6. Write short note on I.S. code recommendation for :

(a) Longitudinal reinforcement

(b) Transverse reinforcement.

Unit IV

7. Design a footing for a column of size 400 mm × 400 mm which carries a load of 800 kN. SBC of soil is 200 kN/m^2. Use M20 concrete and Fe 415 steel. One side of the footing is restricted to 1.5m.

Given : Permissible shear = 0.32 N/mm^2

8. Write short notes on Indian standard code recommendations for design of footings :

(a) Moments and forces

(b) Tensile reinforcement.

2052

B. Arch. EXAMINATION, May 2018

(Sixth Semester)

(Old Scheme) (Re-appear Only)

(ARCH.)

AR306G

STRUCTURAL DESIGN-VI

Time : 3 Hours]　　　[*Maximum Marks : 50*
　　　　　　　　[*Minimum Passing Marks : 20*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks. Make sketches wherever needed. Use of calculator and IS:456-1978 and IS:456-2000 is allowed.

Unit I

1. Design a RC roof slab for a short span 4.0 m and long span 4.8 m to carry a live load of 1.50 kN/sqm, the weight of terracing material is 2.16 kN/sqm. Two long edges of slab are discontinuous where two short edges are continuous. The corners of slab are held down. Use concrete M20 and bars of Fe415. Given m^t for Fe415 is 1.48, $f^{ck} = 20$, $f^y = 415$ N/sq. mm, K^u max. = 2.76.

2. Make a reinforcement detailing for two way simply supported slab of size 3m×4m and thickness 125mm. Cut at least one horizontal and one vertical section through slab and show all necessary details and explain the reinforcement detailing of the same.

Unit II

3. Design a staircase flight for an office type building to suit the following data :

   Height between floors = 4.0 m

   Mid landing is cantilevered out and the width is 1.5 m.

   Tread = 300 mm and rise = 150 mm

   Adopt M20 grade concrete and Fe415 HYSD bars.

   Sketch the details of reinforcements in the stair flight.

4. Make a reinforcement detailing for a straight flight stair of width 1.0 m, waist slab thickness 125 mm. Treads are 250 mm and risers are 150 mm. Take 12 equal risers for height 1.8 m. Draw a longitudinal section through stair and show all necessary details and explain the reinforcement detailing of the same.

Unit III

5. A short braced axially loaded column 300 mm square in section is reinforced with four 25 mm diameter bars. Find the ultimate axial load that the column can carry and the pitch and diameter of the links required. The materials are concrete M20 and bars of Fe415.