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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, Dec, 2017



Program Name: Btech Civil Engg.
Course Name : FOUNDATION ENGG
Course Code : CEEG342
No. of page/s: 2

Semester – V
Max. Marks : 100
Duration : 3 Hrs

SECTION-A (4×5 = 20 Marks)

All questions are compulsory to attempt

Q.1. Discuss grip length in case of well foundation. Also discuss its importance in well foundation. **(CO2) (5)**

Q.2. Define the following terms:

(a) Resonance (b) group efficiency factor of pile, (c) group settlement ratio (d) period (e) degree of freedom. **(CO2, 3) (5)**

Q.3. Discuss swell pressure in detail. What is its significance? **(CO3) (5)**

Q.4. Discuss different type of settlement which can occur in a foundation. How are these estimated? **(CO1) (5)**

SECTION-B (4×10= 40 Marks)

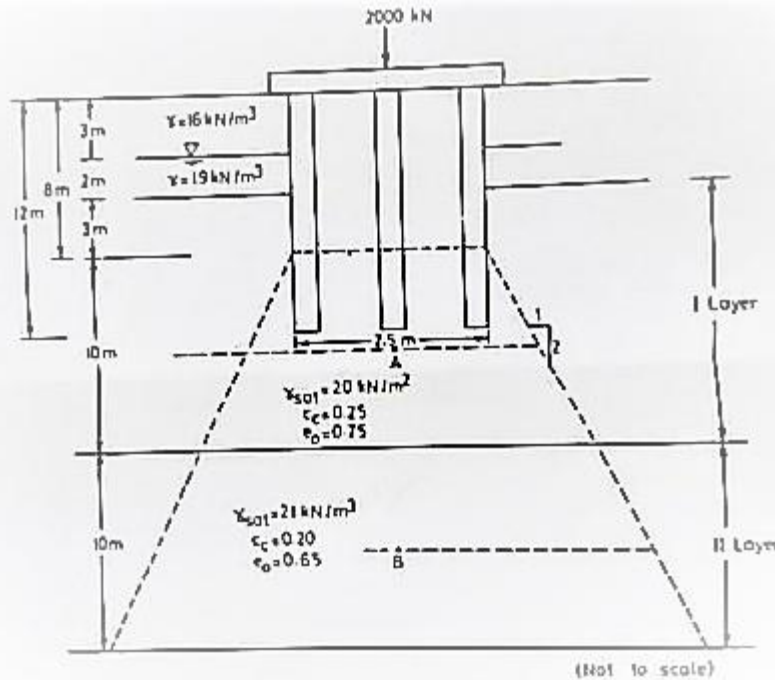
All questions are compulsory to attempt

Q.5. Discuss different shapes of well and characteristics of each type. Also discuss the various forces acting on well foundation. **(CO2) (10)**

Q.6. A group of 9 piles arranged in a square pattern with diameter and length of each pile at 25 cm and 10 m respectively, is used at a foundation in soft clay deposit. Taking the unconfined compressive strength of clay as 120 kN/m² and the pile spacing as 100 cm c/c. Find the safe load. Assume $N_c = 9$, $\alpha = 0.75$, FOS = 2.5 **(CO2) (10)**

Q.7. Discuss in detail the recent developments that happened in geotechnical engineering. **(CO3) (10)**

Q.8. A group of friction piles of 30 cm diameter is subjected to a net load of 2000 kN as shown in figure. Estimate the consolidation settlement of first layer and second layer both. For first layer $C_c = 0.25$, $e = 0.75$ and for second layer $C_c = 0.20$, $e = 0.65$.



(CO2) (10)

SECTION-C (2×20 = 40 Marks)

All questions are compulsory to attempt

Q.9. Compare the reduction in the average unit pressure on a horizontal plane immediately below the tips of 9 m long, 450 mm dia. friction piles embedded in clay, that will be caused by the shearing resistance along the perimeter of a single pile and of a 9 pile footing with that of a 36 pile footing 4 times larger with the spacing of piles equal to 1.2 m on centres. (CO2) (20)

Q.10. Discuss different type of pile foundation in detail. How would you estimate the load carrying capacity of pile in (a) cohesionless soil, (b) cohesive soil (CO2) (20)

OR

Q.10. (a) A square footing located at a depth 1.5 m from the ground surface carries a column load of 150 kN. The soil is submerged having an effective unit weight of 11 kN/m³ and an angle of shearing resistance of 36°. Find the size of footing using Terzaghi's theory if $F = 3$ and $N_q = 10$, $N_\gamma = 6$. (CO1) (10)

Q.10. (b) Discuss in detail the effect of swelling of soil on buildings. (CO3) (10)

