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10CV766

**Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018**  
**Design and Drawing of Bridges**

Time: 4 hrs.

Max. Marks:100

**Note: 1. Answer any TWO full questions form PART A and ONE question from PART B**  
**2. Use of IS456-2000, IS 800 and steel tables permitted.**

**PART – A**

- 1 a. With the help of a neat sketch, name the parts of a Bridge. (10 Marks)  
b. List the types of abutments with a neat sketch. (10 Marks)
- 2 a. Briefly describe the investigations to be carried out in selection of an Ideal Bridge site. (10 Marks)  
b. Define linear water way and Afflux. State their importance in designing a Bridge. (10 Marks)
- 3 Design a RCC slab culvert for IRC class AA tracked vehicle for a road width of 7.5m having 1.0m footpath an either side. The thickness of wearing coat is 80mm. clear span of the culvert is 6.0m. Thickness of Kerb is 200mm. Bearing an either side is 500mm. Materials used are M<sub>25</sub> concrete and Fe415 steel. Draw cross section of the slab, showing details of Reinforcement. (20 Marks)

**PART – B**

- 4 a. Design the longitudinal girder of a T-beam bridge having a span of 18.0m for IRC class AA-tracked vehicle.  
Thickness of deck slab = 240mm  
Thickness of wearing coat = 80mm  
Width of the rib = 400mm  
Longitudinal girder = 3 number at 3m C/C  
Cross girder = 5 number at 3 m C/C  
Adopt Courbon's method to analyse the girder. Materials available, M<sub>20</sub> concrete and Fe 415 grade steel. Draw the cross section of girder. (30 Marks)
- b. Design the interior panel of a T-beam bridge for the following data. Check for shear and provide Reinforcement pattern in the slab.  
Slab – 16m (effective) ; Road – two lane ;  
Foot path – 600mm on either side ; Materials – M<sub>25</sub> Concrete and Fe415 steel ;  
loading IRC class AA – tracked  
Number of longitudinal girders – 3 at 2.8m C/C spacing cross girders are placed at 4m C/C. (30 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



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- 5 Design a composite bridge deck consisting of a RCC slab on steel girder. The span of the bridge is 15m. The other details are :
- Road – Two lane Highway
  - Kerbs – 600mm on either side
  - Number of steel girders – 4 at 2.5m C/C spacing
  - Materials – M<sub>25</sub> concrete, Fe415 Steel
  - Bed level – 150m ;
  - Bed width – 21m ;
    - Stream bund top = 152.50m
    - Road top level = 155.20m
    - Hard rock level = 148.50m
  - Wing walls – Return type  
(shear connectors not required)
- Draw : Cross section of the deck slab for a suitable scale.

(60 Marks)

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