

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: B.TECH.
BRANCH: CIVIL**

**SEMESTER : V
SESSION : MO/2023**

SUBJECT: CE419 ADVANCED GEOTECHNICAL ENGINEERING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Briefly discuss the steps of soil exploration.	[5] 1	VI
Q.1(b)	Mention IS code numbers for the following tests - Standard penetration test, Static cone penetration test, Dynamic cone penetration test, Field Vane shear test, Seismic refraction test.	[5] 1	I
Q.2(a)	What are the different types of settlement ? Write a short note to explain above.	[5] 2	I
Q.2(b)	How to use Newmark's chart ? Draw and write expressions for Vertical pressure distribution on a vertical line.	[5] 2	I
Q.3(a)	(i) Arrange in increasing order of magnitude - earth pressure at rest, active earth pressure, passive earth pressure. (ii) For clay, sand, silt (a) Compare between the magnitude of values of coefficient of active earth pressure, (b) Compare between the magnitude of values of coefficient of passive earth pressure.	[5] 3	V
Q.3(b)	A retaining wall 6 m high supports earth with its face vertical. The earth is cohesionless with particle specific gravity 2.69, angle of internal friction 35° and porosity 40.5 %. The earth surface is horizontal and level with the top of the wall. Determine the active earth pressure and its line of action on the wall, if the earth is water logged to level 2.5 m below the top surface. Neglect wall friction. Draw the pressure distribution diagram.	[5] 3	V
Q.4(a)	(i) What are the different types of slope failure ? Draw figure. (ii) Write the use of stability number in design of slopes.	[5] 4	I
Q.4(b)	Write the steps of stability analysis of slopes for C - ϕ soil by Swedish slip circle method. Draw figures.	[5] 4	I
Q.5(a)	Compare the relative advantages and disadvantages of different shapes of wells.	[5] 5	II
Q.5(b)	How to rectify tilt and shift of wells ? Draw figures and explain.	[5] 5	V

:::24/11/2023:::M