

Roll No.

23392

**M.Tech Ist Sem. Civil Engg.
(Specialisation in Structural Design)**

Examination-May, 2015

Pre-Stressed Concrete Design

Paper-MTSD-103

Time : 3 hours

Max. 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 the examination.

Note : Attempt any **five** questions. Assume any data if missing in the question paper. Use of IS 1343 is allowed.

1. (a) What is pressure or thrust line? Explain its significance with sketches. [10]

(b) Explain the terms-Prestress, dead load stress, live load stress and resultant stress. [10]

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(1)

[Turn Over

2. Explain pretensioning system. Explain the difference between Lec-Macall system & Magnel Blaton post tensioning. [20]

3. What is anchorage slip? How do you compute the loss of stress due to anchorage slip? [20]

The Indian standard code IS 1343 specifies different strains for pretensioned & post tensioned members. Explain with reasons.

4. Explain the concept of load balancing in prestressed concrete members. [20]

A rectangular concrete beam 150mm wide by 300mm deep spanning over 8m is prestressed by a straight cable carrying an effective prestressing force of 300kN located at an eccentricity of 25mm. The beam supports a live load of 1.5 kN/ m. Calculate the resultant stress distribution for the central cross section of the beam.

5. List the various factors affecting the deflections of prestressed concrete members. Distinguish clearly between short-term and long-term deflections of prestressed concrete beams. [20]
6. What are the different ways of improving the shear resistance of structural concrete members by prestressing techniques? Distinguish between web shear, flexural shear and flexural shear cracks in concrete beam with sketches. [20]
7. Briefly outline the basic principles underlying the dimensioning of flexural members. How do you select the preliminary dimensions of prestressed concrete sections? [20]
8. What are serviceability limit states? Discuss briefly the IS: 1343 code recommendations regarding serviceability limit states. [20]