(b) orthotropically reinforced square slab in fixed and simply supported condition by equilibrium method.

9. (a) A rectangular slab 4 m × 5 m is simply supported at the ends. Design the slab to carry superimposed service load of 5 kN/m². If the slab is istropically 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 m × 6.6 meter 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/m². 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 300mm × 300 mm in size carries a load of 600 kN, and it is on property line. Column B 400 mm × 400 mm in size carries a load of 900 kN. The bearing capacity of soil is 120 kN/m². 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/m³. Coefficient of friction between concrete and material is 0.70. The angle of repose of the material is 17.5 degree. 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 mm² of steel, and has a parabolic profile with the eccentricity of 100 mm at mid span. Determine the loss of prestress. $Es=2.1 \times 10^5$ N/mm² and $Ec=3\times10^4$ N/mm². 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 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/m², live load=2 kN/m². 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