CLASS: BE   SEMESTER : V
BRANCH: CIVIL   SESSION : MO/18

SUBJECT: CE5005 STRUCTURAL DESIGN - II

TIME: 3.00 HOURS   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   List four different cements that are in use today.   [2]
Q.1(b)   How does fineness of cement affect the concrete?   [4]
Q.1(c)   Explain workability of concrete. Name and describe any one test to measure the workability.   [6]

Q.2   Design a T-beam to span 8m supporting a one-way slab of thickness 150mm and subjected to a live   [12]
         load of $4kN/m^2$ and a dead load of $1.5kN/m^2$, in addition to its self-weight. Assume Fe415 steel and
         M20 concrete and the c/c of beams as 4m.

Q.3   A rectangular beam of width 300mm and overall depth 600mm is subjected to following service loads: [12]
         bending moment of 100kNm, shear of 80kN and torsion of 40kN-m. Assuming Fe415 steel design the
         reinforcements as per IS456. Assume severe environment condition.

Q.4   The slab of residential building of size 4.3m x 6m is simply supported on all four sides on 230mm walls. [12]
         Assuming factored imposed load of $3kN/m^2$ and load due to finishes of $1.5kN/m^2$, design the floor slab.
         Use Fe415 steel and assume mild exposure.

Q.5   Design a circular column of diameter 400mm with helical reinforcement subjected to a working load   [12]
         of 1200kN. Use M25 concrete and Fe415 steel. The column has unsupported length of 3m and is
         effectively held in position at both ends, but not restrained against rotation

Q.6   Using data of Q.5, design the footing for the column. Safe bearing capacity of soil at a founding depth [12]
         of 1.2m is $200kN/m^2$.

Q.7   Design a dog legged stair for an office building in a room measuring 2.8m x 5.8m clear. Vertical distance [12]
         between the floors is 3.6m. Width of flight is to be 1.25m. Allow a live load of $3kN/m^2$. Sketch the
         details of the reinforcement. Use M20 concrete and Fe415 steel. The stairs is spanning longitudinally
         and landing slabs is supported on sides.

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