

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -I EXAMINATION- Feb 2024

B Tech-IV Semester (CE)

COURSE CODE (CREDITS):18B11CE411

MAX. MARKS: 15

COURSE NAME: Geotechnical Engineering

COURSE INSTRUCTORS: Prof. Ashok Kumar Gupta

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

Q1. An embankment, having a total volume of 5000 m³ has a water content of 16% and dry density of 1.75 g/cm³. If it was constructed from a borrow pit where the undisturbed soil has a water content of 13% and voids ratio of 0.6, calculate the quantity of soil which was excavated for the construction of the above embankment. Take specific gravity of soil solids as 2.68. (4)

Q2. Test on a fill reveal that one cubic metre of soil in the fill weighs 1624 kg and after being dried, 1.40 tonnes. If the specific gravity of solids is 2.65, determine the water content, void ratio, porosity and degree of saturation of the soil mass in moist state. (4)

Q3. A soil sample is partially saturated. Its natural moisture content was found to be 22% and bulk density 2 g/cm³. If the specific gravity of solid particles is 2.65 and the density of water be taken as 1 g/cm³, find out the degree of saturation and the void ratio. (3)

Q4. a) Drive relationships between void ratio and porosity, b) Drive relationships between void ratio, water content, bulk unit weight and unit weight of water. (4)