BE sem VII Civil R'19 C'-scheme 02.06.2025

(Time: 4 Hours) (Total Marks: 80)

Instructions:
(1) Question No 1 is **compulsory**.
(2) Attempt any **three full** questions out of the **remaining five.**
(3) Each **full** question carries **20** marks.
(4) Use of all **relevant IS codes** permitted
(5) Assume suitable data, if required and state it clearly

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Q1. Attempt **any four** **20**

(a) Draw and explain ductile detailing in beam.

(b) Differenciate between a rigid base and flexible base in water tanks based on their structurual behaviour.

(c) Write down step by step procedure for design of combined footings.

(d) Explain any three general guidelines for planning the staircase.

(e) Differenciate between static and dynamic loads.Explain different types of dynamic loads.

Q2

(a) A hall in building of clear dimension 14.10m x 9.7m is to be provided a floor consisting of a continuous slab with 300mm wide beam spaced at 3.6mc/c and supported on 300mm wall at ends. The floor is to support a L.L of 3kN/m^2, Partition Load of 1.0kN/m^2 and Floor Finish of 1.0kN/m^2 Design the continuous slab taking M20grade of concrete and Fe 415 Steel.

10

(b)Design cantilever retaining wall and show all stability checks which is supporting a backfill of height 4.8 m earth above ground level. Take SBC and density of 250kN/m^2 and 18kN/m^3 respectively Use M20 and Fe415 steel, $\mu = 0.6$, $\emptyset = 30$deg. **10**

Q3

Design a dog- legged staircase for a building in which the vertical distance between floors is 3.6m. The stair hall measures 3.5m x 5m. The L.L may be taken as 2.0 kN/m^2. Use M20 concrete and Fe415 steel bars.Draw plan and elevation showing reinforcementdetails. **20**

QP code

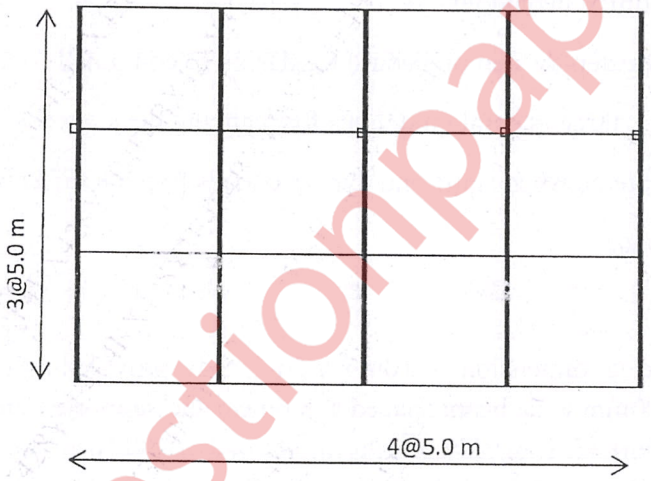
Prog. code
1T00637

Q4

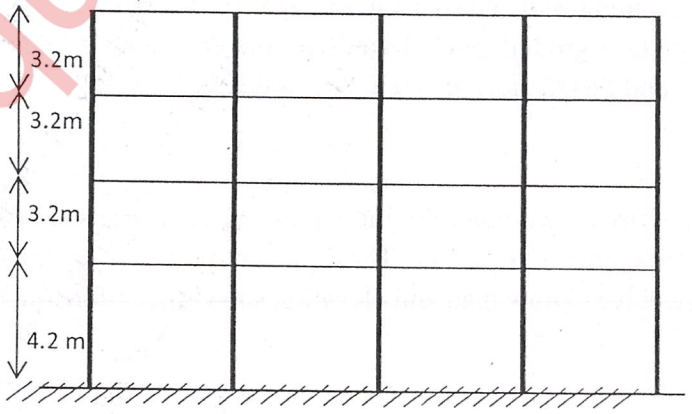
Design a circular water tank resting on ground by approximate method for a capacity of 3 lakh liters. The water tank has flexible base. Use M25 grade of concrete and Fe500 steel. Draw reinforcement detail. **20**

Q5.

a) The building shown in figure is located in Bhopal. The soil conditions are hard and the entire building is supported on a raft foundation. The R. C. frames are infilled with brick-masonry. The lumped weight due to dead loads is 10 kN/m^2 on floors The floors are to cater for a live load of 3 kN/m^{2}on floors. Determine design seismic load on the structure as per IS:1893(Part1)2016. **14**



PLAN



ELEVATION

b) In a post-tensioned beam cable is subjected to a stress of 1000 N/mm^2.If the slip is found to be 3mm.find the percentage loss due to this cause. The beam is 15m long.Take Es=200 kN/mm^2. **06**

Q6. The framing plan of a building is shown below.The design live load is 3 kN/m^2 and floor finish is 1 kN/m^2.All beams carry wall of 150mm thick. Slab thickness is 200mm and floor to floor height is 3.2 m. All columns are of 450mmx450mm.Grade of concrete is M20 and steel is Fe415.

Design beam ABCDE and draw reinforcement details. (Design of slab is not required) **20**