

Roll No.

23392

**M.Tech 1st Semester Civil Engg.
(Specialization in Structural
Design) Examination-May, 2014**

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. All questions carry equal marks.

1. Write the meaning of pre-stressed conc. and also explain the disadvantages of pre-stressed conc. Also define the basic assumptions. 20

2. Explain the following basic concepts : . 20

(a) Stress concept

- (b) Strength concept
- (c) Balance load concept

3. Explain in detail :

- (a) Classification of pre-stressing. 10
- (b) Types of pre-stressing. 10

4. Explain the high strength-conc. mixes and also explain the deformation and characteristics of conc. 20

5. Explain the following losses in detail : 20

- (a) Loss due to elastic deformation of conc.
- (b) Loss due to creep of conc.
- (c) Loss due to deformation and slip of anchors.
- (d) Loss due to friction

6. A rectangular conc. beam at cross section $150 \text{ mm} \times 350 \text{ mm}$ is prestressed by a straight cable carrying an effective force of 200 kN at the eccentricity of 50 mm. The beam supports an imposed load/LL at 5 kN/m over the span of 8 m. If the modulus at

rupture at conc is 5 N/mm^2 , evaluate the load factor against cracking assuming self wt at conc. 24 kN/m^3 . 20

7. What are the criteria for limit state design. Also explain the design loads in unit state. 20

8. Explain stress-distribution in end block design with neat and clean diagram. 20
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