

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

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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-35 grade 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

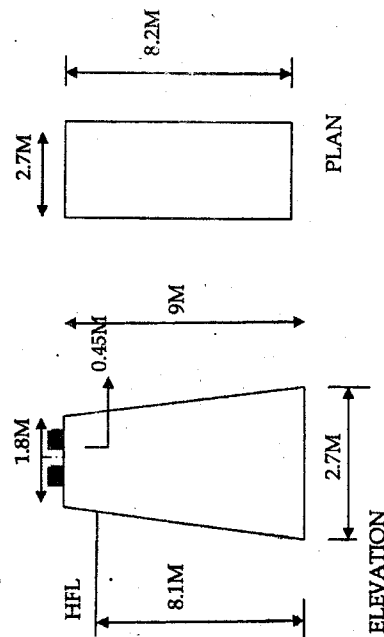
Reaction due to L.L on one Span: 1000 kN

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.