Seat No.

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OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Design of Concrete Structures-I

Sub. Code: 67558/83732/84012

Day and Date: Saturday ,13-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Draw neat labelled diagrams wherever necessary**
4. **Figures to the right indicate full marks**
5. **Use of Scientific calculator is allowed**

Special Inst.: **Use of IS 456:2000 is allowed**

Q1) Explain the following, **[12]**

a. Modes of Failure in RC Beams. **[6]**

b. Compare Working Stress Method with Limit State Method **[6]**

Q2) A beam section 300mm wide and 500mm deep is reinforced with a tension reinforcement of 3000mm2 at an effective cover of 30mm. Determine ultimate moment of resistance of beam section. Use M15 Concrete and Mild Steel Grade-I. **[12]**

OR

A concrete beam having b= 350mm, d = 700mm. Design the beam if it is subjected to superimposed load bending moment of 400kN-m.Use M15 concrete & Fe250 steel. Take dc= 50mm.

Q3) A RC beam 230mm wide 450mm deep is reinforced with 3-16mmΦ of grade Fe415 on tension side with an effective cover of 50mm. Design the vertical shear reinforcement when full tension steel is available for ultimate SF of 80kN. **[11]**

Q4) Design a simply supported one way slab provided over a clear span of 3.37m. It carries a live load of 4kN/m2 and floor finish of 1.5kN/m2. Width of supporting wall is 230mm, Steel grade used is Fe415. Assume moderate environment. Take cover – 30mm. Use M25 grade of concrete. **[12]**

OR

The overall dimensions of dog-legged stair are 4750mm × 2400mm with landing of 1125mm . The landing slab spans in the same direction as the stair and are supported by the walls at the ends. Design the stair slab. Provide M20 grade of concrete and HYSD-Steel bars of grade Fe415. The stair is used inside a residential building.

Q5) Design a circular column for the following particulars, **[12]**

Axial Load- 1000kN
Unsupported Length- 2.75m
Effective length corresponding to principal axes are 2.50m and 2.35m.
Use M15 concrete and Fe 415 grade steel.

Q6) Design an isolated rectangular sloped footing for the column of size 230mm×650mm, reinforced with 6-20mmΦ and carrying an axial load of 1200kN. The bearing capacity of the soil is 300kN/m2. Use concrete grade M20 and steel grade Fe415. Effective cover for bottom steel is 60mm. take offset from the face of the column equal to 50mm. **[11]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (84012) Design of Concrete Structures-I Part 4 SEM 7
2] (1154) B.Tech. CBCS (83732) Design of Concrete Structures-I Part 4 SEM 7
3] (101) Bachelor of Engineering (67558) Design of Concrete Structures-I Part 4 SEM 7