

BENGAL ENGINEERING AND SCIENCE UNIVERSITY, SHIBPUR
M.E. (Civil) 1st Semester Final Examination, Dec 2011
Sub: Principles and Design of Reinforced Earth (CE 927)
Assume reasonable data if not supplied
Answer any Five Questions

Full Marks: 70

Time: 3 hours

- Q.1. (a) Explain the term 'Reinforced Earth'. How does the reinforcement affect on the strength of soil? Explain with the help of Mohr-Coulomb envelope.
(b) Explain the anisotropic cohesion concept in the light of the tests results of LCPC.

(8 + 6 = 14)

- Q.2. Deduce the expressions for predicting forces in reinforcement strips in case of reinforce earth walls by which of the following methods: (i) Coulombs method, and (ii) Rankine's method.

(14)

- Q.3.(a) Write short notes no: Maximum tension line, Active zone, Resisting zone and Types of failure of reinforcing element in a reinforced earth wall.

- (b) Describe the trapezoidal tear test of geotextile with neat sketches.

(6 + 8 = 14)

- Q.4. (a) Describe the falling head cross plane permeability test method for geotextile with neat sketches.

- (b) Given the following constant head data set for radial flow of water in a 1.0 mm thick geotextile that has a 60 mm outer radius and 30 mm inner radius, calculate the transmissivity and planner coefficient of permeability.

Δh (cm)	1.27	2.54	3.81	5.08
q (cm^3/sec)	24	49	75	99

- (c) Discuss the limitation of the AOS test

(7 + 4 + 3 = 14)

- Q.5. (a) Write short notes on SIGMA model.

- (b) Describe with net sketches the following applications of geotextiles used adjacent to the soil for the purpose of filtration:

- (i) Geotextiles behind retaining walls, (ii) Geotextiles wrapped around under drains, (iii) Geotextiles used beneath erosion control structure.

(5 + 9 = 14)

- Q.6. (a) Discuss the various factors that influence the bearing capacity of footing on reinforced soil.

(14)

- Q.7. (a) Describe the test procedure of CBR push through test for geotextile with neat sketches.

- (b) Give the following set of data from soil geotextile friction test,

Normal Stress (kPa)	45	90	180	360
Shear strength (kPa)	25	50	100	200

- (i) Plot the Mohr failure envelope

- (ii) Obtain the friction angle.

- (iii) Calculate the fabric efficiency based on the soil friction angle 38°

(8 + 6 = 14)