Printed Pages:02 **Sub Code:NCE021/ECE021**

Paper Id 100235 **Roll No.** | | | | | | | | | | |

B TECH
(SEM VI) THEORY EXAMINATION 2018-19
ADVANCED CONCRETE DESIGN

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.IS 456 and IS3370 is permitted

SECTION A

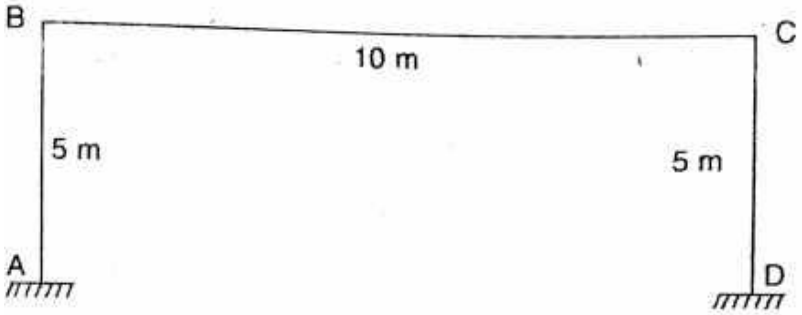
1. Attempt *all* questions in brief. **2 x 10 = 20**

a. List out useable type of water tanks.
b. What are important factors in the design of R.C. water tank?
c. Define bottom slab of tanks.
d. What are you understand by single storied portal frames?
e. Draw the sketch of multistory frames.
f. Define R.C.C. bridges.
g. What to you understand by composite sections?
h. Define high performance concrete.
i. What do you understand by composite slabs?
j. How wind load affect the over head water tanks?

SECTION B

2. Attempt any *three* of the following: **10x3=30**

a. Write the Is code recommendations regarding detailing in water tanks.
b. Explain various kinds of joints used in water tanks with neat sketches.
c. Figure shows an intermediate frame provided for a building. These frames are spaced at 3.50m centers. Design the roof slab and an intermediate portal frame .The live load on the roof slab may be taken as 1500 N/mm^2 .use M20 concrete and fe415 steel. Safe bearing capacity of the soil is 105 kN/m^2.



d. What is effective width method for design of bridges? Also explain the terms impact factor and tractive forces.
e. Discuss the following w.r.t. high performance concrete: (i) Water-cement ratio (ii) Role of Pozzolona (iii) Compatibility of Portland cement and super platicizers.

SECTION C

3. Attempt any *one* part of the following: **10x1=10**

a. Design a circular water tank with a flexible base for a tank of 1, 00,000litre capacity. The depth of water in the tank is 5 m. Use M25 concrete and Fe415 steel. Take unit weight of water as 9.8 kN/m^2.
b. Draw the figure of Rectangular tanks with ratio L/B < 2 and Show the loading pressure and find out bending moments.

4. Attempt any *one* part of the following: 10x1=10

a. Design the foundation for an INTZE type water tank supported on an elevated tower consisting 8 columns. The diameter of the bean is 10 m. The load on each column is 2500 N. Safe bearing capacity of soil is 240 kN/m^2. Use M2065 and Fe415 steel. Take constants as k_1=0.0083 , k_2=0.0041 and k_3=0.006

b. What do you understand by plate girder? Write the design principles of plate girder .draw neat sketch.

5. Attempt any *one* part of the following: 10x1=10

a. A T-beam bridge is to be designed for a clear span of 5 m having a clear roadway of 10 m between kerbs for a single vehicle of IRC class AA or two vehicles of class A loadings.

b. Design a reinforced concrete slab culvert for a National Highway to suit the following data. Carriageway – two lane (7.5m wide), Footpath- 1 mtr on either side, clear span =6 mtr, wearing coat=80 mmm , Width of bearing =0.4m, Use M25 concrete and HYSD steel. Loading – I.R.C. class AA tracked vehicle.

6. Attempt any *one* part of the following: 10x1=10

a. Determine the maximum live load bending moment in the exterior girder of the T Beam and slab of example for two trains of IRC class A loading using Courbon's method and compare the live load bending moment with that of IRC class AA tracked vehicles loading.

b. What is the function of bearing in bridges? Explain the function of expansion joint and contraction joint.

7. Attempt any *one* part of the following: 10x1=10

a. Design a composite beam for the following data: Flange width =1600 mm, Thickness of slab =120 00, span =10m, Load 25kn/m. Use m20 and Fe415 steel.

b. Explain how horizontal load cases BM in columns and Bracer of staging?