Code No: P18CET11

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)
III B.TECH I SEMESTER END REGULAR EXAMINATIONS, DEC/JAN-2022/23
DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES
(CE Branch)

Time: 3 hours                                                                  Max. Marks: 60

**Use of IS: 456 – 2000 and SP 16 (Charts and Tables) are permitted.**
**Use M20 concrete and Fe415 grade steel unless otherwise stated.**
**Missing data if any may suitably be assumed.**

Note: Question Paper consists of Two parts (Part-A and Part-B)
PART-A

Answer all the questions in Part-A (1X24=24M)

| Q.No. | | Questions | Marks | CO | KL |
|---|---|---|---|---|---|
| 1 | | Design a two way slab panel for the following data. Size = 7 m x 5 m Width of supports = 300 mm Edge condition = two short edges discontinuous Live load = 4 kN/m$^2$ Floor finish = 1 kN/m$^2$ Consider M20 grade concrete and Fe 415 grade steel Draw the detailing diagram for the two way slab. | [24M] | CO3 | L6 |
| | | **(or)** | | | |
| 2 | | Design a square column for the following data: Size of column = 450 mm x 450 mm Unsupported length = 4 m Factored load = 2500 kN Ultimate moment = 200 kNm Take the support condition: Fixed-Fixed Assume arrangement of reinforcement on two sides Use grade concrete as M25 and grade of steel as Fe415 Draw the detailing diagram for the longitudinal reinforcement and lateral ties of the column. | [24M] | CO4 | L6 |

**PART-B**

**Answer any Three Questions in Part-B (3X12=36M)**

| Q.No. | | Questions | Marks | C | KL |
|---|---|---|---|---|---|
| 3 | a) | Discuss the concepts of limit state design. | [6M] | CO1 | L2 |
| | b) | Explain the following with neat sketches: Under reinforced section Balanced section Over reinforced section | [6M] | CO1 | L2 |
| 4 | | A reinforced concrete beam of size 350 mm x 550 mm effective section is reinforced with 4 Nos. of 32 mm diameter bars. Determine the vertical shear reinforcement required to resist a shear force of 450 kN. Use M20 grade of concrete and Fe415 grade steel. | [12M] | CO2 | L3 |

| 5 | | Design a reinforced concrete slab for a roof of a hall 4 m x 10 m is simply supported with 230 mm walls. The slab carries a superimposed load of 4 kN/m$^2$ in addition to its dead weight. Take floor finish as 1 kN/m$^2$. Use grade concrete as M25 and grade of steel as Fe415. | [12M] | CO3 | L3 |
|---|---|---|---|---|---|
| 6 | | Design an axially loaded tied column 400 mm x 400 mm pinned at both ends with an unsupported length of 3 m to carry a factored load of 2300 kN. Use M30 grade of concrete and Fe415 grade steel. | [12M] | CO4 | L3 |
| 7 | | List out the different types of foundation. Discuss in detail with neat sketches. | [12M] | CO5 | L2 |

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