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10CV64

Sixth Semester B.E. Degree Examination, June/July 2019
Geotechnical Engineering - II

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

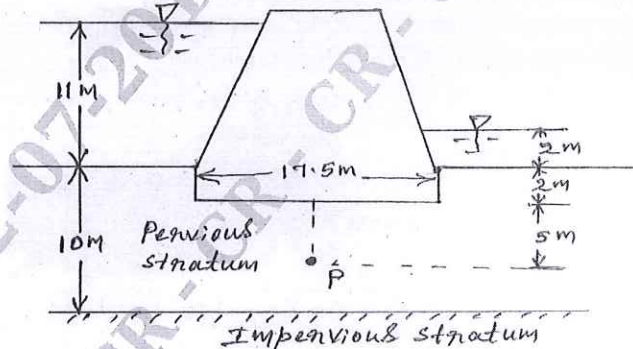
- 1 a. Discuss the objectives of dewatering. List the different methods of dewatering and explain any one of them with neat sketch. (10 Marks)
- b. By conducting a Seismic refraction study the following readings were obtained :

Time (sec)	0.1	0.2	0.3	0.4	0.45	0.50	0.55
Distance (M)	40	80	120	160	200	240	280

Geophones are placed at a spacing of 40m in a straight line and the time taken for the last wave to be received at each geophone is given , what is the velocities of wave in soil layers? What is the thickness of the top stratum? (10 Marks)

- 2 a. Explain the concept , procedure of construction and advantages of Newmark chart. (10 Marks)
- b. A rectangular footing 2.4m × 2.0 carries a uniformly distributed load of 320 kN/m². Find the intensity of vertical pressure at a depth of 4.2m below the centre of the footing using Boussinesq equivalent point load method (10 Marks)
- 3 a. Explain with neat sketch a method of locating the phreatic line in a homogeneous earth dam with horizontal filter. (08 Marks)
- b. A concrete dam fig. Q3(b) 17.5m base retains water to a level of 11.0m on the upstream. The water level on the downstream is 2.0m. The impervious stratum is 10.0m below the dam. The coefficient of permeability $K = 1 \times 10^{-6}$ m/sec. If dam is 50m long compute total quantity of seepage flow per day below the dam. Also compute seepage pressure at point P, 5m below the center of the dam. (12 Marks)

Fig.Q3(b)



- 4 a. Explain Rebhann's graphical method for determining active earth pressure on the basis of Coulomb's theory. (08 Marks)
- b. A retaining wall of height 10m supports cohesionless soil with following properties : $G = 2.65$; $e = 0.65$ and $\phi = 30^\circ$. The water table lies at 3m depth. The surface of back fill is horizontal and carries uniform surcharge of intensity 14kN/m². Determine total active earth pressure and its point of application. Also draw lateral active earth pressure distribution diagram. (12 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART - B

- 5 a. Discuss the stability of finite slope by Swedish method of slices for a cohesive frictional soil. (06 Marks)
- b. Explain the Felineous method for stability analysis of slopes. (06 Marks)
- c. An embankment is to be constructed with a soil having $C = 20\text{kN/m}^2$; $\phi = 10^\circ$ and $\gamma = 19\text{kN/m}^3$. The desired factor of safety with respect to cohesion as well as friction is 1.5. Determine
- i) Safe height of the desired slope if slope is 2H to 1V.
- ii) Safe angle of slope if the desired height is 15. For $\phi = 10^\circ$ stability numbers are as follows : (08 Marks)

Stability No.	0.04	0.08
Slope angle	20°	30°

- 6 a. List the factors influencing bearing capacity of soil. (04 Marks)
- b. Explain standard penetration test and its corrections. (08 Marks)
- c. A strip footing 2m wide carries a load intensity of 400 KPa at a depth of 1.2m in sand. The saturated unit weight of sand is 19.5 kN/m^3 and unit weight above water table is 16.8kN/m^3 . If $C = 0$ and $\phi = 35^\circ$, determine the factor of safety with respect to shear failure for the following locations of water table.
- i) Water table is 4m below ground level.
- ii) Water table is 1.2m below ground level. (08 Marks)
- 7 a. Write a note on settlement of footings. (10 Marks)
- b. A saturated clay 8m thick underlies a proposed new building. The existing overburden pressure at the centre of clay length is 300KPa and load due to a new building increases the pressure by 200 KPa. The liquid limit of the soil is 75%. Water content of soil is 50% and the specific gravity of soil is 2.7. Estimate consolidation settlement. (10 Marks)
- 8 a. Explain the factors affecting the choice of foundation. (06 Marks)
- b. Discuss the proportioning of isolated footing. (06 Marks)
- c. Explain determination of the pile load capacity. (08 Marks)

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