



- (b) (i) Describe the factors to be considered while selecting the suitable site for the construction of bridge. (7)
- (ii) Explain how the impact factor is calculated for bridges. (6)
12. (a) (i) Illustrate the load distribution theories used in girders of Tee beam and slab bridge. (6)
- (ii) Explain Courbon's theory. (7)

Or

- (b) Explain the method of designing a slab deck integrated with longitudinal and cross section girder using Pigeauds method to support live loads due to IRC Class AA tracked vehicle.
13. (a) Determine the maximum shear force and bending moment of RCC Tee beam and slab deck using the following data:
- Spacing of the main T beam is 3.2 m
- Span of T beam is 20 m (length of bridge)
- Cross girders are provided at 4 m c/c
- Loading : IRC class A wheeled vehicle.

Or

- (b) Explain the design principles of box culvert bridges with neat sketches.
14. (a) Design a reinforced concrete rocker bearing to transmit a support reaction of 1000 kN. The permissible bearing stress in concrete is 8 MPa. Use M35 grade concrete and Fe415 HYSD bars.

Or

- (b) The foundation of the substructure of a bridge consists of 20 piles to carry a total load of 4000 kN. The piles are spaced at 1.2 m c/c and are driven through soft ground to a hard stratum available at the depth of 10 m. Design the pile foundation using M25 concrete and Fe 415 HYSD bars.
15. (a) Explain design principles of steel truss bridge.

Or

- (b) Discuss in detail about the various steps involved in the design of post tensioned prestressed concrete slab bridge.

PART C — (1 × 15 = 15 marks)

16. (a) An RCC simply supported slab is required for the deck of a road bridge having the data given below :

Width of carriage way	: 9.5 m
Width of kerb	: 700 mm
Clear span	: 8m
Width of bearing	: 400 mm
Type of loading	: IRC class A tracked vehicle
Materials used	: M30 grade concrete and Fe 415 grade steel

Or

- (b) Design an RCC Tee beam girder bridge for the following data:

Clear width of road way	: 7.5 m
Span (Centre to centre of bearing)	: 18 m
Live load	: IRC class AA tracked vehicle
Average thickness of wearing coat	: 90 mm
No. of main girders	: 4
Spacing of cross girders	: 3 m
Materials used	: M30 grade concrete and Fe415 grade steel