



Q1. Descriptive and objective type.

- 1-1 What is Mohr-Coulomb’s strength theory? Sketch typical drawing for this criteria?
- 1-2 Describe direct shear box test?
- 1-3 Describe the triaxial shear test?
- 1-4 Describe unconfined (uniaxial) compression test?
- 1-5 Derive the relationship between the inclination of the plane of failure and the angle of shearing resistance.
- 1-6 Derive expression for the normal and shear stresses on the plane of failure in terms of the principal stresses.

Q2. Numerical

2-1 the principal stresses at a point in a material are 80 KN/m<sup>2</sup> and 40 KN/m<sup>2</sup>. Determine the normal stress, shear stress and resultant of stresses on a plane inclined at 30° to the major principal plane.

2-2 a series of direct shear tests was conducted on a rock samples, each test was carried out till the sample failed. The following results were obtained.

Sample No.	Normal stress kN/m <sup>2</sup>	Shear stresses kN/m <sup>2</sup>
1	100	100
2	300	300
3	500	500

Based on the previous results, determine the shear strength parameters?

2-3 the following results were obtained from a series of triaxial test on rock samples. Draw these results then find the shear strength parameters for this rock.

Sample No.	Confining pressure kN/m <sup>2</sup>	Deviator stress at failure kN/m <sup>2</sup>
1	100	600
2	200	750
3	300	870

2-4 in an unconfined (uniaxial) compression test , the following data were collected ( sample height = 7.6cm , sample diameter = 3.8cm )

Load ( kg)	0	2	6	10	14	16	11	9
Dial reading (cm)	2.00	1.987	1.966	1.947	1.920	1.889	1.700	1.650
	0							

Find the uniaxial compressive strength for the tested specimen.

2-5 the following results were obtained form shear box tests on a specimen of clayey silt

Normal stress (t/m <sup>2</sup> )	21.4	32.1	42.8
Shear stress (t/m <sup>2</sup> )	11.8	14.6	17.3

Find the cohesion and the angle of shearing resistance.

With My Best Wishes

Dr. Mohammed Hussien ----- Fayoum in 11-2014