

[illegible]

Total No. of Questions : 10

Max. Marks : 50

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UNIT-III

5. Design concrete waist slab of stair case with 150mm riser and 300mm tread, total steps are 20 and landing is 1200mm. Take width of stair 1200mm. Assume live load as 4.0 kN/m^2 & density of concrete $24 \text{ kN/cubic meter}$. Draw sketch. (10)
6. Design a straight flight staircase in a residential building that is supported on reinforced concrete walls 1.5m apart (center-to-center) on both sides and carries a live load of 3.0 kN/m^2 . The risers are 16 cm and tread are 30 cm. Treads are provided with 3 cm thick marble finish while 2 cm thick plaster is applied to both the risers and bottom surfaces of the slab. Assume density of concrete $24 \text{ kN/cubic meter}$, finishes $22 \text{ kN/cubic meter}$ plaster $20 \text{ kN/cubic meter}$, concrete M25, reinforcing steel fe500. Draw sketch of design. (10)

UNIT-IV

7. a) What is interaction diagram in column design? (5)
b) Explain slender and short columns. (5)
8. Construct the interaction diagram for a column of size $b \times D$ with steel ratio $p/f_{ck} = 0.1$ for $d'/D = 0.1$ and Fe 250. Assume steel is placed equally on all sides. (10)

UNIT-V

9. a) What causes failure of foundations? (4)
b) What are the assumption made in design of footing? (2)
c) What are the difference between strap and Mat footing? Describe situations where these could use. (4)
10. A square footing has to transfer a dead load of 1000kN and an imposed load for a square column of size 400mm. Assume the safe bearing capacity of soil 120 kN/m^2 . Design square footing to support the above column Adopt M20 concrete and fe-415 grade steel. (10)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.