BTS (C) – VIII – 09 – 004 – Z

B. Tech Degree VIII Semester Examination, April 2009

CE 804 (A) ADVANCED DESIGN OF STRUCTURES

(1999 Scheme)

Time : 3 Hours Maximum Marks : 100

(Use of IS 456 and SP 16 permitted)
(Assume suitable data wherever necessary)

I. Design the interior panel of a flat slab with drop 5.5 m x 6.0 m in size to carry a superimposed load of 7 kN/m^2. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. (25)

OR

II. Design a ribbed slab for a room 8 m x 8 m. The live load is 3 kN/m^2 with rib spacing of 2 m c/c. Use M20 concrete and Fe 415 steel. Sketch the details. (25)

III. Design a RCC chimney 40 m high above ground level, 3.6 m external dia with fire brick lining, 12 cm thick with an air gap of 8 cm. The temperature above atmosphere goes up by 220°C. The coefficient of expansion in RCC may be taken as 11 x 10^{-6} per degree centigrade. Es = 2.1 x 10^6 Kg/cm^2. The wind load upto 30 m from GL may be taken as 0.8 kN/m^2 and above it as 1 kN/m^2. Use M25 concrete and Fe 415 steel. Safe bearing capacity of soil is 200 kN/m^2. (25)

OR

IV. Design a silo to store 380 kN of clinkers. The angle of repose of clinkers is 27° and the storage is upto the angle of repose. The unit weight of clinker is 1200 Kg/m^3. Assume other data as required stating them in the beginning of the answer. (25)

V. (a) Derive the membrane theory equations for cylindrical shells. (15)
(b) What are the various advantages of shell structures over conventional structures? (10)

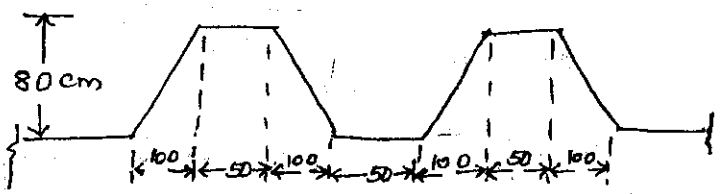
OR

VI. Design the roof with dome shape for a circular water tank having 10 m external diameter. The thickness of tank wall is 20 cm. Use M20 concrete and Fe 415 grade steel. Assume suitable data wherever necessary. Draw the reinforcement details. (25)

VII. (a) Describe in detail the Whitney's method of analysis of folded plates. (15)
(b) Explain the advantages and limitations of folded plate roofs. (10)

OR

VIII. Design a folded plate and sketch details of reinforcements with following data :



Measurements are in cm.

Thickness of folded plate is 10 cm. Load including self weight. And superimposed load is 4 kN/m^2. Use M20 concrete and Fe 415 grade steel. (25)

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