

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,  
LONERE – RAIGAD - 402 103  
Summer Semester Examination – June - 2022**

**Branch: Civil Engineering**

**Sem.:- VI**

**Subject with Subject Code:- Design of Concrete Structures I (BTCVC601)**

**Marks: 60**

**Date:- 11/08/2022**

**Time:- 3 Hr. 45 Min**

**Instructions to the Students**

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly
5. Use IS: 456-2000 is allowed

- (Marks)**
- Q.1. Solve the following**
- a) Enlist different assumption for design of member in working stress Method. **(04)**
- b) Find maximum compressive stress in concrete and tensile stress in steel in a doubly reinforced section for the following data. Width of beam=300 mm, Effective depth of beam=500 mm , Effective Cover= 25 mm Moment= 120 KNm. Area of steel in tension= 4 bars of 20 mm diameter. Area of steel in compression= 4 bars of 20 mm diameter. Modular Ratio (m)=13.33. Using Working Stress Method (WSM). **(08)**
- Q.2. Solve the following**
- a) What's are different load acting on R C structures? **(04)**
- b) Design one way simply supported slab for the following data. **(08)**  
Effective Span =4 m  
Live Load= 3 KN/m<sup>2</sup>  
Floor Finish= 1 KN/m<sup>2</sup>  
Use M<sub>20</sub> and Fe 250. Using Working Stress Method (WSM).
- Q.3. Solve the following**
- a) A circular column having diameter 500 mm is reinforced with 8 bars of 16 mm diameter. The column is 8 m long and is effectively held in position at both ends but not restrained against rotation. Find load carrying capacity of column. Use M<sub>20</sub> & Fe 415. Using Working Stress Method (WSM). **(04)**
- b) Design an isolated footing of uniform thickness of a R.C. column carrying a load of 1650 KN and having size 450 mm X 450 mm. The safe bearing capacity of soil may be takes as 250 KN/m<sup>2</sup>. Use **(08)**

M<sub>25</sub> and Fe 415.

Using Working Stress Method (WSM).

**Q.4. Solve the following**

- a) Explain limit state method (04)
- b) Design under reinforced section to resist factored BM of 125 KNm having width 250 mm using M<sub>20</sub> and Fe 250 using Limit state Method (LSM). (08)

**Q.5. Solve the following**

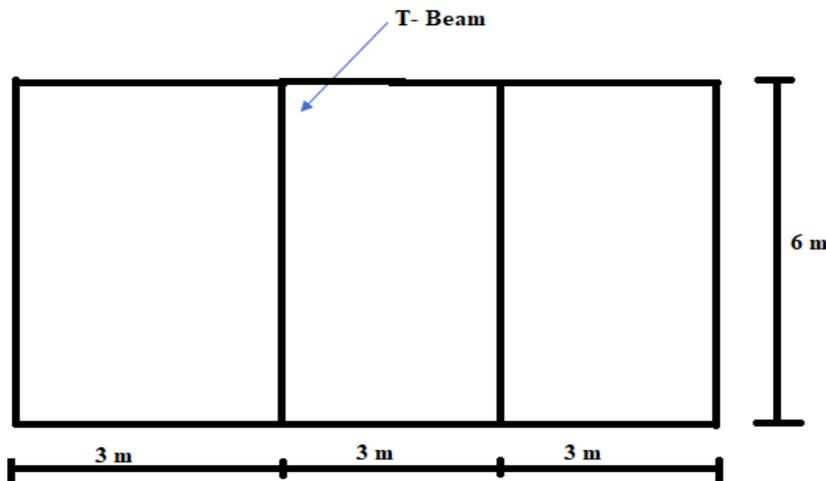
- a) Draw and explain stress strain diagram for singly reinforced rectangular section (04)

Design intermediate beam (T- Beam) for the slab beam system given below (Figure 1) by IS Code method (Limit State Method) using M<sub>15</sub> and Fe 415. (08)

$$\text{Udl on slab} = 5 \text{ KN/m}^2$$

$$\text{Floor Finish} = 1 \text{ KN/m}^2$$

Slab Thickness = 100 mm



**Figure 1**

**Q.6. Solve the following**

- a) Explain different type of Shear Reinforcement in beam (04)
- b) A simply supported beam is 250 mm X 500 mm overall having 2 bars of 20 mm diameter going into the support if the working shear force at the support is 135 KN as working load. Find the anchorage length, the clear cover is 25 mm. Use M<sub>20</sub> and Fe 415. Using Limit state Method (LSM). (08)

\*\*\*\*\*End\*\*\*\*\*