CLASS: BARCH   **SEMESTER: V**
BRANCH: ARCH   **SESSION : MO/2018**

SUBJECT : AR5405 CONCRETE STRUCTURES

TIME: 1.5 HOURS   **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1   What is Plain Cement Concrete (PCC) and Reinforced Cement Concrete (RCC)? Why Plain   [5]
        cement concrete is reinforced by steel bars?

Q2   A rectangular beam 230 mm wide and 520 mm effective depth is reinforced with 4 - 16 ϕ [5]
        bars at bottom. Find the depth of natural axis and specify the type beam. The materials
        are M_{20} grade of concrete and Fe 415grade of steel.

Q3   If the beam section in Question 2. is reinforced with 4-20 ϕ bars what will be the depth   [5]
        of natural axis and the type of beam?

Q4   Find the moment of resistance of a beam section 230 mm wide and 460 mm effective   [5]
        depth reinforced with 2-16 ϕ bars as compression steel at an effective cover of 40 mm
        and 4-20 ϕ bars as tension steel. The materials are M_{20} grade of concrete and Fe_{415} grade
        of steel.

Q5   A T-beam of effective flange width 1200 mm, thickness of flange 100 m, width of web   [5]
        300 mm and effective depth of 560 mm is reinforced with 6-28 ϕ bars. Calculate the
        moments of resistance if concrete is of M_{20} grade and steel is of Fe_{415} grade.

Q6   A beam section 230mm X 460mm (effective) is reinforced with 5-16 ϕ bars (Fe415). The   [5]
        factored shear force is 90KN. Check the shear stresses and find the spacing of 6 mm
        diameter - 2 legged vertical stirrups of Fe $_{250}$.

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