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ET-521(C)

B.Tech. Civil (Construction Management)

Term-End Examination

00070

June, 2015

ET-521(C) : DESIGN DETAILING

Time : 3 hours *Maximum Marks : 70*

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

1. Draw the neat longitudinal section (along the span) and cross-section (at the mid span) of a simply supported singly reinforced rectangular R.C. beam with the following data (also show the reinforcement details) :

- Effective span = 4 m
- Supports width = 250 mm
- Beam width = 300 mm
- Overall depth = 450 mm
- Effective cover to tension reinforcement = 40 mm

Reinforcement in the tension zone = 4 – 20 Φ

- Shear reinforcement (throughout the span) = 8 mm Φ @ 150 mm c/c in the form of two legged vertical stirrups
- Two bars of 20 mm Φ are bent up near the supports (as per codal provision)
- Beam is provided with two hanger bars of 10 mm Φ at the top. The beam is casted with M-20 mix and Fe-415 steel. *14*

2. Show the typical details of reinforcement in a cantilever retaining wall.

Thickness of cantilever is varying from 150 mm (at top) to 550 mm at the junction of footing with wall.

Height of cantilever retaining wall above the ground level = 4 m.

Depth of foundation = 1·5 m.

Footing consists of 2 m heel slab and 1·5 m toe slab from the faces of wall.

Thickness of footing (both of toe and heel) is varying from 500 mm to 250 mm.

Provide vertical face of wall on filling side. Clearly indicate the type of reinforcement in the cross-section of cantilever wall right from top of the wall to bottom of the foundation. *14*

3. (a) With the help of a neat line diagram, differentiate between single fillet weld and double fillet weld. *7*

Also give a neat sketch of a single fillet weld showing throat thickness, effective throat thickness, leg size, root penetration, etc.

(b) With the help of typical sketches, briefly describe the "non-shielding welding" and "shielded arc welding". *7*

4. (a) Draw a neat sketch of a built-up column of two – I sections with battens. Show the details. *7*

(b) Draw neat sketches showing details of

(i) Rivet in single shear lap joint.

(ii) Rivet in double shear butt joint. *7*

5. (a) Give a neat sketch showing general arrangement of a typical lift installation. *7*

(b) Give a schematic diagram showing working of refrigeration cycle. Briefly explain the function of each unit. *7*

6. (a) Describe UPS with block diagram. *6*

(b) Enumerate the types of wiring and describe the PVC sheathed wiring in detail. *8*

7. (a) Describe the beam to column connection in steel construction. *4*

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

(i) Isolated and Combined footing.

(ii) Mild steel and High tensile steel.

(iii) Eccentric load connection and Pure moment connection.

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

(i) Built-up sections for column members

(ii) Safety in welding

(iii) Torsion reinforcement in two-way slab

(iv) Loads on the formwork

(v) Block diagram of air-conditioning system