POLYTECHNIC, B.E/B.TECH, M.E/M.TECH, MBA, MCA & SCHOOL

Notes   *Available @*
Syllabus
Question Papers   www.binils.com
Results and Many more…

Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 50344

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fifth/Sixth Semester

Civil Engineering

CE 8591 – FOUNDATION ENGINEERING

(Common to : Environmental Engineering)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What are the corrections applied to SPT number?

2.   Mention the factors to be considered for selection of foundation.

3.   Define Safe Bearing Capacity.

4.   What are the factors affecting Bearing capacity of soil?

5.   Draw a contact pressure distribution of flexible footing on clay and sand.

6.   Under what circumstances combined footing is adopted.

7.   List the methods to determine load carrying capacity.

8.   Define Negative skin friction.

9.   Calculate the active earth pressure on retaining wall support a cohesionless soil. Unit weight of soil is 18 kN/m³.

10.   Write the assumptions to be made in rankines theory.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the different methods of soil boring with neat sketches.

Or

     (b) Describe the procedure of Standard Penetration Test.

12. (a) Determine the Safe Bearing Capacity of a rectangular footing 2.5 m × 2 m located at a depth of 2 m below the ground level in a soil of specific gravity 2.5 and void ratio 0.6 Degree of saturation is 50 %. $\phi = 20°$, $N_c = 17.7$, $N_q = 7.4$, $N_\gamma = 5$. Assume a Factor of Safety is 2 and the water table is at ground level.

Or

     (b) Enumerate the various causes and remedial measures of settlement? Explain the methods of minimizing settlements.

13. (a) Two columns having cross-sections of 250 mm × 250 mm and 300 mm × 300mm are loaded with 250 kN and 450 kN respectively. The centre to centre distance between two column is 4 m. Safe bearing capacity of soil is 150 kN/m². The footing is restricted to 200 mm from centre of first column. Proportion the dimension of a trapezoidal combined footing.   (7)

Or

     (b) (i) Discuss the choices of different shallow foundation with different site conditions.   (7)
          (ii) State the merits and demerits of each foundation type.   (6)

14. (a) (i) Explain the types of piles and their functions.   (7)
          (ii) And also discuss the factors influencing the selection of pile. (6)

Or

     (b) A square pile group of 9 piles of 20 cm diameter is arranged with a pile spacing of 1 m. The length of the piles is 8 m. Unit cohesion of the clay is 80 kN/m². Neglecting bearing at the tip of the piles. Determine the ultimate load carrying capacity of the pile group and group efficiency. Assume adhesion factor of 0.75.   (6)

15. (a) Explain in details about the Culmann's graphical method for finding active pressure with a neat sketch.

Or

     (b) A retaining wall of 4.5 m height support cohesionless soil. The top fill is horizontal and carries a uniform surcharge of 75 kN/m². Determine the active earth pressure on the wall per metre length of the wall. Water table is 1.5 m below the top of fill, Angle of internal friction of soil is 30°. Unit weight of soil is 18 kN/m³. The wall friction may be neglected.

POLYTECHNIC, B.E/B.TECH, M.E/M.TECH, MBA, MCA & SCHOOL

Notes   *Available @*
Syllabus
Question Papers   www.binils.com
Results and Many more…

PART C — (1 × 15 = 15 marks)

16. (a) Design a pile group to carry 2500 kN in a soil of uniform clay to a depth of 4.5 m underlain by hard rock. The unconfined compressive strength of the clay is 50 kN/m². Adopt a factor of safety of 3 against shear failure.

Or

(b) Design a square footing located at a depth of 1.5 m below the ground has to carry a safe load of 1000 kN. Size of column is 250 mm × 250 mm. Factor of safety is 3. The soil has the following properties e=0.55 at the degree of saturation 50%. G=2.65, C=10kN/m², $\phi = 30°$, Nc=37.2, Nq = 22.5, $N\gamma = 19.7$.

_____