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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Sixth Semester, B.E. - Civil Engineering

Semester End Examination; June/July - 2015

Geotechnical Engineering - II

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.*

PART - A

1 a. List objectives of soil Exploration. 6

b. Discuss Wash boring technique. 7

c. Define: i) Borelog ii) Critical distance iii) Inside clearance iv) Area ratio v) Disturbed samples vi) Recovery ratio vii) Significant depth. 7

2. a. List various methods of dewatering techniques and their suitability. 4

b. Explain Multistage well point system along with a neat sketch. 6

c. Discuss pumping out test in an Unconfined aquifer. 6

d. Explain Hvorslev's method of determination of position of ground water table. 4

3 a. State the assumptions of Boussinesq theory and Westergaard's theory. 3

b. In an industrial area there is a surface loaded circular silo of 30 m diameter carrying a load intensity of 150 kPa. Find the intensity of vertical stress at depth of 5 m and 10 m below ground level along central axis of silo. Use Boussinesq theory. 6

c. With a neat sketch, Explain New Marks chart its usage and limitation. 11

4 a. Define flow nets. What are the characteristics of flownet. Explain their uses. 8

b. An Earthen Dam made of a homogeneous material has following data: Horizontal filter of 25 m is provided inward from downstream toe of the dam Fig Q. 4(b)

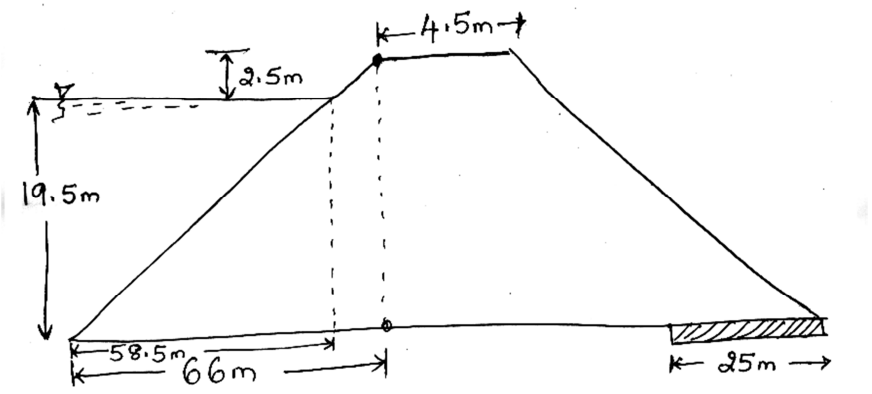

Fig Q. 4(b) 12

Perform necessary calculations to obtain a phreatic line and plot the phreatic line.

PART – B

5 a. List the assumptions made in Rankine's Earth pressure theory with Coulomb's Earth pressure theory. 3

b. Discuss Rebhann's graphical method. 5

c. A 5 m high retaining wall has cohesive backfill with C = 5 kN/m^2, $\phi = 30^\circ$, $\gamma = 17.5$ kN/m^3. Determine active Earth pressure before and after formation of crack. Find location of resultant pressure. Draw pressure diagram indicating the magnitude of pressures acting. 12

6 a. Explain different types of slope failures. 5

b. Define factor of safety of slopes. Bring out the different factors of safety in analyzing stability of slopes. 5

c. Explain friction circle method of analysis of slopes. 10

7 a. Differentiate general shear and local shear failure. 5

b. List Terzaghi's bearing capacity theory assumptions and limitations. 6

c. A foundation 2 m x 2 m is at a depth of 1.2 m on Sandy soil with $\gamma = 17.7$ kN/m^3. Properties of soil are C = 0 $\varphi = 30°$. Take $N_q = 22$. $N_\gamma = 20$. Find safe bearing capacity for:
i) W.T. at Ground level ii) W.T. at base of footing.
Take $\gamma = 16$ kN/m^3; $\gamma_{sat} = 17.7$ kN/m^3. Assume of safety = 3. 9

8 a. Discuss different types of settlement. 8

b. A clay layer whose total settlement under a given loading is expected to be 12 cm settles 3 cm at the end of One month after application of load increment. How many months will be required to reach a settlement of 6 cm? How much settlement will occur in 10 months? Assume double drainage and degree of consolidation as 25% & 50%. 12

μ	25	45	55	65	75	85
τ_v	0.0492	0.159	0.238	0.342	0.477	0.684

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