

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST-1 EXAMINATION- FEBRUARY -2018

## B.Tech VI Semester

COURSE CODE: 10B11CE612

MAX. MARKS: 15

COURSE NAME: FOUNDATION ENGINEERING

COURSE CREDITS: 04

MAX. TIME: 1 HR

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*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required.*

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1. A clay stratum 5 m thick has a initial void ratio of 1.5 and effective overburden pressure of 120 kN/m<sup>2</sup>. When the sample is subjected to an increase of pressure of 120 kN/m<sup>2</sup>, the void ratio reduces to 1.44. Determine the coefficient of volume compressibility and final settlement of the stratum. [3]
2. A cylindrical specimen of a saturated soil fails under an axial stress of 150kPa in an unconfined compression test. The failure plane makes an angle of 52° with the horizontal. Calculate the cohesion and angle of internal friction of the soil. [3]
3. Derive the relation for critical excavation depth for a vertical unsupported cut in a clayey soil using pressure distribution diagram. [3]
4. A retaining wall with a smooth vertical back is 4 m high. The horizontal surface of the backfill is in level with the top of the wall. There is a uniformly distributed surcharge load of 36 kN/m<sup>2</sup> intensity over the backfill. The water table is located at 1.5 m below the top surface. The properties of backfill soil are:  
 $C=0$ ,  $\gamma=18 \text{ kN/m}^3$ ,  $\gamma_{\text{sub}}=12 \text{ kN/m}^3$ ,  $\phi=30^\circ$ .  
Determine the magnitude and point of application of total active thrust per meter length of the wall. [6]