

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-IV Semester (CE)

COURSE CODE (CREDITS): 18B11CE411

MAX. MARKS: 25

COURSE NAME: Geotechnical Engineering

COURSE INSTRUCTORS: Dr. Niraj Singh Parihar

MAX. TIME: 1 Hr 30 Mins

Note: (a) All questions are compulsory.

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

Q.No	Question	CO	Marks															
Q1	<p>The following data on consistency limits are available for two soils A and B.</p> <table><tr><td></td><td>Soil A</td><td>Soil B</td></tr><tr><td>Plastic Limit</td><td>16%</td><td>19%</td></tr><tr><td>Liquid Limit</td><td>30%</td><td>52%</td></tr><tr><td>Flow Index</td><td>11</td><td>6</td></tr><tr><td>Natural water content</td><td>32%</td><td>40%</td></tr></table> <p>Find which soil is</p> <p>(a) more plastic</p> <p>(b) better foundation material on remoulding</p> <p>(c) better shear strength as a function of water content</p> <p>(d) better shear strength at plastic limit</p> <p>(e) Classify the soil as per the Indian Soil Classification System</p>		Soil A	Soil B	Plastic Limit	16%	19%	Liquid Limit	30%	52%	Flow Index	11	6	Natural water content	32%	40%	2	5
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Q2	A saturated soil sample has a volume of 25 cm^3 at liquid limit. If the soil has a liquid limit and shrinkage limit of 42% and 20% respectively, determine the minimum volume which can be attained by the soil specimen. Take $G = 2.7$	2,3	6															
Q3	<p>A pycnometer test for determination of water content of a soil sample having $G = 2.70$ yielded the following data:</p> <p>Mass of moist soil = 230.75 gm</p> <p>Mass of Pycnometer full of water = 2965.20 gm</p> <p>Mass of Pycnometer + soil + water = 3092.85 gm</p> <p>Calculate the water content of the soil.</p>	1,2	6															
Q4	In reference to the Liquidity index (I_L) of soil, explain the variation of soil stress – strain behavior for $IL < 0$; $0 < I_L < 1$; $I_L > 1$	2	5															
Q5	What is capillarity in soil? Derive the expression for height of capillary rise (h_c) in soil.	2,3	3															