

9. Design a retaining wall to retain water on one side or soil on the other side of 3 m height. The soil characteristics are given below : 20

Unit weight of soil : 16 kN/m^2

Angle of repose of soil 30°

The bearing capacity of soil = 100 kN/m^2

Use M25 and Fe500 steel.

Roll No.

24197

**B. Tech. 4th Semester (Civil)
Examination – May, 2017**

DESIGN OF CONCRETE STRUCTURES-I

Paper : CE-206-F

Time : Three Hours]

[Maximum Marks : 100

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

Note : Attempt any five questions. All questions carry equal marks. Question No. 1 is compulsory. Students have to attempt five questions in total at least one question from each Section. IS : 456 are allowed. Assume suitable data.

1. Write short notes for the following :

5 × 4 = 20

- (i) Shrinkage and Creep
- (ii) Partial safety factor and factored load

- (iii) Basic assumption for limit state design method
- (iv) Curtailment of reinforcement
- (v) Counterfort retaining wall

SECTION - A

2. (a) What do you understand by design mix and nominal mix of concrete ? 10
- (b) Discuss briefly the important property of concrete. 10
3. (a) What are limitations and shortcomings of the working stress method ? 10
- (b) What is ductility ? Why should it be considered in design ? 10

SECTION - B

4. A beam of 250×500 mm in section is reinforced with 3-12 mm Φ at top and 5-14 mm Φ at the bottom, each at effect cover of 30 mm. Determine the MOR of the beam section. Take permissible stress in concrete and steel as 5.2 N/mm^2 and 126 N/mm^2 and $m = 18$.

20

5. A rectangular R.C. beam in M25 concrete is 200 mm wide and 350 mm deep (overall) and is reinforced with 4 bars 12 mm Φ on tension side. The beam cross section is subjected to a maximum bending moment of 25 kNm and a maximum shear force of 30 kN. In addition the beam cross section is subjected to a Torsional of 30 kNm. Calculate the reinforcement for torsion. 20

SECTION - C

6. (a) What is the requirement of good detailing ? What is the minimum requirement of cover for different structural components ? 10
- (b) Discuss briefly cracking of concrete. 10

7. Design a two way slab for a room having clear dimensions of $4000 \text{ mm} \times 5000 \text{ mm}$. Take LL as 2000 N/m^2 and finishes as 500 N/m^2 . Use M15 mix and mild steel bar as reinforcement. Assume suitable data. 20

SECTION - D

8. Design a R.C. footing under a masonry wall 350 mm thick carrying an axial load of 160 kN/m . The bearing capacity of the soil may be taken as 110 kN/m^2 . Use M20 and Fe415. 20