23525

M.Tech 3rd Semester Civil Engg. Specialisation in Structural Design Examination,

December–2017

DESIGN OF BRIDGES

Paper-MTSD-308

Elective-III

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt any* ***five*** *questions. Assume any data if missing.*

1. Explain why selection of bridge site is important and how investigation report effects the selection of bridge type. 20

2. The following data pertains to a deck slab bridge : 20
   Clear distance between abutments : 6.7 m
   Road: National Highway (two lane)
   Footpath: 1.5 m on either side.
   Wearing Coat:50 mm (average)
   Loading: IRC Class AA (tracked)
   Material: M40 concrete, Fe 415 grade steel.

3. Design a double cantilever bridge to suit the following data : 20
   Total length of the bridge = 55 m

Road width = 7.5 m (Two lane)

No Footpaths is provided

Spacing of beams = 1.75 m

Loading : IRC class AA tracked vehicle

Material : M-35grade of concrete and Fe 415 grade of steel

4. What are the different types of Box Girder Bridges ? Explain and draw neat and clean sketches for all. 20

5. Design a prestressed concrete slab for the following data : 20

Span (clear) : 5.0 m

Live Load : IRC class AA

Road : National Highway

Foot Path :1m on either side

Material: M 35 concrete and Fe 500 grade of steel.

The compressive stress permissible in concrete during transfer : 20Mpa.

6. Explain the following in detail : 20

(a) Short term deflections.

(b) What are the checks for stresses at various sections ?

(c) Long term deflections.

7. Design of Pier for following data : 20

Preliminary Dimension : Assumed as in Fig.

Super-Structure: Simply Supported T-beam of 21.3m span

Foundation: Well Foundation

Dead Load from each span: 2400 kN

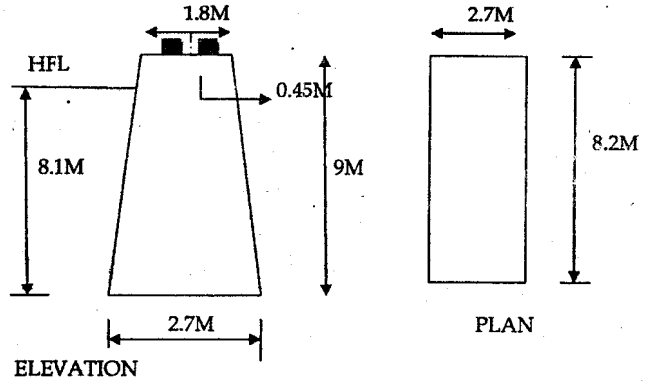
Reaction due to L.L on one Span:1000 kN

Maximum velocity of current: 3.5 m/ sec

Material for pier:Cement Conc. M40 grade

L.L: IRC class AA

Only the straight portion of the pier will be considered in design.



8. Explain the following in detail : 20

(a) Rocker - Roller bearing.

(b) Elastomeric Pad Bearing.

(c) Reinforced concrete Rocker bearing.