

Seat No. : \_\_\_\_\_

**NK-123**

**November-2013**

**Third Year, B.Arch., B.C.T., I.D., Semester V**

**AR – 503 : Structure – V – (Regular)**

**Time : 3 Hours]**

**[Max. Marks : 50**

- Instructions :**
- (1) Only scientific calculator is permitted.
  - (2) IS – 800-2007 and steel table are permitted.
  - (3) Assume suitable data if required.

1. Any **five :** **10**
  - (1) Explain pitch, gauge line and edge distance in riveted connection.
  - (2) Draw neat sketch of different connection of column with base plate for parking shed.
  - (3) What is ISMC, ISA, ISJ, ISLA, ISWC, ISWB ?
  - (4) Write advantages and disadvantages of welded connection.
  - (5) Define and Draw a neat sketch of Castelled beam.
  - (6) Explain Grillage foundation with neat sketch.
  
2.
  - (1) Explain geodesic dome with neat sketch. **3**
  - (2) Draw neat sketch of gantry girder and explain stresses produced in it. **3**
  - (3) Explain advantages and disadvantages of steel as a structural material. **2**
  - (4) Explain Pile and raft foundation with neat sketches and design criteria of it. **2**
  
3.
  - (1) Define compound column and describe lacing and battening with sketch and its design criteria. **3**
  - (2) Design a steel column 4.1 M long section to carry an axial load of 500 kN and effectively held in position at both ends but restrained against rotation at one end only, consider,  $F_y=250 \text{ N/MM}^2$ . **5**
  - (3) Write criteria for effective length consideration according to end support condition **2**

4. (1) A library hall of inside clear dimension is 5M\*18M having 350 mm thick masonry wall, five steel beams to support 150 mm thk. R.C.C. slab. Design steel beam with following data, Floor finish load = 1.0 kN/m<sup>2</sup>, Live load = 6.5.0 kN/m<sup>2</sup>, E=2\*10<sup>5</sup> kN/m<sup>2</sup> **6**
- (2) Explain Virendell truss and its use and design criteria. **2**
- (3) Draw neat sketch of Industrial Shed showing all components. **2**
5. Design plate girder for an effective span of 22.0 m. It is to carry a load of 90 kN/m. Consider Permissible ave. shear stress = 100 MPa, Permissible Bending stress =165 MPa, Permissible Bearing stress = 180 MPa, Assume suitable data if necessary, check important criteria only. **10**
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