

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: 160606****Date: 08-12-2014****Subject Name: Geotechnical Engineering-II****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Describe culmann's method for the stability analysis of homogeneous slopes. What are its limitation ? **07**
- (b) A new canal is excavated to a depth of 5m below ground level through a soil having the following characteristics:  $c = 14 \text{ kN/m}^2$ ,  $\phi = 15^\circ$ ,  $e = 0.8$  and  $G = 2.70$ . the slope of banks is 1 in 1. Calculate the factor of safety with respect to cohesion when the canal runs full. If it is suddenly and completely emptied, what will be the factor of safety? **07**
- Q.2** (a) A retaining wall 9 m high retains a cohesionless soil, with an angle of internal friction  $33^\circ$ . The surface is level with the top of the wall. The weight of the top 3 m of the fill is  $21 \text{ kN/m}^3$ . Find the magnitude and point of application of the resultant active thrust. **07**
- (b) Discuss the various landslides remedial measures. **07**
- OR**
- (b) Determine the safe bearing capacity of a strip footing 1.5m wide and 1.5m depth resting on a dry sand bed. Consider ( $\gamma_{\text{sand}} = 18 \text{ kN/m}^3$  and bearing capacity factors  $N_c = 35.5$ ,  $N_q = 23.2$ ,  $N_\gamma = 22.0$ , corresponding to  $\phi = 38^\circ$  and factor of safety = 3). **07**
- Q.3** (a) State functions of foundation. State the causes of failure of foundation. Explain any one method of improving bearing capacity of soil. **07**
- (b) Differentiate between finite and infinite slopes. **07**
- OR**
- Q.3** (a) Enlist factor affecting the bearing capacity and explain any two in detail. **07**
- (b) What is a stability number? What is its utility in the analysis of stability of slopes? **07**
- Q.4** (a) What is coulomb's wedge theory? Compare Rankine's theory and coulomb's theory. **07**
- (b) Describe " Negative skin friction" **07**
- OR**
- Q.4** (a) Explain Swedish circle method of stability analysis. **07**
- (b) What are the different types of earth pressure? Give examples. **07**
- Q.5** (a) What is pressure bulb? Explain its use. **07**
- (b) Discuss the Electric Resistivity Method for sub soil Investigation. **07**
- OR**
- Q.5** (a) Elaborate the conditions where a pile foundation is more suitable than a shallow foundation. **07**
- (b) Differentiate between General shear failure and local shear failure with neat sketch. **07**

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