

**B.Tech Degree VIII Semester Examination in
Civil Engineering, November 2002**

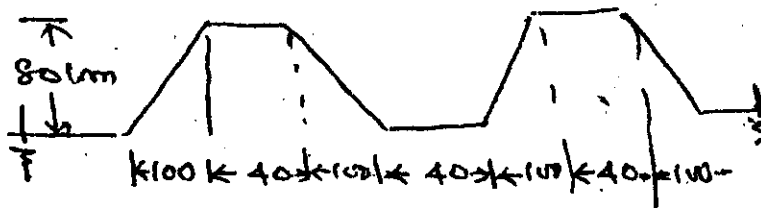
**CE 804 (A) ADVANCED DESIGN OF STRUCTURES
(1998 Admissions)**

Time: 3 Hours

Max. Marks: 100

Uses of IS 456 and SP 16 are permitted. Assume suitable data wherever required.
Draw neat sketches as required.

- I. Design a flat slab 6.0M x 5.5M with drops to carry a superimposed load of 6 KN/m². Use M20 concrete and Fe 415 grade steel. (25)
- OR**
- II. Design a ribbed slab for a panel in continuous floor system having the effective span of 5.5M x 5.5M. Adopt the slab thickness of 8 cm. The superimposed load is 5 KN/m². Use M20 concrete and Fe 415 grade steel. (25)
- III. Design a RCC chimney 42M high above ground level, 3.6M 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 11×10^{-6} per degree centigrade. $E_s = 2.1 \times 10^6 \text{ kg/cm}^2$. The wind load up to 30M from GL may be taken as 0.8KN/m² and above it as 1 KN/m². Use M25 concrete and Fe 415 steel safe bearing capacity of soil is 200 KN/m². (25)
- OR**
- IV. Design a silo to store 360 KN of clinkers. The angle of repose of clinkers is 25° and the storage is upto the angle of repose. The unit weight of clinker is 1200 kg/m³. Assume other datas as required stating them in the beginning of the answer. (25)
- V. (a) Explain the structural behaviour of cylindrical shells. (10)
(b) Derive equations for T_x , S and T_ϕ using membrane theory for a shell under self load having circular diretrix. (15)
- OR**
- VI. Design the roof with dome shape for a circular water tank having 11.0M external diameter. The thickness of tank wall is 20cm. Use M20 concrete and Fe 415 grade steel. Assume suitable data. Detail reinforcements. (25)
- VII. (a) Explain the advantages and limitations of folded plate roofs. (10)
(b) Draw neat sketches naming various parts of types of folded plate roofs. Explain the structural analysis of folded plates in methodical form. (15)
- 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 wt and superimposed load is 4 KN/m². Use M20 concrete and Fe 415 grade steel.

