Roll No. .....

24378

B. Tech. 6th Semester (Civil)

Examination – May, 2019

DESIGN OF CONCRETE STRUCTURES - II

Paper : CE-302-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions in all, selecting *one* question from each Unit. Question Number **1** is ***compulsory.*** All questions carry equal marks.

1. Write short note on : 20

(a) General design consideration for design of Staircases

(b) Magnel's method of prestressing

(c) Silo and bunkers design consideration

(d) Yield line patterns and failure

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UNIT – I

2. A reinforced concrete continuous beam ABCD consists of three spans. The exterior span AB and CD are 6 meter each and the interior Span BC is 8 m. The characteristic dead load inclusive of self weight is 24 kN / m and characteristic imposed load is 30 kN / m. Draw the bending moment envelope for the ultimate condition. 20

3. Design an interior panel of a flat slab 5.2 m × 6.2 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. A finishing surface of 20 mm thickness is provided over the flat Slab. The floor of slab is likely to be used as a classroom. Use M20 and Fe 415. 20

UNIT – II

4. Two reinforced concrete column 800 mm × 800 mm and 600 mm × 600 mm in size carry axial load of 1500 kN and 1000 kN, respectively. These columns are placed 5 meter apart center to center. The safe bearing capacity of soil is 200 kN/m². Design beam and slab type rectangular combined footing. The cantilever projection available from the property line of column 1 is 1.72 meter. Use M20 and Fe 415. 20

5. Design a circular bunker to storey 20 tones of coal. Density of coal = 9 kN/m³. Angle of repose = 30 degree. Use limit state method of design. Use M20 and FE 415. Sketch the details of reinforcement in bunker, including cylindrical wall and Hopper bottom. Assume other data suitably. 20

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UNIT – III

6. A prestressed concrete beam section is 250 mm wide and 300 mm deep. The initial prestressing force is 450 kN at an eccentricity of 60 mm. The beam has a span of 5.75 meter, and has to carry a superimposed load of 7.50 kN/m. Analyses the beam section for the stresses produce at the mid span before and after application of live load. Allow a loss of prestress of 15%. Take weight of concrete equal to 24 kN/me. 20

7. A four bay multistoried frame has the following details. Continuous beam ABCDE with AB=BC=CD=DE=4 meter. Height between floors = 4 meters; size of beams = 300 mm by 500 mm. size of column = 300 mm by 400 mm. Thickness of floor slabs= 150 mm. floor finish =1 kN/m², live load = 2kN/m². Estimate the maximum design moments in the beams and columns. Assume four stories in building. 20

UNIT – IV

8. Design a reinforced concrete slab for a room measuring 4 meter × 5 meter from inside. The slab carries a live load of 2500 N/m², and is finished with 20 mm thick granolithic finishing, having unit weight. of 24 kN/m³. Use M20 and Fe250 steel. The slab is simply supported over the four edges with corner held down. Take width of supporting wall as 300 mm. 20

9. (a) What is the various assumptions in yield line theory method of analysis. 10

   (b) Draw yield line pattern for different end conditions for square and rectangular slab. 10
