

EC-214

B.E. VIII Sem. Exam.-2013

A.S.D. - II (STEEL)

Paper : CE-802

Time Allowed : Three Hours

Maximum Marks : 60

Note : Answer one question from each unit use of relevant IS codes, IRC publications, Bridge rules and tables as permitted missing data, may be suitably assumed. All questions carry equal marks.

UNIT - I

Q.1. A deck type plate girder bridge for BG loading consists of the following details:

Effective span = 20m

Spacing of plate girder = 1.9m c/c

Weight of stock rails = 440 N/m

Weight of guard rails = 260 N/m

Weight of fastening etc. = 280 N/m

Timber sleepers : 250mm×150mm×2.8m@400mm c/c

Density of timber = 7.4 KN/m³

- Compute the max^m B.M. & S.F.
- Design the central sections of the plate girder.

OR

- Q.2. Design the section of plate girder to carry a superimposed load of 100KN/m on an effective span of 24m. Take impact factor = 0.4. Also design the end bearing stiffener. 12

UNIT - II

- Q.3. A pratt truss girder through bridge is provided for a single broad gauge tract. The effective span of bridge is 40m. The cross girders are spaced 4m apart. The stringers are spaced at 2m weight of rails, fastenings, sleepers etc. is 2KN/m. The main girders are provided at a spacing of 7.0m. The bridge is to carry standard main line loading. Design the member U₅U₆ of top chord. (See fig. 1) 12

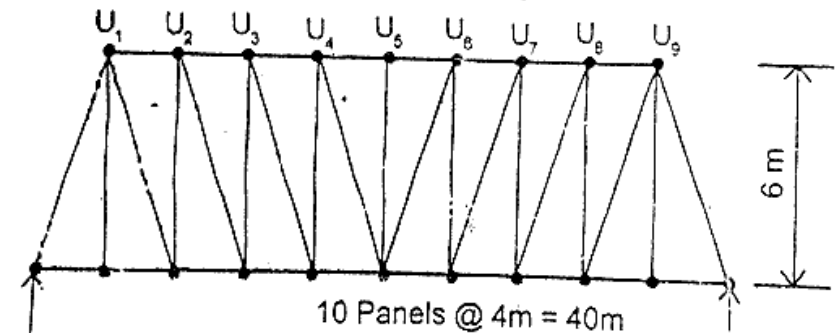


Fig. 1

OR

- Q.4. Following data are given for a foot bridge: 12
- Type of girder = N type truss
 - Span of girder = 18m c/c
 - Spacing of cross girders = 2.5m c/c
 - Live load = 4KN/m²
 - Flooring : Timber planks.
- Design the most critical members of top chord, bottom chord and the diagonal members.

UNIT - III

- Q.5. Design a overhead steel tank having hemispherical bottom for storing 600KL water. 12

OR

- Q.6. Design a pressed steel tank for storing 250KL water. 12

UNIT - IV

- Q.7. Design for Bhopal a self supporting steel stack of height 40m above the foundation and diameter of 3.6m at top. Assume 100mm thick brick lining supported by the stack throughout the height. The topography is flat and terrain category 3. 12

OR

- Q.8. What is Guyed steel stacks? Explain the design of Guyed steel stack. 12

UNIT - V

- Q.9. A steel bunker 8m length and 4m width is supported on eight columns (four along each long side) to store coal of bulk density 8KN/m^3 . The angle of internal friction is 35° . Height of vertical portion and hopper are 4.0m each. Determine bursting force at salient levels. Design the plate and stiffener in through portion. 12

OR

- Q.10. A circular steel silo of 12m height and 5m internal diameter stores cement of bulk density 15500 N/m^3 . The angle of internal friction is 25° . The mean size of the particles be assumed to be less than 60μ . Determine the horizontal and vertical pressure at 6m and 10m depth from top. Also design wall plates. 12