



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.TECH(CE)/SEP.SUPPLE/SEM-8/CE-802/2/2012**

**2012**

**BRIDGE ENGINEERING**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A**  
**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Deck slab of bridge is
  - a) always one way                      b) always two way
  - c) one way or two way                d) flat slab.
- ii) Cross girder of the bridge is designed as
  - a) T-beam                                  b) deep beam
  - c) rectangular beam                    d) I-beam.
- iii) Crush barrier is a member provided in bridge
  - a) near bearing
  - b) at top of pier
  - c) at side face of deck slab
  - d) at pier cap.





- xi) The design philosophy recommended by IRC for bridge design is
- working stress method
  - limit state method
  - un-cracked method
  - cracked method.

**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

- Discuss the importance of Hydraulic factors in Bridge Design.
- Illustrate with figure the different components of bridge.
- Discuss the different classes of live loads to be considered in deck slab design of a bridge.
- Discuss the design basis of a cable stayed bridge.
- Write a short note on Balanced cantilever bridge.

**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

- Design a deck slab of bridge considering 70R tracked vehicle and live load. Given clear road way = 7.5 m; Number of T-beam = 3; Spacing of beam = 2.5 m; Effective span = 14.5 m; spacing of cross beam = 3.65 m. Consider M25 grade concrete and Fe415 grade steel.
- Design the cantilever footpath portion of a bridge having a clear overhang of 1600 mm considering live load and most unfavourable vehicular load. Consider M20 and Fe500 combination. Given that width of long girder is 300 mm.



9. Design deck slab of a box culvert over a state highway.  
Given : Width of culvert 12 m; footpath not provided;  
Clear span = 5m, height of vent = 3 m; Depth of foundation = 1.35 m; Thickness of wearing course = 50 mm. Consider appropriate live load.
10. Design a longitudinal girder of a bridge of an effective span 15.5 m using 70R live load class. The girder is provided with three cross girders, two at its end and one at mid-span. Thickness of deck slab = 300 mm. Centre to centre distance of girders = 3 m. Assume all other relevant data required.
11. Design a steel longitudinal girder for a steel concrete composite construction. Thickness of RCC deck slab = 250 mm; effective span = 12.25 m. Centre to centre distance of girders = 2.5 m. Consider appropriate live load.

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