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

CLASS: BTECH **SEMESTER : V/VII/ADD**
BRANCH: CIVIL **SESSION : MO/2025**

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.

			CO	BL
Q.1(a)	Briefly compare between different methods of soil exploration.	[5]	1	III
Q.1(b)	Draw neat sketches of the experimental set up of i) Seismic refraction, ii) Electrical resistivity test.	[5]	1	II
Q.2(a)	Draw contact pressure distribution for i) Saturated clay, ii) Cohesionless sand, iii) Intermediate soil under rigid footings.	[5]	2	II
Q.2(b)	The base of a tower consists of a equilateral triangular frame, on the corners of which three legs of the tower is supported. The total weight of the tower is 600 kN, which is equally carried by all the three legs. Compare the increase in the vertical stress in the soil caused at a point 5 m below one of the legs.	[5]	2	V
Q.3(a)	Write the assumptions of Rankine's theory of earth pressure.	[5]	3	II
Q.3(b)	A retaining wall 4 m high, has a smooth vertical back. The backfill has a horizontal surface in level with the top of the wall. There is uniformly distributed surcharge load of 36 kN/ m^2 intensity over the backfill. The unit weight of the backfill is 18 kN/m^2, its angle of shearing resistance is 30 degree and cohesion is zero. Determine the magnitude and point of application of active pressure per metre length of the wall.	[5]	3	V
Q.4(a)	Briefly discuss the causes of slope failure.	[5]	4	III
Q.4(b)	Explain the Swedish slip circle method of slope stability analysis for c – ϕ soil.	[5]	4	IV
Q.5(a)	Draw a neat sketch of vertical section of well foundation showing its different parts.	[5]	5	II
Q.5(b)	Briefly discuss the methods of vibration isolation.	[5]	5	III

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