Total No. of Questions – [06]

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F. Y. M. TECH. (Civil-Structures) (SEMESTER – II)

COURSE NAME: Advanced Design of Concrete Structures

COURSE CODE: CVPB12201

(PATTERN 2020)

Time: [3 Hours] [Max. Marks: 60]

(*) Instructions to candidates:

1) **All Questions are compulsory**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**
5) **Use of IS456-2000, IS 3370-4(2009), IS 4995-1(1974) allowed**

Q.1 Design a canopy beam and slab over 5m clear opening as shown in Fig Q1 . Take live load on canopy as 900 N/m2, Use M20 & Fe 415 materials. [10]

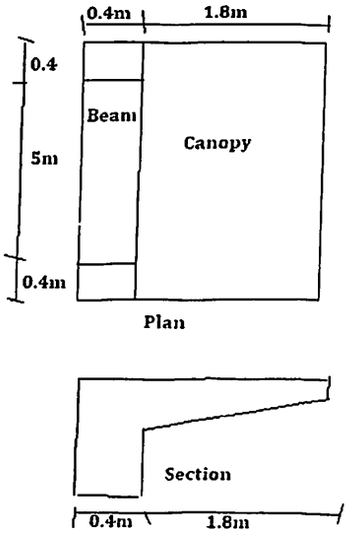

Fig Q1

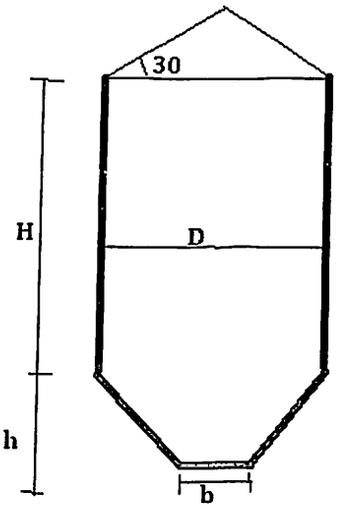

Fig Q6

Q.2 A two span RC beam ABC, such that span AB = BC = 5m. The beam carries a dead load of 20kN/m and uniformly distributed [10]

live load of 25kN/m. Design the beam for flexure, considering redistribution of moment 20%. Assume M20 grade of concrete and Fe415 steel and mild exposure conditions.

Q.3 A flat slab floor system consisting of six panels in each direction supports a dead load of 7 KN/m2 and a live load of 6 KN/m2.. The supporting columns are of 550 mm diameter with a storey height of 3.0m. Design an interior panel of size 5.7 x 6.5 m with column head (drop) provided, using the provisions of IS 456-2000 by direct design method. The materials to be used are M25concrete and HYSD 415grade steel. [10]

Q.4 Design T-shaped retaining wall to retain earth material of 5.5m high with top surface horizontal with surcharge of15KN/m^2.The soil has unit weight of 17KN/m^3 with its angle of repose 28^0.SBC of soil below is 200KN/m^2 and coefficient of friction at the base 0.5. Use M25 concrete and Fe 500 steel. Design should include preliminary dimensions, stability checks, steel for stem and toe slab and stem key if required. [10]

Q.5 A cylindrical tank of capacity 7,00,000 liters is resting on good unyielding ground. The depth of tank is limited to 5m. A free board of 300 mm may be provided. Design the tank with flexible base using M20 concrete and Fe415 grade steel . Draw the following [10]

i) Plan at base ii) Cross section through centre of tank.

Q.6 Design circular bunker of internal diameter 2.4m to store coal as shown in Fig Q6, using M25 grade of concrete and Fe 415 steel for the following data. [10]

Height of wall=3m, h =1.2m, circular opening at bottom b= 0.9m, Surcharge angle 30^0

Also show the detail reinforcement of side wall, hopper and opening.

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