carries a Live load of 2000 N/m^2, and it is finished with 20 mm thick granolithic topping, whose density is 17 KN/m^3. Use M 25 and Fe 415. Draw Section along long span, short span, top and bottom of the reinforcement. **7**

Unit IV

7. Design a combined footing for two columns located at a center to center distance of 4 metres. First columns is 350 mm * 350 mm in size and carries a load of 650 kN. Second column is 450 mm * 450 mm in size and carries a load of 800 kN. The safe bearing capacity of soil is 160 kN/m^2. Use M 25 and Fe 415. **10**

8. Design a RCC footing for a 300 mm thick brick wall carrying a load of 120 kN per metre length of the wall. The Safe bearing capacity of soil is 110 kN/m^2. Use M 25 and Fe 415. **10**

D-4002

B. Arch. EXAMINATION, May 2017

(Fourth Semester)

(B. Scheme) (Main & Re-appear)

STRUCTURAL DESIGN-IV

AR-206B

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. All design should be supplemented by relevant drawing. Use M 25 and Fe 415 if not provided. Assume suitable data if not provided. Use of IS code IS-456 is allowed.

Unit I

1. (a) State various assumptions used in Limit State method of Design. **5**

(b) What are Partial Factor of Safety ? Define Partial factor of safety for materials and loads. **5**

2. (a) What are the various Limit States ? **5**

(b) Draw strain stress diagram for Steel and Concrete. **5**

Unit II

3. A rectangular beam subjected to following moments/forces : **10**

(i) Bending Moments = 36 kNm

(ii) Shear Force = 26 kN

(iii) Torsional moments = 17 kNm

Design the section taking M 25 and Fe 415.

4. The Flange of an isolated T beam is 100 mm thick and 1600 mm wide. Its web is 250 mm wide and the effective depth of the beam up to the center of tensile reinforcement is 600 mm. The tensile reinforcement consists of 4 no. 20 mm dia. bars. The beam is simply supported over a span of 7 metres. If the beam section is subjected to a bending moment of 150 kNm. Calculate the stress develop in steel and concrete. Take M 30 and Fe 415. **10**

Unit III

5. Design a Reinforced concrete Slab measuring 5m × 6m in size. There is simply supported on all the four edges with corner held down, and carries a superimposed load of 3500 N/m^2. The floor carries a floor finish which weight 15 kN/m^3. Use M 25 and Fe 415. Draw Section along long span, Short Span, Top and Bottom of the Reinforcement. **10**

6. (a) Write difference between one-way and two-way slab. **3**

(b) Design a reinforced concrete slab measuring 3 m * 8 m in size. The slab