BICEE-010

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

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December, 2017

BICEE-010 : ANALYSIS AND DESIGN OF BRIDGES

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Relevant IRC and IS*
codes are permitted. All questions carry equal
marks.

1. Design a reinforced concrete box culvert having a
   clear ventway of 3 m by 3 m. The superimposed
   dead load on the culvert is 12·8 kN/m². The live
   load on the culvert is 50 kN/m². Density of soil at
   site is 18 kN/m³. Angle of repose = 30°. Adopt
   M 20 grade concrete and Fe 415 grade tor steel.   *14*

2. (a) What are the characteristics of an ideal site for a bridge across a river ? 7

    (b) Discuss briefly the economical span of a bridge. 7

3. Design a R.C.C. Tee beam and slab deck with the following data :

    Effective span of girders = 16 m

    Clear width of roadway = 7·5 m

    Width of kerb = 600 mm

    Thickness of wearing coat = 80 mm

    Number of main girders = 4

    Spacing of main girders = 2·5 m

    Spacing of cross girders = 4 m

    Type of loading IRC class 70 R tracked vehicle.

    Use M 20 and Fe 415.

    Design/check the deck slab and exterior girders for flexure only. 14

4. (a) List different types of bearings and discuss elastomeric bearing in detail with neat sketches. 10

    (b) What are the factors influencing the choice of the bridge type ? 4

5. (a) What are the design principles of plate girders ? 7

(b) What are the advantages of prestressed concrete bridges ? Describe the types of prestressed concrete bridges. 7

6. Write short notes on the following : *2×7=14*

(a) Courbon's Method

(b) IRC Loadings on Bridges

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