B.Tech. Civil (Construction Management)

Term-End Examination

December, 2015

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ET-521(C) : DESIGN DETAILING

Time : 3 hours *Maximum Marks : 70*

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

1. Draw the neat plan and section (along the short span) of a simply supported rectangular one-way slab with the following data. Also show the reinforcement details.

   • Slab size 2·5 m × 6 m, simply supported on all the four edges on walls of 250 mm thickness.

   • Main reinforcement = 10 mm bars @ 150 mm c/c spacing

   • Distribution bars = 8 mm bars @ 200 mm c/c spacing

- Main reinforcement is bent up near the supports as per codal provisions.

The slab is cast with M 20 mix and Fe 415 steel. *14*

2. Show the typical details of reinforcement in the sectional elevation of a square isolated footing supporting a column :

Size of the column = 400 × 400 mm

Size of the footing = 1·5 × 1·5 m

Thickness of the footing = 250 mm

Show all types of reinforcements to be provided in the column and footing and label them. *14*

3. (a) Give the typical plan and sectional elevation of a double riveted double-cover butt joint. Take the thickness of the main plates as 12 mm and cover plate as 16 mm. Use 25 mm rivets @ 120 mm pitch. The plates are subjected to axial tensile force. *8*

    (b) Give the typical line diagrams showing eccentric load connections (with rivets), and pure moment connections. *6*

4. (a) Discuss the relative advantages and disadvantages of DC (and AC) equipments used for welding. 8

   (b) Give a neat typical labelled sketch showing the details of adjustable ridger at the ridge line of truss. 6

5. (a) Describe 'star connection' and 'delta connection' with the help of neat diagrams. 8

   (b) Describe the criteria for site-selection in order to provide a good earthing. 6

6. (a) Describe the methods of improvement in Power Factor. 7

   (b) Describe in brief the principle of air-conditioning and draw the block diagram of air-conditioning process. 7

7. (a) Describe 'Ductile detailing'. 4

   (b) Differentiate between any *two* of the following : 2×5=10

      (i) Under-reinforced and Over-reinforced sections

      (ii) Rivets in Single shear and Double shear

      (iii) Dog-legged and Half turn stairs

8. Write short notes on any *four* of the following : $4 \times 3\frac{1}{2} = 14$

   (a) Slip form Shuttering

   (b) Beam to Column Connection

   (c) Solar Gain

   (d) UPS System

   (e) Raft Foundation

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