CODE NO:- K-32
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (CIVIL) Examination Nov/Dec 2015
Design of Structures - II (RCC)
(Revised)

[Time: Three Hours]   [Max. Marks: 80]

"Please check whether you have got the right question paper."
N.B   i) Q.No.1 and Q.No.6 are compulsory.
                ii) Attempt any two questions from remaining of each section.
                iii) Use IS: 456-2000 is allowed.
                iv) Assume suitable data, if required and state it clearly.

SECTION-A

Q1. A Explain the following terms.
            i) Limit state method and working stress method.   02
            ii) Necessity of using steel in compression region.   02
            iii) Anchorage bond and development length.   02
       B Derive from first principle, the values of design parameters (constants) Kumax, Rumax and ptmax for a   04
            balance section of concrete grade M20 and steel grade Fe 500.

Q.2 A What is redistribution of moments and what are the IS requirements for it.   03
       B A R.C.C beam of rectangular section 230mm×400mm width an effective cover 40mm. find the maximum   12
            imposed uniformly distributed load carrying capacity of beam if it is simply supposed over a span of 3.5m. Use
            M20 and Fe415 grades.

Q.3 A Explain the different types of crack.   03
       B Design a rectangular beam 230mm wide & 600mm deep with an effective span is 5m. The superimposed load 12
            on the beam is 45KN/m. use M20 and Fe415 grades. Assume the effective cove is 50mm.

Q.4 A Write minimum percentage of reinforcement required in beams & slabs for crack control.   03
       B A T beam consists of a flange 1200×110mm. the depth of the beam is 600mm up to the centre of steel and   12
            width of web is 300mm. calculate the ultimate M.R of a T-beam, if area of tensile reinforcement is 2900mm^2.
            Use M20 and Fe500 grades.

Q.5 A Write short term & ling term deflection.   03
       B Design a shear reinforcement for a beam with 230mm wide & 450mm deep(effectively). The beam is   12
            subjected to a shear of 150KN. The grade of concre is M25 & grade of steel is Fe415 & the percentage of steel
            is 1.5.

SECTION-B

Q.6 A Write functions of longitudinal & transverse reinforcement in R.C.C column.   03
       B Explain importance of ductility in seismic design. Also write the names of IS code available related to   04
            earthquake.
       C Explain in detail the Pu-Mu interaction diagram.   03

Q.7   Design a reinforced concrete slab for a room of clear dimensions 4m×5m. The slab is supported on walls of   15
            width 280mm. the slab is carrying a live load 4KN/m^2 & floor finish 0.8Kn/m^2. Use M20 and Fe415 grades. The
            corners of slab are held down.

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Q.8 A Explain the difference between short column & long column.   04

    B Design a short R.C.C column to carry an axial load of 1600KN. It is 4m long effectively held in position &   11
       restrained against rotation at both ends. Use M20 concrete & Fe415 steel.

Q.9   Design a dog-legged staircase with the following data.   15
           i) Size of room =2m×4m
           ii) Column size =230mm×380mm
           iii) Floor to floor height =3m
           iv) Live load =3KN/m^2.
           v) Floor finish=1KN/m^2.
       Use M20 concrete & Fe415 steel.

Q.10   Design an isolated square footing to carry a load of 1100KN from column. The columns having   15
       230mm×450mm. S.B.C of soil is 280KN/m^2. Use M20 grade of concrete & Fe 415 grade of steel. Show the
       detail reinforcements.