

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC SEMESTER VIII- EXAMINATION – SUMMER 2017

Subject Code: X80602**Date: 01/05/2017****Subject Name: Structural Design - II****Time: 10.30AM to 01.00PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of IS 456:2000, IS 875 (Part I to V), IS 13920, IS 3370 (Part I to IV), SP-34 and SP-16 is allowed.
5. Use M-20 grade concrete and Fe-415 grade steel, if not mentioned.

Q.1 (a) Estimate wind load on any intermediate frame of a multi storey building with following data: **14**
 Plan area = 20m x 20m, Bay width in both direction = 4m, Height of building = 26m, Storey height = 3m, Plinth height = 1m, Height of parapet = 1m, Location of Building - Pune, Terrain Category - 2, Class - B, Design life - 100 years, Ground slope - 1 vertical to 7 horizontal, Hill height = 280m, Location from crest = 100m windward.

Q.2 (a) Draw neat sketch of ductile detailing of 'Beam Reinforcement' as per Indian Standard. **07**

(b) Explain importance with neat sketches of different types of retaining walls. **07**

OR

(b) Explain guidelines for preparation of structural layout of buildings. **07**

Q.3 (a) Fig. 1 shows typical floor plan of G+3 building. Find design axial load on column 'C' of ground floor for the following data: **14**

Slab thickness = 120mm, floor height = 3.0m, parapet height = 1m, floor finish load = 0.75kN/m², live load = 1.5kN/m², thickness of exterior walls = 230mm, thickness of interior walls = 150 mm and beam size = 230mm x 450 mm.

OR

Q.3 (a) Design and detail an isolated footing to support the column load of 1500kN. The size of column is 400mm x 600mm. SBC of soil is 180kN/m³. Use M25 and Fe415. **14**

Q.4 (a) Design and detail the walls of an under-ground rectangular water tank (for tank full condition only) with fixed base using IS3370 for the following data: **14**
 Tank dimensions = 6m x 4m x 4m, Unit weight of soil = 17 kN/m³, Angle of repose of soil = 30°, Use M30 and Fe415.

OR

Q.4 (a) Design and detail (i) Top spherical dome (ii) Top ring beam (iii) Cylindrical wall; of an overhead circular water tank with flat bottom and supported on ring beam having water storage capacity of 3 lac liter. Use M30 and Fe415. **14**

Q.5 (a) A cantilever retaining wall has to retain 4m earth above ground level. Show the stability checks. Design and detail stem slab using following data: **14**
 Unit weight of soil = 18kN/m³, SBC of soil = 170kN/m², Angle of repose of soil = 30°, Coefficient of friction between soil and concrete = 0.60.

OR

- Q.5 (a)** Fix the preliminary dimensions of all components of a counter-fort type retaining wall to retain 7m earth above ground level. Show the stability checks. Design and detail stem slab using following data:
 Unit weight of soil = 18kN/m^3 , SBC of soil = 170kN/m^2 , Angle of repose of soil = 30° , Coefficient of friction between soil and concrete = 0.60. **14**

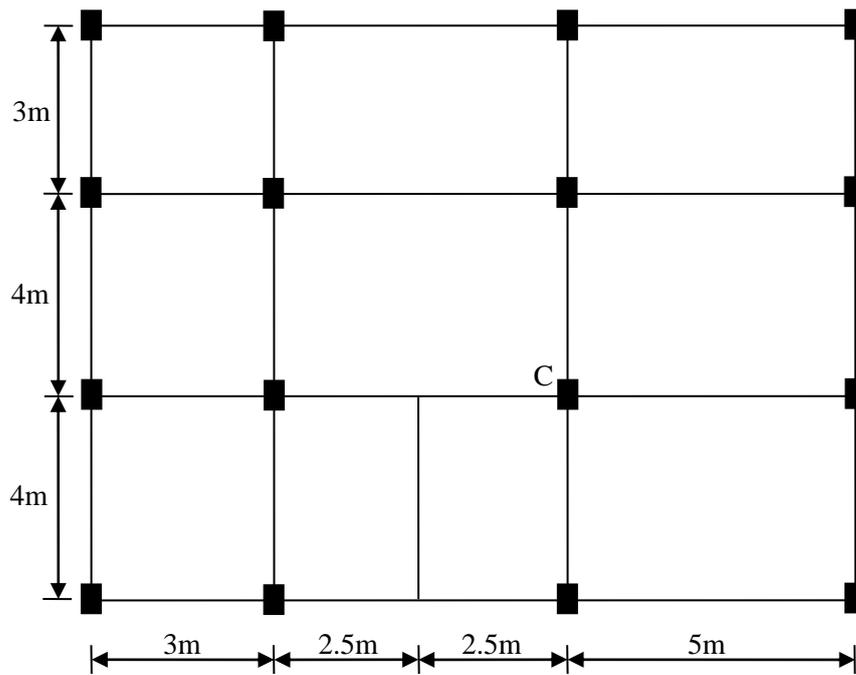


Fig. 1: [Q-3(a)]
