Reg. No. :

Question Paper Code : 50292

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Sixth Semester
Civil Engineering
CE 6601 – DESIGN OF REINFORCED CONCRETE AND BRICK MASONRY
STRUCTURES
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Use of IS 456 and IS 1905 is permitted.
Use M30 Grade of concrete and Fe 415 Steel Wherever required.
Answer ALL questions.

PART – A   (10×2=20 Marks)

1. What is the function of retaining wall ?

2. What is called surcharge ?

3. What are the forces acting on walls of water tanks.

4. What is a ring beam ?

5. Mention the standard requirement for rise and tread of residential buildings and public building.

6. When do you prefer box culverts ?

7. What are the characteristics of yield line ?

8. What are upper bound and lower bound theorems ?

9. List out the types of bricks masonry walls.

10. What are the permissible stresses to be considered for the design of brick column ?

PART – B **(5×16=80 Marks)**

11. a) Design a T-shaped cantilever retaining wall to retain earth embankment 3m high above ground level. The embankment is surcharged at an angle of 16° to the horizontal. The unit weight of earth is $18kN/m^3$ and its angle of repose 30°. The safe bearing may be taken $100kN/m^2$ at a depth of 1m below the ground. The coefficient of friction concrete and soil may be taken as 0.5. **(16)**

(OR)

b) Design a counterfort retaining wall to retain 7m high embankment above ground level. The foundation is to be taken 1 m deep where the safe bearing capacity of soil may be taken as $180kN/m^2$. The top earth retained is horizontal and soil weighs $18kN/m^3$ with an angle of internal friction is 30°. Coefficient of friction between concrete and soil may be taken as 0.5. **(16)**

12. a) Design an underground tank of size 12m × 5m × 4m depth. The angle of repose of soil 30° and density of soil is $16 kN/m^3$. The soil is saturated. **(16)**

(OR)

b) Design a circular tank flexible base for capacity of 4 lakh litres of water. **(16)**

13. a) Design a dog-legged stair for the following data :
Height of floors = 3.4 m
The size of stair case = 4.3m × 4.3 m
Live load = 2.5 kN/m^2 **(16)**

(OR)

b) Design an interior panel of flat slab 5.6 m × 6.6 m to carry a live load of 7 kN/m^2. Provide two way reinforcement. **(16)**

14. a) Design a simply supported rectangular slab of 4 m × 5 m to carry a load of 5kN/m^2, if the slab is isotropically reinforced using yield line theory. **(16)**

(OR)

b) Calculate the ultimate moment of resistance of a simply supported slab 6m × 4.5 m which is reinforced using 8 mm diameter bars spaced at 100 mm c/c. The thickness of slab is 125 mm. Also calculate ultimate collapse load from first principles. **(16)**

15. a) Design a brick wall to carry a load of 40 kN/m. The height of wall is 3m. Strength of brick is 10 N/mm^2. Use cement mortar ratio 1 : 6. **(16)**

(OR)

b) Determine the allowable axial load on brick masonry column 300 mm × 500 mm constructed using cement mortar of 1 : 6. The height of column is 5 m. strength of brick is 9N/mm^2. **(16)**