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**B. Tech. 4th Semester Civil Engg. F. Scheme
Examination, May-2014**

DESIGN OF CONCRETE STRUCTURES-I

Paper-CE-206-F

Time allowed : 3 hours]

[Maximum marks : 100

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

1. Answer the following :

- (i) What are the various mode by which a retaining wall can fail.
- (ii) Write a short note on splicing of reinforcement.
- (iii) What are the assumptions made in limit state of design.
- (iv) What do you understand by slenderness ratio and why it is necessary to keep it low.

Unit-I

2. (a) Write a short note on workability of concrete. 10
- (b) What do you understand by admixture ? Describe any one admixture in detail. 10

3. (a) Describe stress ~ strain relation of steel in detail. 10
- (b) Write a short note on design philosophy of Reinforced concrete. 10

Unit-II

4. (a) Write down various assumptions of working stress method. 5
- (b) A rectangular singly reinforced beam has a span of 5 mtr and carries a UDL of 25 k-Nm. The width of the beam is chosen as 300 mm. Find the depth and steel requirement for a balanced section. Solve by working stress method. 15
5. (a) Describe the reasons due to which a doubly reinforced is used. 5
- (b) A simply supported Rcc beam is 250 mm wide with effective depth as 500 mm. It is reinforced with 4 bars of 20 mm diameter as tensile reinforcement. If the beam is subjected to a factored shear of 95 kN at support, design the shear reinforcement consisting of vertical struss. Design shear stress can be taken as 0.3 N/mm^2 . 15

Unit-III

6. (a) Why in slab control of deflection is important and how it is ensured ? 6
- (b) Write down various steps involved in design of a two way slab by IS method. 14
7. (a) Write down in brief on reinforcement in columns. 6
- (b) What are the values of span effective depth for different types of beam and why they are different ? 7
- (c) What are the factors on which the bond strength between concrete and steel is dependent and how it can be increased ? 7

Unit-IV

8. (a) A square column 400 mm×400mm supports a total load of 1500 kNM. Design the column and a square footing for this column. The safe bearing capacity of soil is 250 kN/m². 15
- (b) How is the design of a short column differ from that of a long column ? 5

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24197

9. Design a Rcc Cantilever Retaining Wall having a 5 mtr tall stem. The wall retains soil level with its top soil density is $18,000 \text{ kN/m}^3$ and has an angle of repose = 30° . The SBC of soil is 2000 N/m^2 .