

Seat No. : _____

TY-102

B.Arch., B.C.T., I.D., Sem.-VI
May-2013

Structures – VI (AR-603)

Time : 2 Hours]

[Max. Marks : 50

- Instructions :** (1) Figures to the right indicate full marks.
(2) Assume suitable data if required.
(3) Use of IS 456 and calculator is permitted.

1. Any **five** : **10**
- (1) Explain C-soil and Φ soil.
 - (2) Define retaining wall and enlist different types of retaining wall.
 - (3) Give critical load conditions considered for design of under ground water tank.
 - (4) Explain difference between retaining wall and box culvert with neat sketch.
 - (5) Enlist various advantages of folded plate over shell.
 - (6) Enlist principal materials used for prestressed concrete.
2. Design a cantilever retaining wall to retain an earth embankment 3.5 m high above ground level. The density of earth is 17 kN/cum, angle of repose is 30° . The embankment is horizontal at top. Consider safe bearing capacity of soil is 200 kN/sqm, coefficient of friction between soil and concrete is 0.50, concrete grade M20 and Fe415 reinforcements. Check for sliding, overturning. **10**
3. Design a circular water tank resting on ground with flexible base for capacity of 2,50,000 liters. Consider $SBC = 180 \text{ kN/m}^2$, $M = 13$, $\sigma_{ct} = 120 \text{ N/sq. cm.}$, $\sigma_{st} = 100 \text{ N/sq. mm.}$, Density of water = 10 kN/cum, concrete grade, M20 and Fe415. **10**

OR



- (i) A prayer hall of size $18\text{ m} \times 18\text{ m}$ have a grid slab with Ribs spacing at 2.00 m c/c in mutually perpendicular direction. Consider live load = 4.00 kN/sq.m. , calculate load per sq. m. **5**
- (ii) A prestress beam $300\text{ mm} \times 500\text{ mm}$ deep has a span of 7.00 m . It is subjected to an UDL of 60 kN/m . Find fiber stress in the beam at mid span and at the end span, if prestressing force is 350 kN applied with an eccentricity of 13 cm below mid depth. Consider total loss in prestressing is 17.0% . **5**
4. (i) Explain structural behaviour of folded plate. **5**
- (ii) Enlist different types of shell with neat sketch and design criteria of it. **5**
5. (i) Write short note on hyperbolic parabolic shell and enlist shells according to gauss curvature. **5**
- (ii) Write short note on flat slab. **5**
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