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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year II Semester Supplementary Examinations February-2022**

**FOUNDATION ENGINEERING**

(Civil Engineering)

Time: 3 hours

Max. Marks: 60

**PART-A**

(Answer all the Questions 5 x 2 = 10 Marks)

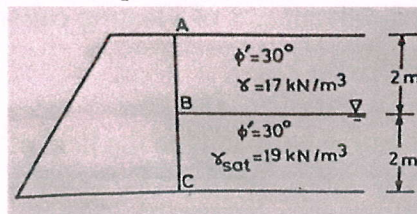
- |     |                                                    |    |
|-----|----------------------------------------------------|----|
| 1 a | Write short notes on plastic equilibrium in soils. | 2M |
| b   | Define Net ultimate bearing capacity               | 2M |
| c   | Write short notes on piles.                        | 2M |
| d   | Write short notes on Well foundation.              | 2M |
| e   | Write short notes on Machine foundations           | 2M |

**PART-B**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

- 2 Determine the lateral earth pressure at rest per unit length of wall as shown in fig. Also determine the resultant earth pressure. Take  $K_0 = 1 - \sin \phi'$ ,  $\gamma_w = 10 \text{ kN/m}^3$ .



10M

**OR**

- 3 With the help of neat sketch explain design of gravity retaining walls. 10M

**UNIT-II**

- |     |                                                                 |    |
|-----|-----------------------------------------------------------------|----|
| 4 a | With neat sketches explain different types of shear failures.   | 5M |
| b   | Write various points to consider for fixing depth of foundation | 5M |

**OR**

- |     |                                                                                                                                                                                                                                                    |    |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 5 a | Determine the ultimate bearing capacity of a square footing, resting on the surface of saturated clay of unconfined compressive strength of $98 \text{ kN/m}^2$ .                                                                                  | 5M |
| b   | A rectangular footing (3 m X 2 m) exerts a pressure of $100 \text{ kN/m}^2$ on a cohesive soil ( $E_s = 5 \times 10^4$ and $\mu = 0.50$ ). Determine the immediate settlement at the centre, assuming i) Footing is flexible ii) Footing is rigid. | 5M |

**UNIT-III**

- 6 A precast concrete pile (35cm x 35cm) is driven by a single acting steam hammer. Estimate the allowable load using (a) Engineering News Record Formula (F.S.=6) (b) Hiley Formula (F.S.=4) and (c) Danish Formula (F.S. =4).  
Use the following data.
- (i) Maximum rated Energy = 3500kN-m
  - (ii) Weight of hammer = 35kN
  - (iii) Length of pile = 15m
  - (iv) Efficiency of hammer = 0.8
  - (v) Coefficient of restitution = 0.5
  - (vi) Weight of pile cap = 3kN
  - (vii) No of blows for last 2.54mm = 6
  - (viii) Modulus of elasticity of concrete =  $2 \times 10^7$  kN/m<sup>2</sup>
  - (ix) Assume any other data, if required. Take the weight of pile as 73.5kN.

**10M****OR**

- 7 a How would you estimate the load carrying capacity of a pile in cohesion less soils by using static methods. **5M**  
b How would you estimate the load carrying capacity of a pile in cohesive soils by using static methods. **5M**

**UNIT-IV**

- What are the advantages and disadvantages of Floating caisson and discuss stability of floating caisson during flotation? **10M**
- 8

**OR**

- 9 Explain the construction of Floating caisson with the help of neat sketch. **10M**

**UNIT-V**

- 10 a Explain reinforcement and construction details of machine foundations. **5M**  
b List out various measures adopted for vibration isolation and control. **5M**

**OR**

- 11 A foundation block of weight 30kN rests on a soil for which the stiffness may be assumed as 25000kN/m. The machine is vibrated vertically by an exciting force of  $3.0 \sin(30t)$  kN. Find the natural frequency, natural period, natural circular frequency and the amplitude of vertical displacement. The damping factor is 0.50. **10M**

\*\*\*END\*\*\*