B.Tech Sem – VI (2007 Course) (Civil Engg.) : WINTER - 2018

SBUJECT : STRUCTURAL DESIGN – II

Day : Wednesday **W-2018-2843** Time 10.00 AM TO 02.00 PM

Date : 14/11/2018 Max. Marks : 80

N.B.

1) **Q.1** and **Q.5** are **COMPULSORY.** Out of the remaining attempt any **TWO** questions from each section.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer book.
4) Use of non-programmable calculator is allowed.
5) Draw neat and labeled diagram **WHEREVER** necessary.
6) Use of IS 456-2000 and interaction charts is allowed.

SECTION – I

Q.1 **a)** What are partial safety factors? Why they are called 'partial' ? **(05)**

b) Find the balanced design parameter in LSM for M 25 ,Fe 500. **(05)**

c) What are the conditions under which a beam is designed as a flanged beam? Elaborate with sketch. **(04)**

Q.2 **a)** Compare the three design philosophies of R.C. structures. **(07)**

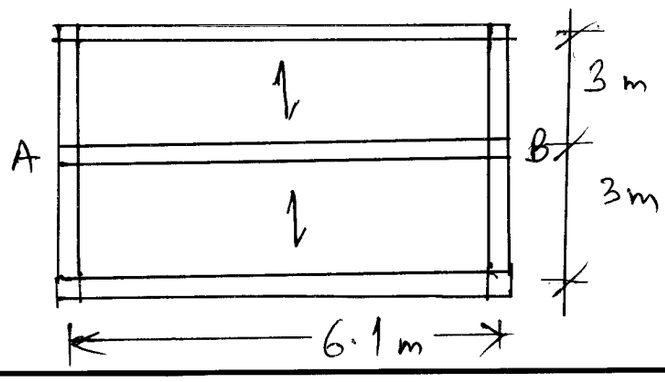
b) What is a creep of concrete? Elaborate with the help of a creep time curve? Define creep coefficient. **(06)**

Q.3 **a)** A singly reinforced concrete beam has a cross section of 230 mm x 450 mm over a simply supported span of 4 m. The beam is reinforced with 3 bars of 16 mm diameter. Dead load on the beam is 2 kN/m exclusive of self weight. Calculate the maximum permissible live load the beam can carry? Use M 20, Fe 415. **(07)**

b) Calculate ultimate moment of resistance of a T-beam for following data: **(06)**
Width of flange = 1100 mm
Depth of slab = 110 mm
Effective depth = 600 mm
Width of web = 230 mm
Area tension steel steel provided = 4# 25.
M 20, Fe 500 is used.

Q.4 **a)** A beam of cross-section 230 mm x 450 mm is subjected to a u.d.l of 40 kN/m exclusive of self-weight on a simply supported span of 4 m. Design the beam completely for flexure and shear. Use M 20, Fe 415. **(07)**

b) Design beam AB as a flanged beam only for flexure .Slab thickness is 125 mm and it is a floor slab of a residential building. The beam also supports a wall of 3 m height. Use M 20 , Fe 415. **(04)**



P.T.O.

SECTION – II

Q.5 **a)** What is the function of distribution steel in slab? How the amount of distribution steel is decided? **(05)**

b) What are interaction charts? How they are used for design of columns? **(05)**

c) What is the difference between one way and two way shear check in footings ? **(04)**

Q.6 Design a three span continuous floor slab for an office building. Each span is 3.4 m. Design the slab using I.S. code coefficient by assuming suitable loading. Use M20 , Fe 415. **(13)**

Q.7 Design a short RC column of effective height 3.8 m. Ultimate axial load on column is 700 kN and ultimate moment about major axis is 20 kN m. Use M 25, Fe 500. **(13)**

Q.8 Design the footing for the above column considering axial load only. Assume safe bearing capacity of soil = 220 kN/m^2. Use M 20, Fe 415. **(13)**

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