

G.R. No.	
----------	--

**DECEMBER 2021 - ENDSEM EXAM**  
**T. Y. B. TECH. (CIVIL) (SEMESTER - I)**  
**COURSE NAME: FOUNDATION ENGINEERING**  
**COURSE CODE: CVUA31184**  
**(PATTERN 2018)**

Time: [1Hr]

[Max. Marks: 30]

**(\*) Instructions to candidates:**

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

- Q.1 a Compare Pile foundation and Pier foundation (min four points) [4]
- Determine the capacity of pile by using following data. Dia. of pile = 600 mm, Length of pile = 7m,  $\Phi = 30^\circ$ , soil density =  $17 \text{ kN/m}^3$ ,  $c = 20 \text{ kN/m}^2$ , reduction factor,  $\alpha = 0.5$ ,  $N_c = 65$ ,  $N_q = 35$ ,  $N_r = 18$ , Factor of safety = 3. Assume suitable data is necessary and mention it clearly. [6]
- OR**
- Q2 a Enlist the methods of determining pile capacity. Explain any one method. [4]
- Q2 b Determine the ultimate capacity of single pile in clay with following data. Diameter of pile = 200mm, Length of the pile = 8m, Adhesion factor = 0.9,  $N_c = 9$ , Unconfined compressive strength of clay =  $100 \text{ kN/m}^2$ . Assume suitable data is necessary and mention it clearly. [6]
- Q.3 a Elaborate the importance of under reamed pile in respect with black cotton soil [4]
- Q.3 b Discuss swelling potential of soil and explain any one method for determination of swelling potential of black cotton soil. [6]
- OR**
- Q.4 a List any three engineering problems associated with black cotton soil. Explain any one in detail [4]
- Q.4 b Discuss the design criteria of under reamed pile with neat sketch. [6]



- Q.5 a      Elaborate with a neat sketch, the mechanism of reinforced soil. [4]
- Q.5 b      Discuss following terminologies correlated with earthquake.  
i) Epicenter ii) Focus iii) Focal depth iv) Epicentral distance v) [6]  
Foreshocks and aftershocks vi) Body waves
- OR**
- Q.6 a      Discuss the use of geosynthetics in road pavements. [4]
- Q.6 b      Elaborate the phenomenon of liquefaction and its effect on soil. [6]