



2. Attempt any *two* parts of the following : (10×2=20)

- (a) Design a circular beam supported on 6 symmetrically placed columns. The diameter of the beam is 10 m and the load is 40 kN/m. The coefficient for maximum positive, negative moments and torsion are as follows :

$$M \text{ (negative)} = 0.093 w R^2$$

$$M \text{ (positive)} = 0.047 w R^2$$

$$T = 0.010 w R^2$$

- (b) A square column 450 mm × 450 mm supports an axial load 1600 kN. Design a square footing for a column. The safe bearing capacity of the soil is 250 kN/m<sup>2</sup>. Use M-25 Concrete and Fe-415 Grade Steel.
- (c) A brick masonry wall 230 mm thick carries a load of 370 kN/m inclusive of its own weight. Design the footing of wall. Take bearing capacity of soil as 150 kN/m<sup>2</sup> at 1 m depth. Use M-20 Concrete and Fe-415 Grade Steel.

3. Attempt any *two* parts of the following : (10×2=20)

- (a) Design the stem of a RC cantilever retaining wall, retaining leveled earth 5 m above base level. Take the density of earth as 18 kN/m<sup>3</sup> and angle of repose as 30°. Toe projection 1.8 m, heel projection 1.7 m and thickness of base slab as 450 mm.
- (b) Compute the maximum bending moment for a culvert for the following data :
- Loading = class AA tracked vehicle
- Clear span = 6 m
- Clear width of road way = 7.5 m

Average thickness of wearing coat = 80 mm

The width of bearing = 0.4 m

L'/L	1.0	1.1	1.2	1.3
K for simply supported	2.48	2.60	2.64	2.72

- (c) What are the various components of cantilever retaining wall ? Explain the concept of its design.

4. Attempt any *two* parts of the following : (10×2=20)

- (a) Design the wall of a circular tank of 7 m diameter and 4 m height. The tank is fixed at base and resting on the ground. Sketch the details.
- (b) The inner dimensions of an intze tank are as shown in Fig. 4(a). Design top dome, top ring beam and side wall. Use M-25 Concrete and Fe-415 Grade Steel.

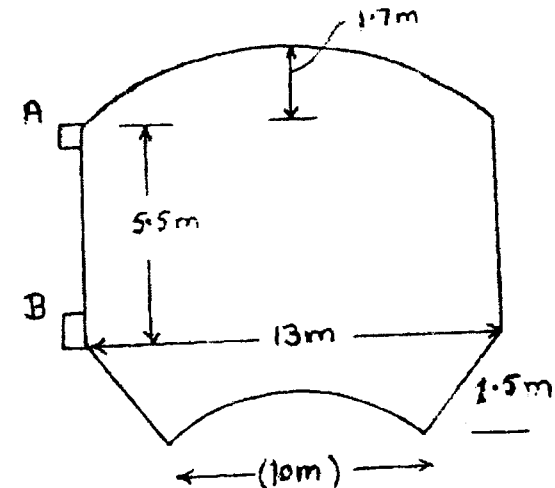


Fig. 4(a)