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RM-7669

B. E. - IV (Sem. VIII) (Civil) Examination

May / June – 2010

Design of Advance Concrete Structures

(Elective - I)

Time : 4 Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 4 (Sem. 8) (Civil)**

Name of the Subject :

☛ **Design of Advance Concrete Structures**

☛ Subject Code No. : **7 6 6 9** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Use of IS-456:2000 and interaction charts from SP-16 is permitted.

(3) Wherever not mentioned, the materails are M_{20} and Fe 415.

(4) Assume suitable data if necessary and mention them clearly.

(5) Neatly drawn pencil sketches will earn special credits.

SECTION - I

1 (a) Write functions of drop and column head. **2**

(b) Design the interior panel of flat slab without drop and column head by direct design method with the following data: **23**

(i) Panel size 5m × 7.5 m

(ii) Live load 4 kN/m^2

(iii) Floor finish 1 kN/m^2

(iv) Storey height 4m

(v) Column size 300 mm × 500 mm

OR

1 Design the interior panel of flat slab 6m x 6m in size, for live load 4 kN/m^2. Consider storey height 4m. Drop and column head shall be provided. **25**

2 (a) Draw sketches for different types of portal frame. **2**

(b) An industrial building is to be designed, which consists of continuous RCC slabs supported by portal frames. The following data is available. **23**

Spacing of portal frame = 3.6 m

Height of ceiling = 4 m

Distance between column centres = 8m

Live load on roof = 1.5 kN/m^2

Thickness of RCC slab = 120 mm

Assume ends of portal frames are hinged.

Analyse the portal frame and complete the design of beam and column with sketch.

SECTION - II

3 (a) Differentiate Bunkers and Silos in detail. **6**

(b) Design and detail of silo of inside diameter 4^m, height of cylindrical wall of 16^m. The conical bottom sloping 45^o, with 50 cm opening the bottom. Density of infill material 14.4 kN/m^3. **20**

M = 0.316 and $\mu' = 0.554$. Use Janssen's theory and M20 - Fe 250.

4 Design a spherical dome for a hall of diameter 16^m and rise of 2.5^m. The live load is 0.80 kN/m^2 and flourish load is 1.0 kN/m^2. A lantern load of 20 kN is also applied over top area of 1.50^m diameter near crown. Also design ring beam. Draw neat sketch for reinforcement. **24**

OR

4 A circular continuous girder for the raft foundation of a water tower has a mean diameter of 10.50 m. The uniformly distributed load transmitted by six symmetrically placed columns on the girder being 380 kN/m. The width of the beam is 500 mm and overall depth is 1000 mm. Design suitable reinforcements for the girder considering columns transmit only vertical loads (without any fixed end movements).