| Exam.		Regular	
Level	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Design of RCC Structure *(CE702)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Design codes IS 456, IS 1893, IS 13920 and SP 16 are allowed to use.
✓ Assume suitable data if necessary.

1. a) Explain different types of design methods used in Reinforced concrete structure design. [6]

   b) A column of 4 m length with both ends fixed and effectively held in position is subjected to a design axial load of 1000 KN and factored bending moment of 100 KN-m. Design the rectangular column with its longitudinal and transverse reinforcements. [14]

2. a) A floor consists of 125 mm thick RC slab, integrally connected with the beam as shown in figure below. Design an intermediate beam for BM and deflection if the floor is subjected to live load of 4 KN/m^2 and floor finishes of 0.7 KN/m^2. [10]
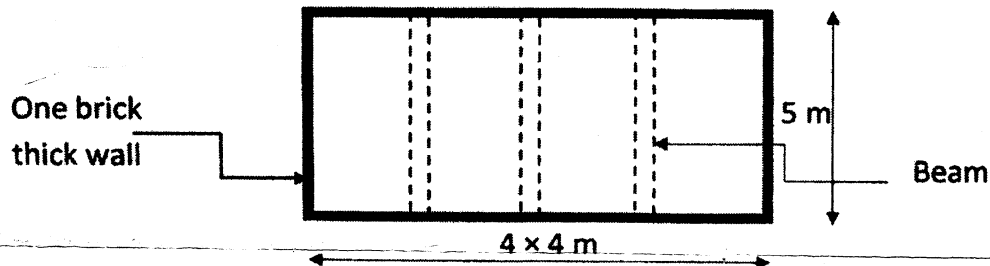
   b) Find the shear resisting capacity of a rectangular beam of 300 mm × 500 mm at the section of bent up bar. Angle of inclination of bent up bar is 45°. Consider M20 and Fe415 grade of concrete and steel. [10]
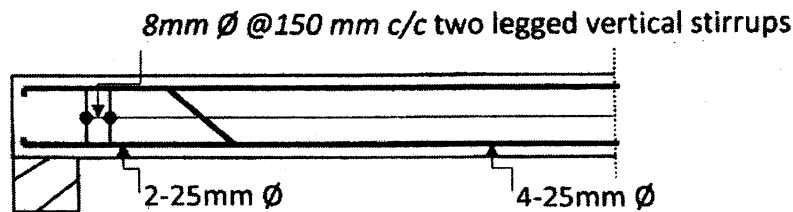
3. a) Explain in details all design steps of R.C.C mat foundation design. [6]

   b) RC slab of the floor of a residential building is subjected to live load of 3 KN/m^2 and floor finishes of 1 KN/m^2. Design the slab panel 2 for BM and SF. Draw neat sketches of slab showing top and bottom arrangements of reinforcing bars. [14]
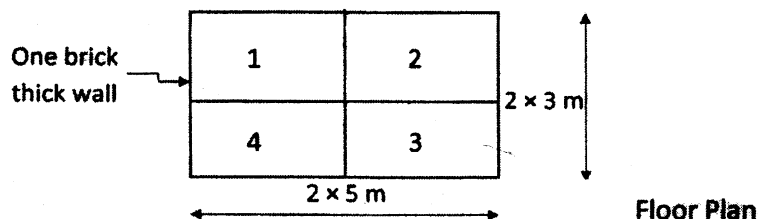
4. a) Design the isolated footing of a column of 350 mm × 500 mm. Column is subjected to design axial load of 2000 KN and design BM of 80 KN-m. Allowable bearing capacity of soil is equal to 175 KN/m^2. [14]

   b) What are the ductility requirement for beam, column and joints of R.C.C structures? [6]

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