

B.Tech. Civil (Construction Management)

Term-End Examination

December, 2013

ET-521(C) : DESIGN DETAILING

Time : 3 hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Candidates are allowed to use IS 456 and IS 800 and calculator. Any missing data may be suitably assumed.

1. A doubly reinforced beam whose size is limited to 300 mm × 600mm (overall) is reinforced with 8-25 ϕ bars in tension and 4-25 ϕ bars in compression. Clear span of the beam is 6m. M15 mix and Fe250 grade steel has been used in the design of above beam. The effective cover to the reinforcement is 30mm. Draw the plan and section of the above beam showing the reinforcement details. 14
2. A circular column of 500mm diameter has a clear length of 5m. The column is reinforced with 8 longitudinal bars of 20mm diameter and spiral of 10mm diameter rod wound around the 20mm bars at a pitch of 60mm. The clear cover for the main reinforcement is 40mm. M15 mix and Fe-250 grade steel have been used in the design of above column. Draw a neat dimensioned sketch showing the longitudinal and transverse reinforcements with details of their spacing. 14

3. Draw the plan and section of a square foundation of size $2.4\text{m} \times 2.4\text{m}$. The overall depth of the foundation is 360mm. 30 Nos. 12mm diameter bars have been provided in both the directions as reinforcement. The column is 500mm square and is provided at the centre. Dowels are also provided. 14
4. Detail a compound steel column consisting of two IS-channels ISMC 200 (2 Nos.) joined by single lacings by means of flats $75\text{mm} \times 8\text{mm}$ at 1.5m spacing. The connections are riveted connections and the effective length of column is 4.50m. 14
5. (a) Draw a neat sketch showing a bolted connection of beam ISMB350 to another ISMB500 going in perpendicular direction. 7
 (b) Draw a neat sketch showing the layout details of a typical factory building. 7
6. (a) Describe various precautions required to be taken while locating an earth station. 7
 (b) Explain various types of sub-stations. Also state various factors that are to be considered while deciding an indoor sub-station. 7
7. (a) Explain various sources of heat gain in a building. How are they quantitatively estimated ? 7
 (b) Name various types of air filters and explain any one of them briefly. 7
8. Write short notes on *any two* of the following :
 (a) Detailing of form work and staging 2x7=14
 (b) Detailing of RC slabs
 (c) Detailing of overhead water tank
 (d) Diversity factor.