

**B.Tech. Civil (Construction Management)**

**Term-End Examination**

**December, 2011**

**ET-521(C) : DESIGN DETAILING**

*Time : 3 hours*

*Maximum Marks : 70*

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

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1. A single reinforced beam whose size is 14 200 mm × 500 mm overall is reinforced with 3 - 22  $\phi$  bars in tension. The effective span of the beam is 4 m. M 20 mix and Fe 250 grade steel has been used in the design of above beam. Draw the plan and section of the above beam showing the reinforcement details.

2. A reinforced concrete column 4 m high (effective) and 400 mm in diameter is reinforced with 8 bars of 20 mm diameter. The column carries the spiral (helical) reinforcement of 10 mm diameter rod wound around the 20 mm diameter bars at a pitch of 60 mm. The 20 mm diameter longitudinal bars are placed with a clear cover of 40 mm. M 20 mix and Fe 250 grade steel has been used in designing the column. Draw the plan and section of the column showing the longitudinal and transverse reinforcements with details of their spacing. 14
3. (a) Explain the common defects in welds. Give examples of each. 7  
(b) Draw a typical roof truss with monitor for industries installing oven/burner. 7
4. Draw a neat sketch showing the reinforcement details of two pile group with 450 mm diameter reinforced concrete piles supporting a 350 mm diameter reinforced concrete column. 14
5. (a) Draw a neat sketch of a built up column of two I - sections and show typical lacing details. 7  
(b) Draw details of the bearing stiffeners of a solid web plate girder 1600 mm total depth and having 600 mm  $\times$  30 mm flange plates. The connections are riveted. 7

6. (a) Describe the various inputs required to estimate the total electrical power for a building. 7
- (b) Discuss the different types of wiring. 7
7. (a) Explain the need for a compressor in an air conditioning system. 7
- (b) Discuss the different factors influencing the ventilation requirements of a conditioned space. 7
8. Write short notes on the following :  $4 \times 3\frac{1}{2} = 14$
- (a) Lighting Design
- (b) Earthing
- (c) Human comfort
- (d) Refrigeration cycle
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