MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester : VI (New) Term : II Academic Year : 2013-14
Course No. : FS 365 Title : Design of Structures
Credits : 3 (2+1)
Day & Date : Tuesday, 06.05.2014 Time : 09.00 to 12.00 Total Marks : 80

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A"**.
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks and Draw neat diagrams wherever necessary.
4. Make necessary Assumptions.
5. Use of standard formulae wherever necessary.

SECTION "A"

Q1 a) What are the step to be followed while designing the axially loaded tension members?
b) State various types of loads acting on roof trusses.

Q2 a) Enlist the various types of roof trusses and show with neat sketches the major components of roof truss.
b) Write down the steps to be followed for designing axially loaded compression member.

Q3 a) Discuss in brief the properties of concrete.
b) Calculate design constant for the following materials considering the balanced design for singly reinforced section. The materials are grade M 15 concrete and mild steel reinforcement.

Q4 A R.C. beam of rectangular section 230 mm wide and 400 mm deep is reinforced with 4 bars of 12 mm diameter provided with an effective cover of 31mm. Calculate the ultimate moment of resistance of the section and the maximum uniformly distributed super-imposed load this beam can carry if it is simply supported over a span of 3.5 m. The materials used are concrete grade M 20 and steel grade Fe 415.

Q5 Calculate the moment of resistance of a doubly reinforced R.C. beam of rectangular section of size 300 mm x 450 mm deep reinforced with 6-dia 20 mm bars on tension side and 4-dia 20 mm bars on compression side.

Q6 a) What are the reasons for providing minimum shear reinforcement?
b) What do you mean by bond? What are the different types of bonds?

Q7 a) Calculate the area of steel required for a short R.C. column 400 x 450 mm in cross section to carry an axial load of 1160 KN. Assume concrete grade M 20 and steel grade Fe 250.
b) State the functions of transverse reinforcement in the designing of column.

Q8 a) What are the various types of footing?
b) Show the pressure distribution under the footing.

Q9 a) What do you mean by development length? State various factors affecting development length.
b) Show the arrangement of transverse reinforcement in designing of column.

Q10 a) Describe the classification of retaining wall.
b) Discuss in brief about one way and two way slabs.

(P.T.O.)

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