**18CE503**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular / Supplementary) DEGREE EXAMINATION** | | | | | | | |
| **January, 2022** | | | | **Civil Engineering** | | | |
| **Fifth Semester** | | | | **Design of Concrete Structures** | | | |
| **Time:** Three Hours | | | | | **Maximum:** 50 Marks | | |
| *Answer* ***ANY FIVE* from the following***.* | | | | | | (5X10=50 Marks) | |
| **Assume any relevent data if necessary**  **UNIT-I** | | | | | | | |
| 1. |  | Explain design philosophies adopted for reinforced concrete structures? | | | | 10M | |
| **(OR)** | | | | | | | |
| 2. |  | Predict the moment of resistance of a singly reinforced beam 150mm wide and 300mmdeep effective. The reinforcement consists of 4 bars of 16mm diameter. The materials used are M20 and Fe250. | | | | 10M | |
| **UNIT-II** | | | | | | | |
| 3. |  | A RCC beam 250mm wide and 400mm effective depth is carrying a uniform distributed load of 16kN/m. The beam is reinforced with 4 bars of 22mm diameter. The span of the beam is 4m. Investigate the shear reinforcement to be provided. The materials used are M20 and Fe250. | | | | 10M | |
| **(OR)** | | | | | | | |
| 4. |  | Explain design procedure of RCC T-beams under flexure using IS code approach. | | | | 10M | |
| **UNIT-III** | | | | | | | |
| 5. |  | Design a simply supported RCC slab having clear dimensions 4m x 6m, with 300mm walls all around. Live load = 3kN/m2 and Floor finishes = 1.5kN/m2. The materials used are M30 and Fe415. | | | | 10M | |
| **(OR)** | | | | | | | |
| 6. |  | Design a simply supported RCC slab having clear dimensions 4m x 9m, with 300mm walls all around. Live load = 3kN/m2 and Floor finishes = 1.5kN/m2. The materials used are M30 and Fe415. | | | | 10M | |
| **UNIT-IV** | | | | | | | |
| 7. |  | A reinforced concrete short column is 400mm x 400mm and has 4 bars of 20mm diameter. Determine the load carrying capacity of column if M30 and Fe415 used. | | | | 10M | |
| **(OR)** | | | | | | | |
| 8. |  | Design the reinforcement to be provided for a column 400mm x 500mm subjected to following forces: Pu=1600kN, Mux=200kNm. Use M25 concrete and Fe415 steel. | | | | 10M | |
| **UNIT-V** | | | | | | | |
| 9. |  | Design an isolated rectangular footing for a column, 300 mm X 500 mm, reinforced with 6 bars of 25 mm diameter subjected to factored axial load of Pu= 1200kN. The safe soil bearing capacity may be taken as 200kN/m2. The materials used are M25 and Fe415. | | | | 10M | |
|  |  | **(OR)** | | | |  | |
| 10. |  | Design an isolated square footing for a column, 400 mm X 400 mm, reinforced with 8 bars of 20 mm diameter subjected to factored axial load of Pu= 1000kN. The safe soil bearing capacity may be taken as 200kN/m2. The materials used are M25 and Fe415. | | | | 10M | |

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**III/IV B.Tech (Regular / supplementary) Degree Examination**

**January, 2022 Civil Engineering**

**Fifth Semester Design of Concrete Structures**

**Time**: Three Hours Maximum: 50 Marks

**Note: Use of IS:456-2000 and SP:16-1980 is allowed.**

Answer ONE Question from each unit. (5 × 10 = 50 Marks)

**UNIT-I**

1. Explain methods of design for reinforced concrete structures? CO 1 (**10M**) **(OR)**
2. Predict the moment of resistance of a singly reinforced beam 150mm wide and 300mm deep effective. The reinforcement consists of 4 bars of 16mm diameter. The materials used are M20 and Fe250. CO 1 (**10M**)

**UNIT-II**

1. A RCC beam 250mm wide and 400mm effective depth is carrying a uniform distributed load of 16kN/m. The beam is reinforced with 4 bars of 22mm diameter. The span of the beam is 4m. Investigate the shear reinforcement to be provided. The materials used are M20 and Fe250.

CO 2 (**10M**)

**(OR)**

1. Explain design procedure of RCC beams under torsion using IS code approach. CO 2 (**10 M**)

**UNIT-III**

**5**. a) Explain steps in design of dog legged stair case. CO 3 (**6 M**)

b) Sketch two way slab detailing CO 3 (**4 M**)

**(OR)**

**6.** Design a simply supported RCC slab having clear dimensions 4m x 9m, with 300mm walls all

around. Live load = 3kN/m2 and Floor finishes = 1.5kN/m2. The materials used are M30 and

Fe415. CO 3 (**10 M**)

**UNIT-IV**

**7.** A reinforced concrete short column is 400mm x 400mm and has 4 bars of 20mm diameter. Determine the load carrying capacity of column if M30 and Fe415 used. CO 4 (**10 M**)

**(OR)**

**8.** Design the reinforcement to be provided for a column 400mm x 500mm subjected to following forces: Pu=1600kN, Mux=200kNm, Muy=150kNm. Use M25 concrete and Fe415 steel. CO 4 (**10 M**)

**UNIT-V**

9. Design an isolated footing for a column, 300 mm X 500 mm, reinforced with 6 bars of 25 mm diameter subjected to factored axial load of Pu= 1000kN. The safe soil bearing capacity may be taken as 200kN/m2. The materials used are M25 and Fe415. CO 5 (**10 M**)

**(OR)**

**10.** a) Explain procedure for design of eccentrically loaded isolated square footing. CO 5 (**6 M**)

b) Brief out significance of safe bearing capacity of soil in design of footing. CO 5 (**4 M**)