

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- OCT-2018

B.Tech. VIth Semester

COURSE CODE: 10B11CE612

MAX. MARKS: 25

COURSE NAME: Foundation Engineering

COURSE CREDITS: 04

MAX. TIME: 1.5 Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1. Answer the following:

(1x5=5)

- Active and passive earth pressure.
- Determine the critical depth of excavation in a pure clayey soil with cohesion of 10kPa and unit weight of 18kN/m³.
- Provisions for minimum depth of foundation in sandy soils.
- Quick sand phenomena.
- Meyerhof's theory for bearing capacity for deep foundation.

Q.2 Derive Terzaghi's bearing capacity equation. Give a sketch of failure zones used in the derivation of this equation. (5)

Q.3 A building has to be supported on a RCC raft foundation of dimension 14x21 m. The subsoil is pure clay having average unconfined compressive strength of 15 kN/m². The safe pressure on the soil due to weight of the building and other loads carried by it is 140 kN/m² at the base of the raft. Calculate the depth at which the bottom of the raft be placed so as to have a FOS of 3 against shear failure. Take unit weight of clay as 19kN/m³. Mention and justify the type of theoretical approach used. (5)

Q.4 A square footing of size 3 m is located in a dense sand at a depth of 2 m. Determine the ultimate bearing capacity for the following water table positions: (2x3=6)

- (i) At ground surface (ii) At footing level (iii) At 1m below the footing level

The saturated unit weight of the sand is 20 kN/m³ and moist unit weight of sand above the water table is 18kN/m³. Take $\phi=35^\circ$, $c=0$ and $N_\gamma=34$.

Q.5 Write short notes on:

(2x2=4)

- (i) Types of piles (ii) Methods of soil exploration