





**PART C (6 x 5 = 30 Marks)**

21. Explain the various types of shallow foundations. [K<sub>1</sub>]
22. Classify pile foundation based on its materials [K<sub>1</sub>]
23. Write down the steps involved in the analysis of well foundation based on Terzaghi's. [K<sub>4</sub>]
24. Write short notes on Foundation in Expansive Soil. [K<sub>2</sub>]
25. List out the various types of Machine Foundation [K<sub>1</sub>]
26. A 4 X 4 pile group in a cohesive deposit having  $q_u=180$  kPa, carries a load of 10,000 kN. The piles are of 0.5 m in diameter. Determine the length and spacing, assuming F.S =2.5 [K<sub>4</sub>]

**PART D (4 x 10 = 40 Marks)**

27. Find the plan Dimensions of a rectangular combined footing to support two columns 250 mm X 250 mm and 300mm X 300 mm carrying loads of 300 kN and 450 kN respectively. The columns are spaced at 4m c/c. the first column is on the boundary line. The allowable bearing capacity of the soil is 150 kPa. If the second column is also on the boundary line, find the plan dimensions of another (trapezoidal) combined footing. [K<sub>4</sub>]
28. A column 600 X 600 mm carrying a load of 2500 kN has to be supported on four piles each of 300 X 300 mm in section. The piles spaced at 1m c/c. Design the pile cap using M15 concrete and Fe 415 steel. [K<sub>4</sub>]
29. Explain with neat sketches the component parts of Well Foundation. [K<sub>1</sub>]
30. Give the necessary information required for the design & construction of transmission line tower foundations. What are the forces considered in design? [K<sub>2</sub>]

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