

Code No: R204101B

R20

SET - 1

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Advanced Supplementary Examinations March 2025

BRIDGE ENGINEERING

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions. **ONE** Question from **Each unit**

All Questions Carry Equal Marks

Use of IRC:6-2017 is Permitted

UNIT-I

1. a) Discuss about different bridges “on the basis of nature of traffic, loading, number of lanes, position of carriage way and load transfer mechanism”. [7M]
- b) Develop the equation for economical span and list the assumptions made. [7M]

(OR)

2. a) Discuss the factors you will consider during the appropriate site selection for a bridge in detail. [7M]
- b) Illustrate about different types of foundations with neat sketches? [7M]

UNIT-II

3. Explain about Effective width method for computing live load moments for slab bridges and dispersion length. [14M]

(OR)

4. List different methods used for the analysis of bridge decks and Explain Courbon’s method in detail. [14M]

UNIT-III

5. A reinforced concrete simply supported slab is required for the deck of a road bridge having the following data: [14M]
Clear span = 5.5m.
Width of carriage way = 7.5 m.
Foot path on either side = 1m wide.
Materials=M20 grade concrete and Fe415 steel.
Type of loading IRC class AA. Design the deck slab and also show the reinforcement details.

(OR)

6. Design the interior panel of a RC-T beam bridge using following data. [14M]
Clear width of road way = 8.0m
Effective span = 18.0m
Live load = IRC class AA
Use M20 concrete and Fe415 Steel.

UNIT-IV

7. Explain the Design Principles of Plate girder bridge in detail. [14M]

(OR)

8. Design a deck type welded plate girder to suit the following data. [14M]
Effective span of the girder = 30 m
Dead load (Open Floor) = 7.5kN.m
Equivalent live load for bending moment calculation = 2727 kN
Equivalent total live load for shear calculation = 2927 kN
Top of rail level = 108 m
Side slopes of embankments = 1.5:1
Foundation level = 100.50
Width of abutment = 4 m

UNIT-V

9. Design and draw the reinforcement details of abox culvert for the following data. [14M]
Box Culvert section = 4×4 m
Unit Weight of soil = 18 kN/m^3
Angle of repose of soil = 30°
Road Width = 7.5 m
Foot path on either side = 1m wide.
Filling load = 14 kN/m
IRC class AA (Tracked Vehicle).

(OR)

10. a) Outline Procedures and methods for inspection of bridges. [7M]
b) Explain about Maintenance of bearings in bridges. [7M]
