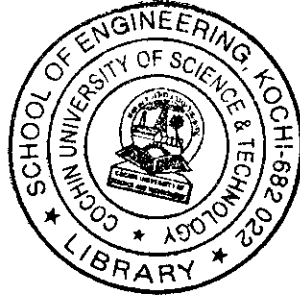## B.Tech. Degree VIII Semester (Supplementary) Examination in Civil Engineering (Habitat Engineering and Construction Management), May 2003

CE 804 (A) ADVANCED DESIGN OF STRUCTURES - II
(1995 Admissions)

Time: 3 Hours   Maximum Marks: 100

I. Design the interior panel of a flat slab 6.5 m x 6.5 m supported on circular columns of 400 mm diameter. Drops shall be provided. Live load acting on the slab is 4.5 kN/m² and the floor height is 3.6 m. Use M_{15} concrete and Fe_{415} steel.   (30)

OR

II. (a) Design the roof of a hall 24 m x 16 m as two way ribbed floor supported on bearing walls around. The live load on the floor is 5 kN/m² and the finishing load is 1 kN/m².   (15)

(b) A single span deep beam has the following data:

Effective span	= 6 m
Overall depth	= 6 m
Width of support	= 0.6 m
Width of beam	= 0.4 m
Total load on the beam including self weight	= 400 kN/m.
Concrete grade	= M_{20}
Steel grade	= Fe_{415}

Design the beam and sketch the reinforcement details.   (15)

(Turn over)

III. The substitute frame of a multi storeyed building having 3 bays has a continuous beam ABCD with AB = 4m; BC = 2.5 m and CD = 4 m. The beams are spaced at 3 m intervals. Thickness of floor slab is 120 mm. Live load = 4 kN/m^2. Floor finish = 0.6 kN/m^2. Size of beams = 250 mm x 400 mm. Size of columns = 250 mm x 400 mm. Height between floors = 4 m. Analyse the substitute frame and estimate the maximum design moments in the beams and columns. (30)

OR

IV. A four storeyed multi storey building frame has 4 equal bays of 4 m each and the height between floors is 4 m. The wind load acting at roof level = 5 kN and that acting at various floor levels = 10 kN each. All the columns have the same cross section. Determine the moments in the columns and beams by cantilever method. (30)

V. (a) Explain the classification of shells. (5)

(b) Describe the design criteria for shells. (15)

OR

VI. Analyse a reinforced concrete shell with circular directrix to the following data:

Span = 6 m

Radius = 6 m

Thickness = 50 mm

Semi central angle = 60°

Live load = 1.5 kN/m^2 (20)

VII. (a) Explain Simpson's method of analysis of folded plates. (12)

(b) Describe slab action and plate action with reference to folded plates. (8)

OR

VIII. A prismatic folded plate ABCDE shown in fig.1 supports a live load of 0.4 kN/m^2 in addition to the self weight. Estimate the stresses developed in the plate at mid span section if the plates BC, CD and DE are 120 mm thick and plates AB and EF are 250 mm thick. Span of the folded plate = 8 m. (20)

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