Hall Ticket Number:

Code No. : 41025 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (Civil) IV Year I-Semester Supplementary Examinations, May-2019
Pre-Stressed Concrete
(Elective-I)

Time: 3 hours

Max. Marks: 70

*Note: i) Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***
ii) Code book IS 1343-2012 is permitted.

Part-A (10 × 2 = 20 Marks)

1. What is application of pre-stressed concrete over reinforced cement concrete?

2. What is Hoyer's method of pres-stressing?

3. Distinguish between uncracked and cracked section?

4. What is modulus of rupture?

5. Mention the parameter used in design of PSC beam

6. Write the expression for design shear strength of uncracked section.

7. Discuss the cable profile for controlling the defection of long beams in PSC.

8. Define the concordant cable profile?

9. Draw the variation of bursting force in the transmission zone.

10. Write the benefits of indeterminate PSC beams.

Part-B (5 × 10 = 50 Marks)

11.a) Discuss the long line system of pre stressing in PSC. [3]

b) A rectangular section is used as a pre-tensioned PSC beam of width 200mmX450mm overall depth, is pre-stressed by 10#8mm diameter wires, initial stress in the tendon is 1000MPa.location of tendon is 90mm from soffit of the beam at constant eccentricity. Calculate the total loss occurs in the beam. [7]

Take total relaxation of steel is 70MPa,shrinkage strain is 300×10^{-6},creep co-efficient is 1.5 and Ec =31kN/mm^2 and Es =210kN/mm^2

12.a) A rectangular pre-stressing beam of span 15m has a cross section 180mmX300mm over all depth, is subjected to live load of intensity 4kN/m, if concentric prestressing the beam, what should be its magnitude of pres-stressing if at the centre of the beam at soffit is subjected to zero stresses. [5]

b) Distinguish between the propped and unpropped section. Draw the stress distribution across the section in the both the cases. [5]

13.a) What is load balancing technique, how it is useful for cable profile? [3]

b) Determine the cable profile for a simply supported beam of span12m has a cross section 200 X 300 over all depth subjected to total imposed load of intensity 5kN/m, with the prestressing force 1200kN. [7]

14.a) Distinguish between the long term and short term deflection in the PSC beam. [3]

b) Determine the central deflection of the simply supported beam of span 12m has a cross [7]
section 150mm X 350mm over all, subjcted to total imposed load of intensity 5kN/m. the
cross section of the tendon is 12 number of 6mm HTSW wires, which has a yield stress of
1200MPa., with the constant eccentricity of 75mm throughout the beam.

15.a) Draw the cable profile for two equal span of continuous beam, subjected to UDL in PSC. [3]

b) A post-tensioned PSC beam has 150mm wide and 450mm deep, is anchorage by a plate of [7]
width 150mm and 120mm concentrically located at the ends. Compute the maximum tensile
stress and magnitude of bursting tension in the transmission length.

16.a) Discuss the main difference between pre-tensioned and post tensioned PSC beams [3]

b) Write the various losses occurs in the pre-tensioned PSC beam and also for post tensioned [7]
PSC beams

17. Answer any *two* of the following:

a) Write the various steps in the design of the flexure for PSC beam as per IS 1343- [5]
specifications.

b) Calculate the eccentricity at the middle support of a 2 span continuous beam of each 6m, [5]
cross section is 120mm X 300 mm, there is straight cable at constant eccentricity of 75mm,
the pre stressing force is 350kN.

c) Mention the various types of design for end block, and discuss the approach for the design [5]
of end block

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