radians. M20 grade concrete is used. Total estimated shear strain due to creep, shrinkage and temperature = 5×10^{-4} units.
Draw the details of the bearing.
- 8 (a) What are the various types of piers with neat diagrams?
(b) Explain the general features of abutments.
