Unit IV

7. The Flange of an isolated T beam is 100 mm thick and 1600 mm wide. Its web is 250 mm wide and effective depth of the beam up to the centre of tensile reinforcement is 600 mm. The tensile reinforcement consists of 4 nos. 20 mm dia bars. The beam is simply supported over a span of 7 metres. If the beam is subjected to a bending moment of 150 kN/m, calculate the stress developed in concrete and steel. Take $m = 19$. **10**

8. A reinforced concrete T-beam has flange 1200 mm wide and 125 mm thick. Its rib is 250 mm wide and 600 mm deep. Design the beam having a span of 10 metres. Carrying a distributed load of 40 kN/m. Take M 20 and Fe 415. **10**

2032

B. Arch. EXAMINATION, May 2019

(Fourth Semester)

(Old Scheme) (Re-appear Only)

AR206G

STRUCTURAL DESIGN-IV

Time : 3 *Hours*] [*Maximum Marks :* 50

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. Assume suitable data if not provided. Use of IS 456 is allowed.

Unit I

1. (a) Explain various types of shear reinforcement provided in the beam. **5**

   (b) Write various codal provision for bond and development length. **5**

2. A simply supported reinforced concrete beam 250 mm wide and 600 mm deep up to the center of tensile reinforcement carries a uniformly distributed load of 45 kN/m over a clear span of 6 meter. The beam is reinforced with 4 nos 25 mm dia bars at mid span out of which two bars can be safely bent up at a distance of 1 metre from the support. Design suitable shear reinforcement for beam. Take M 20 and Fe 415. **10**

Unit II

3. A rectangular beam is subjected to following moments/forces at a section :

   (a) Bending Movement = 36 kNm

   (b) Shear Force = 26 kN

   (c) Torsional moments = 17 kNm

   Design the section taking M 25 and Fe 415. **10**

4. Design a lintel beam continuously over four window opening each 2.5 metre wide and separated by 230 mm × 230 mm pillars. The beam is subjected to fixed imposed load of 14 kN/m on account of dead weight due to brick work and roof and live load of 3 kN/m. Use M 20 and Fe 415. **10**

Unit III

5. Design a slab for a room 6 m × 5 m, simply supported on wall of 230 mm wide. The live load on slab is taken as 4 kN/m^2 and the floor is finished with 10 mm thick granite flooring. Assuming other data suitable, take M 20 and Fe 415. **10**

6. Write design steps and draw all the view of a two way slab with corner held down condition. **10**