Seat No.:_____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.ARCH - SEMESTER– VI • EXAMINATION – SUMMER 2017

Subject Code: 1065004 **Date: 06/05/2017**

Subject Name: Structure VI

Time: 10.30AM to 12.30PM **Total Marks: 50**

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 3370 and SP-16 is permitted**

Q.1 **(a)** Explain briefly Grillage foundation with neat sketch **05**

(b) Design a combined rectangular footing to fix basic dimensions, for 1000 kN and 1500 kN column loads spaced at 4 m centre to centre. Each column size is 400 mm X 400 mm. SBC of soil is 280 kN /m^2.Use M 20 and Fe – 415 **10**

Q.2 **(a)** Define retaining wall and explain various main components of typical retaining wall with neat sketch **04**

(b) State various types of retaining walls and explain each type of retaining wall with sketch. **05**

(c) Write various forces acting on retaining wall with sketch and describe active earth pressure by Rankine Theory for (i) Dry or moist backfill with no surcharge and (ii) Submerged backfill **05**

(d) Explain the stability condition for cantilever retaining wall with diagram for (i) Stability against overturning (ii) Stability against sliding and (iii) Maximum pressure at base and no tension at base **06**

OR

Q.2 Fix the basic preliminary dimensions of various components including stem of a cantilever retaining wall to retain the earth of height 5.5 m above lower ground level and carry out stability checks except sliding. **20**

Take SBC of soil = 175 kN/m^2

Ø = 30^0, μ = 0.5, Unit weight of soil = 18 kN /m^3.

Use M 20 grade of concrete and Fe-415 grade of steel.

Q.3 (a) Write down the various structural elements of Intze water tank and sketch neat diagram of Intze tank showing economic proportions of structural elements of Intze tank. **05**

(b) Fix the basic dimensions of Intze type container of an elevated water tank to store 6 lacs litre of water and design the top dome. Draw sketch showing the designed details of basic dimensions of Intze tank. Use M 20 and Fe-415 **10**

OR

(a) State and explain with sketch various kinds of joints in water tanks **05**

(b) Sketch neat diagram of circular overhead water tank showing various elements and describe design steps to design (i) Top spherical dome (ii) Top ring beam (iii) Cylindrical wall and (iv) Base slab for tank supported on circular wall and tank supported on ring beam. **10**

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