Seat No.

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MAR_APR 2026 SUMMER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Design of Concrete Structures-II

Sub. Code: 67748/84745/84930

Day and Date: Saturday ,23-05-2026 **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 IS 456:2000, IS 3370, IS 1346:2012 is allowed.**

Q1) Design the beam for following data, **[12]**
Bending Moment=42KN.m
Shear force=30KN
Twisting moment=12KN.m
Assume width of beam 300mm, Design the beam for torsion effect.
Use Partial safety factor of 1.5
Use M20 and Fe 415 Grades of materials.

Q2) A continuous RCC beam with simple support has two spans each of 6m. The beam supports dead load from brick wall equal to 10kN/m and a live load of 15kN/m. Design the critical section of the beam using LSM and sketch the reinforcement details. Adopt M20 grade concrete and Fe415 grade steel. **[12]**

Q3) Design a circular water tank with flexible base for a capacity of 400 m3. The depth of water is to be 4m including a free board of 200mm, Use M20 grade concrete and mild steel grade-I **[11]**

OR

Design a circular water tank to hold 780 m3 of water. The depth of water in tank is to be restricted to 4.8m and the joint between floor and wall of the tank is to be rigid. Adopt IS Code method of design.Use M20 grade concrete and mild steel grade-I

Q4) A prestressed concrete beam 400mm x 600mm in section has a span of 6m and is subjected to a uniformly distributed load of 16kN/m including the self weight of the beam. The prestressing tendons are located at the lower third point and provide an effective prestressing force of 960kN. Determine the extreme fibre stresses at the midspan section. **[12]**

OR

Write difference between RCC and Prestressed concrete
Explain need for high strength concrete for prestressing.

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Q5) In a prestressed concrete beam of cross section 250mmx350mm is applied at an eccentricity of 70mm by tendons of 400mm2. Assuming modulus of Elasticity of Steel = 2x105N/mm2 and that of concrete = 0.33x105N/mm2, Slip in anchorage =1.5mm, Creep Coefficient in Concrete(Φ)=1, Shrinkage strain of concrete =0.0002 and relaxation loss in steel =3%. Find the total percentage loss of stress in the tendon. **[12]**

Q6) A rectangular beam of prestressed concrete is required to support a dead load moment of 15x106 N-mm(inclusive of its own weight) and a live load moment of 40x106 N-mm at its mid span-section. Determine the initial prestressing force and its eccentricity at the mid-span section. Take following data, **[11]**
Allowable initial compressive stress = 17 N/mm2
Allowable final compressive stress = 14 N/mm2
Allowable initial or final tensile stress = 1 N/mm2
Ultimate stress in steel = 1500 N/mm2. Assume losses -15%

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 (67748) Design of Concrete Structure II Part 4 SEM 8
2] (1154) B.Tech. CBCS (84745) Design of Concrete Structures-II Part 4 SEM 8
3] (101) Bachelor of Engineering (84930) Design of Concrete Structures-II Part 4 SEM 8

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