B.Tech. (Civil) 4th Semester (F. Scheme)

Examination, May–2015

DESIGN OF CONCRETE STRUCTURE–I

Paper–CE-206-F

Time allowed : 3 hours]   *[Maximum marks : 100*

*Note : Attempt any **five** questions selecting **one** question from each unit. **Question No. 1 is compulsory.** All questions carry equal marks. Use M 20 concrete and Fe 415 steel.*

1.   Answer the following questions: 5×4=20

   (a)   Name any five plasticizers and describe any one in detail.

   (b)   Describe the factor on which workability is dependent.

   (c)   Discuss limit states of servicibility.

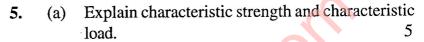   (d)   Describe how a slab is designed for concentrated load.

Unit–I

2.   (a)   Write a short note on water cement ratio.   10

   (b)   Why durability is important for a concrete structure ? How it is ensured ?   10

3.   (a)   Write down various assumptions of Limit state method.   10

   (b)   What do you understand by over and under reinforced beam ? Explain.   10

Unit–II

4. (a) Write a short note on steel beam theory. 5

(b) A rectangular beam section is reinforced on both side is 300 mm wide and having 550 mm depth. The centre of steel on both side are 50 mm away from respective edges. Determine the steel area on both side for a Bending Moment of 90 kNm. Solve by working stress method. 15

5. (a) Explain characteristic strength and characteristic load. 5

(b) Design a simply supported beam to carry a load of 14500 kN/m. The clear span of beam is 5.5 m. The bearing on each end is 300 mm. Assume permissible nominal shear stress as 0.3 N/mm². Solve by limit state. 15

Unit–III

6. (a) What are requirements of a good detailing in RCC ? 6

(b) Write a short note on spacing of reinforcement in slab. 8

(c) Discuss limit state of crack width. 6

7. Design a simply supported slab supported on masonry wall with following details. 20

(i) Clear span = 4 mtr

(ii) Line load = 3000 N/M².

(iii) Assume modification factor = 1.4

(iv) Assume permissible nominal shear stress = 0.3N/mm².

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Unit–IV

8. (a) Write a short note on reinforcement in columns.

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(b) Design a square column of Size 450 mm × 450 mm supporting on all exclusive load of 1800 kN. Also design the square footing for the column. The safe bearing capacity of soil is 200 kN/m².

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9. A RCC cantilever type Retaining wall is having 5.5 Mtr tall Stem. The wall retains soil level with its top. Soil density is 16000 N/m³ and has angle of repose = 30°. The safe bearing capacity of soil is 21000 N/m². Design the retaining wall.

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