

- (b) orthotropically reinforced square slab in fixed and simply supported condition by equilibrium method.
9. (a) A rectangular slab $4\text{ m} \times 5\text{ m}$ is simply supported at the ends. Design the slab to carry superimposed service load of 5 kN/m^2 . If the slab is isotropically reinforced, use M20 and Fe 415. 10
- (b) Draw yield line pattern for different end conditions for square and rectangular slab. 10

**B.Tech 6th Semester (Civil) F-Scheme Examination,
May-2017**

DESIGN OF CONCRETE STRUCTURE-II

Paper-CE-302-F

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt any five questions, all questions carry equal marks. Question No.1 is compulsory. Taking at least one question from each unit.

USE OF IS CODE is allowed, assume suitable data if not provided.

1. Write short note on : 20
- (a) General design consideration for design of Staircases
 - (b) Design for beam curved in plan
 - (c) Redistribution of moments
 - (d) Assumption in yield line theory

Unit-I

2. A reinforced concrete continuous beam ABCD consists of three spans. The exterior span AB and CD are 7 meter each and the interior Span BC is 9 m. The characteristic dead load inclusive of self weight is 25 kN/m and characteristic imposed load is 32 kN/m . Draw the bending moment envelope for the ultimate condition. 20

3. Design an interior panel of a flat slab $5.6 \text{ m} \times 6.6 \text{ m}$ in size. The slab is supported on columns of 600 mm in diameter. The height of column above and below the slab is 4 meter. The super imposed load on the slab is 7.75 kN/m^2 . Use M20 and Fe 415. 20

Unit-II

4. Design a strap footing for two columns A and B, spaced 5 meter center to center. Column A $300 \text{ mm} \times 300 \text{ mm}$ in size carries a load of 600 kN, and it is on property line. Column B $400 \text{ mm} \times 400 \text{ mm}$ in size carries a load of 900 kN. The bearing capacity of soil is 120 kN/m^2 . Use M20 and Fe 415. 20
5. A cement silo has an internal diameter of 10 meter with the height of cylindrical portion being 30 meter. The density of cement is 15.2 kN/m^3 . Coefficient of friction between concrete and material is 0.70. The angle of repose of the material is 17.5° . Adopt M 20 and Fe 415. Design the thickness and reinforcement required at the bottom of the cylindrical portion. 20

Unit-III

6. (a) A pretensioned concrete beam section is 7 meter span 350 mm wide and 500 mm deep. The initial prestressing force is 1500 kN. The cable has cross sectional area of 1500 mm^2 of steel, and has a parabolic profile with the eccentricity of 100 mm at mid span. Determine the loss of prestress. $E_s = 2.1 \times 10^5 \text{ N/mm}^2$ and $E_c = 3 \times 10^4 \text{ N/mm}^2$. 10
- (b) Explain classification and types of prestressing. 10
7. A four bay multistoried frame has the following details. Continuous beam ABCDE with $AB=BC=CD=DE=54 \text{ meter}$. Height between floors = 4 meters; size of beams = 350 mm by 500 mm . size of column = 350 mm by 350 mm . thickness of floor slabs = 180 mm . floor finish = 1.5 kN/m^2 , live load = 2 kN/m^2 . Estimate the maximum design moments in the beams and columns. Assume four stories in building. 20

Unit-IV

8. Derive formulas for ultimate moment capacity for :
(a) isotropically reinforced square slab