*Total No. of Questions : 8]* *[Total No. of Printed Pages : 2*

**Roll No .....**

# CE-7001-CBGS

## B.E. VII Semester

Examination, December 2020

## Choice Based Grading System (CBGS)

### Advance Structural Design -I (RCC)

***Time : Three Hours***

***Maximum Marks : 70***

***Note:*** i) Attempt any five questions.

ii) All questions carry equal marks..

1. a) A portal frame with ends hinged is to be analysed for the following data: Spacing of portal frames = 4.8m, Height of columns = 5m, distance between column centers = 10m, live load on roof = 2 kN/$m^2$. Find design moments.

   b) Write down the different type of bracing used in multistorey building. Explain it's importance.

2. Write short notes on the following: (Any four)

   a) IRC loadings for road bridges.

   b) Losses in prestressed concrete.

   c) Braced and unbraced building.

   d) Functions and types of shear wall.

   e) Merits and demerits of prestressed concrete.

3. Design the top Dome, top ring beam and cylindrical wall of an intze tank. The dia. of tank is 8m and height of cylindrical wall is 4.5m. Use M-25 concrete and Fe-415 steel.

4. Design of side walls of a bunker to store 300 kN of coal, for the following data:
   Unit weight of coal = 8340 N/m$^3$
   Angle of repose = 30$^o$
   The stored coal is to be surcharged at its angle of repose. Take permissible stress in steel as 140 N/mm$^2$.

5. Distinguish clearly between a bunker and a silo. Using Airy's theory, show that the height up to which a bin behaves as a shallow one is given by

$$h = b\left[\mu + \sqrt{\frac{\mu\left(1+\mu^2\right)}{\mu+\mu'}}\right]$$

6. a) Explain Sway and Non Sway Building.
   b) Explain different type of Earth Retaining Structures.

7. Explain substitute frames and loading conditions for maximum moment values of different critical points of a building frame.

8. a) Determine the eccentricity of loads in a 4 lane carriage way due to the following load cases-
      i) Single lane of class AA tracked loading
      ii) Two lanes of class AA wheeled vehicles
   b) A slab bridge has a clear span of 10 m and a clear roadway on 7.5 m between kerbs. Determine-
      i) The effective width of slab for absolute maximum binding moment due to IRC class A vehicle - 2 nos.
      ii) The absolute maximum binding moment for the above case.

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