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Roll No.....

CE-8045

B.E. VIII Semester

Examination, June 2017

Design of Prestressed Concrete Structures

(Elective - II)

Time : Three Hours

Maximum Marks : 70

Note: i) Answer any five questions.
ii) All questions carry equal marks.
iii) Assume missing data, if found missing.
iv) Use of relevant code is permitted.

1. a) Why do we need high strength concrete and steel for prestressed concrete structures?
   b) Explain all type of prestressing losses.

2. a) What are the different methods of prestressing? Discuss with sketches Hoyer's long line system.
   b) Explain in detail the load balancing method and cracking moment.

3. What do you understand by shear, torsional and ultimate shear resistance of a prestressed concrete section? Discuss them in detail.

4. a) Briefly outline the magnet's method of computing the horizontal and transverse stress in end blocks subjected to concentrated force from anchorage.
   b) A pre-tensioned beam is prestressed using 5 mm diameter wires with an initial stress of 80% of the ultimate tensile strength of steel ($f_{pu} = 1600$ N/mm^2, $f_{ck} = 30$ N/mm^2) at transfer. Calculate the transmission length and bond stress at quarter and half the transmission length from the end.

5. a) Discuss code recommendation for rectangular and I-section of flexural member.
   b) What do you understand by concordant cable and tendon profile?

6. a) List the various factors influencing the deflections of prestressed concrete members.
   b) A pretensioned T-section has $b_f = 300$ mm, $t_f = 200$ mm. The rib is 150 mm wide by 350 mm deep d = 500 mm; $A_p = 200$ mm^2; $f_{ck} = 50$ MPa & $f_p = 1600$ MPa. Find the ultimate moment capacity using IS code.

7. a) Discuss load-moment interaction curve for prestressed concrete columns.
   b) What are the various design steps for tension member?

8. Write short notes on any four of the following:
   a) Principles of prestressing
   b) End zone reinforcement
   c) Design of continuous beams
   d) Design of purlin
   e) Design of railway sleepers

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