

Bachelor of Civil Engineering Examination , 2018
(BCE-3rd year –Evening- 1st semester)

Design of Structures I

Time: 3 hours

Full marks : 100

The figures in the margin indicate full marks

Part- I (50 marks)

Assume reasonable value of any data if required

IS 456 and SP16 are allowed in the examination hall

Answer any two questions

15+10=25

- 1(a) Design a short RCC column against an axial compressive force of $P=2500$ KN and biaxial moments $M_x=250$ KN-m and $M_y= 150$ KN-m. Grade of concrete M25. Grade of steel Fe 415. Apply 'Limit State Method' of design as per IS 456. Partial safety factor against load and moments may be considered 1.5.

- (b) Design a simply supported RCC beam of span 6m against an udl of 30KN/m. Grade of concrete M20. Grade of steel Fe 415. Apply 'Limit State Method' of design as per IS 456. Partial safety factor against load and moments may be considered 1.5.

25

2. Design a RCC slab panel of dimension 4m x 5.2 m against a live load of 3 KN/m². Two adjacent edges of the slab panel is discontinuous and remaining two edges are continuous. Check short and long term deflection. Grade of concrete M20. Grade of steel Fe 415. Apply 'Limit State Method' of design as per IS 456.

25

3. Design a short column with a suitable Isolated square footing against an axial compressive force $P=1500$ KN. Safe bearing capacity of soil =150KN/m². Partial safety factor against load may be considered 1.5.

BE CIVIL ENGINEERING (Part Time)
THIRD YEAR, 1ST SEMESTER 2018
DESIGN OF CONCRETE STRUCTURES-I

Time : 3 hours

Full Marks : 100

PART-II (50marks)

(use separate answer script for each part)

The figures in the margin indicate full marks

Assume reasonable value of any data if required.

IS code No. 456 & SP 16 are allowed in examination hall

Answer any two question

25

1. Design a continuous beam of four equal spans of 6 m each which carries an uniformly distributed dead load (including self weight) 25 KN/M and uniformly distributed live load 10 KN/M. Consider grade of concrete M20 and grade of steel Fe415. Width of beam to be considered as 250mm. IS code coefficient for bending moment and shear force to be used. Apply 'Limit State Method' as per IS 456
 Draw detail arrangement of reinforcements.

25

2. Design a Dog legged stair with following data:

- Stair hall size : 2.2m x 4.7m
- Width of landing : 1m
- Floor to floor height : 3.3m
- Riser : 150mm
- Tread : 270mm
- Floor finish : 1 KN/Sqm
- Consider grade of concrete M20 and grade of steel Fe415
- Apply 'Limit State Method' as per IS 456
- Draw detail arrangement of reinforcements.

25

3. Calculate the area of tension reinforcement required for an L beam of flanged width 1000mm, flange thickness 120mm, width of rib 250mm, total depth 750mm and effective cover 50mm to cater an ultimate bending moment of 750KN-m.
 Apply 'Limit State Method' as per IS 456.

25