JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- April -2024

COURSE CODE (CREDITS): 18B11CE411

COURSE NAME: Geotechnical Engineering

COURSE INSTRUCTORS: Ashok Kumar Gupta

MAX. MARKS: 25

MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in brackets.

1. Calculate the coefficient of permeability of a soil sample, 6 cm in height and 50 cm² in cross-sectional area, if a quantity of water equal to 430 ml passed down in 10 minutes, under an effective constant head of 40 cm. On oven-drying, the test specimen has mass of 498 g. Taking the specific gravity of soil solids as 2.65, calculate the seepage velocity of water during the test.

(5)

2. What will be the ratio of average permeability in horizontal direction to that in the vertical direction for a soil deposit consisting of three horizontal layers, if the thickness and permeability of the second layer are twice of those of the first and those of the third layer twice those of second?

(5)

3. In a permeameter test on a silty clay sample, the following results were obtained: sample length 12 mm; sample diameter 80 mm; initial head 1200 mm; final head 400 mm; time for fall in head 6 minutes; stand pipe diameter 4 mm. Find the co-efficient of permeability of the soil in mm/sec.

(5)

4. Define LL, PL and SL experimentally and theoretically. What is PI? Draw plasticity chart and explain it use in classifying the soils. What types of soils can be classified using this chart? Mention the name of the relevant code.

(6)

5. A soil deposit has a void ratio of 0.9. If the void ratio is reduced to 0.6 by compaction, find the percentage volume loss due to compaction.

(4)