Code No: **R194101A** **R19** **Set No. 1**

IV B.Tech I Semester Advance Supplementary Examinations, March – 2023

BRIDGE ENGINEERING

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT I

1 a) Distinguish between tracked and wheeled vehicles specified in the IRC codes. [7]

b) What type of loads you would recommend for the design of railway bridges? Discuss briefly. [8]

(OR)

2 a) Discuss briefly on the types of foundations of a bridge. [7]

b) What is the role of well foundation in bridges and explain what is grip length. [8]

UNIT II

3 a) Discuss on the different types of RCC bridges giving main features of each type. [7]

b) Draw a typical cross-section of a slab bridge showing kerbs, railing and appropriate railing of slab. [8]

(OR)

4 a) Mention the structural differences between the bridges with slabs supported on two edges and cantilever slabs. [7]

b) Explain Guyon's – Massonet Method in the design of slab bridges. [8]

UNIT III

5 a) What are the load distribution theories used in girders of Tee beam bridge. Explain Courbon's theory. [7]

b) Design the longitudinal girder of a T-beam bridge for the following:
Effective span 18m, Carriage way width 7.5m, Kerb 600 mm on either side. Provide three longitudinal beams and five cross beams. Loading IRC class AA tracked vehicle. Adopt M30 grade concrete and Fe500 steel.
Sketch the reinforcement details.
Use Courbon's method for the calculation of reaction coefficients. [8]

(OR)

6 a) Discuss on the various elements present in a Tee beam bridge. [7]
b) Explain the step wise procedure to design an intermediate longitudinal girder of a Tee beam bridge. [8]

UNIT IV

7 a) List the various types of stiffeners used in plate girders and explain their structural functions. [7]
b) What is the advantage of using unstiffened webs in plate girders? Explain how to design an unstiffened plate girder. [8]

(OR)

8 a) Discuss on the various components of a plate girder using a sketch. [7]
b) Explain the function of lateral bracings and cross frames used in plate girder bridges. How do you design them in a typical plate girder. [8]

UNIT V

9 a) Explain the general features of substructure of a bridge with the help of a sketch showing elevation of a typical bridge structure. [7]
b) Discuss on the various forces acting on the piers. [8]

(OR)

10 a) Explain different types of abutments. [7]
b) What is a wing wall and its purpose? Distinguish between Return type and Splayed type wing wall. [8]