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B TECH
(SEM-VI) THEORY EXAMINATION 2017-18
DESIGN OF CONCRETE STRUCTURE II

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. Assume missing data suitable, if any.
2. IS 456:2000 permitted.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a) Define limitations of flat slab.
b) Define column head.
c) Differentiate between shallow foundation and deep foundation.
d) Find the depth of foundation required for a column carrying an axial load of 165KN. The safe bearing capacity of the soil is 150KN/m^2. The soil at the site weight 18KN/m^3 and has a angle of repose of 30^0.
e) What do you mean by culvert?
f) Write the name of types of retaining wall**.**
g) Differentiate between the over head tank and underground tank..
h) What is an 'Intze tank'?
i) Write a short note on creep.
j) What is Anchorage?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a) Design an interior panel of flat slab with size 6x6 m^2 Supported by Column of diameter 500 mm, provide Suitable Drop. Take live load 4kn/m^2 use M25 and Fe 415.
b) Determine the plan dimensions of a R.C.C. footing for a column subjected to a characteristics load of 1000KN and moment about the major axis M_x = 180KM/m. the size of the column is 300mm x 750mm. the safe bearing capacity of the soil is 200KN/m^2.
c) Design a slab culvert of a clear span of 6m for class AA tracked vehicle loading. Clear width of roadway is 7m. average thickness of wearing coat may be taken as 75mm. Use M20 concrete and Fe-415 steel.
d) Design a circular tank12m diameter and 4m high. The tank rest on the ground. the walls of the tank are restrained or monolithic at base. Use M20 concrete and Fe-415 steel.
e) Write various losses in prestressing.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

a) Design an interior panel of a flat slab of size 5m*5m without providing drop and column head. Size of columns is 500mm*500mm and live load on the panel is 4kn/m^2. Take floor finishing load as 1kn/m^2 Use M20 concrete and Fe 415 steel.

b) Write the methods of analysis and design of flat slab. Explain any one of them.

4. Attempt any *one* part of the following: 10 x 1 = 10

a) A rectangular cross section of a curved beam is 400mm x 600mm. it is subjected to a bending moment of 70KN-m, torsional moment of 30KN-m and shear force of 40KN. Design the beam using M20 concrete grade and Fe-415 steel grade

b) Design a square footing of uniform thickness for an axially loaded column of 450mm x 450mm size. The safe bearing capacity of the soil is 190KN/m^2. Load from the column is 850KN(including self weight of column). Use M20 concrete and Fe-415 steel

5. Attempt any *one* part of the following: 10 x 1 = 10

a) Design square water tank 5m x 5m x 3m (high), using any method. Tank is open at the top and the walls are fixed to the base which rests on the ground. Use M20 concrete and Fe-415 steel.

b) Determine the internal dimensions of a intze type tank for a capacity of 250KL. c/c diameter of staging shall be taken as 7.5m and central diameter of cylindrical wall shall be taken as 9.5m. Vertical wall is 120mm thick. Cone makes an angle of 45^0 with the horizontal. .

6. Attempt any *one* part of the following: 10 x 1 = 10

a) Design a cantilever type of retaining wall to retain sand for 3075m above the ground level. The sand fill slops at the rate of 1 vertical to 2 horizontal. The weight of sand is 18KN/m^3. The safe bearing capacity of the soil is 200KN/m^2 at a depth of 1.25m below the ground level. The angle of repose of the soil is 30^0. Use M20 concrete and Fe-415 steel. Take $\mu = 0.6$

b) Explain design principle of cantilever retaining wall.

7. Attempt any *one* part of the following: 10 x 1 = 10

a) State the assumption made in prestressed concrete design

b) Determine the profile of a load balancing cable for a beam of span 8 m carrying an all inclusive load of 40KN/m. The prestressing force in the tendon is 1250KN. The section of the beam is 450mm x 600mm. find also the stress on the beam section.