



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of BUILDING & Civil engineering
UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING
DCE 2106: GEOTECHNOLOGY I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: JULY 2025
TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, Calculator, examination pass and student ID

This paper consists of five questions.

Attempt any THREE questions.

Do not write on the question paper.

QUESTION ONE (20 Marks)

- a) Briefly explain FIVE areas of importance of Soil Mechanics in building and civil engineering. (10 Marks)
- b) Describe the FIVE types of transported soils. (10 Marks)

QUESTION TWO (20 Marks)

- a) A laboratory test was carried out on a soil sample of specific gravity 2.65. The following results were obtained:

Mass of wet soil = 19.6 kg

Mass of dried soil = 16.0 kg

Calculate:

- i) Saturated density of the sample
- ii) Porosity
- iii) Void ratio
- iv) Degree of saturation.

(10 Marks)

- b) Describe the procedure for carrying out field bulk density test.

(10 Marks)

QUESTION THREE (20 Marks)

- a) The results of a sieve analysis on a soil sample are given in Table 1. If the total mass of sample was 311g, plot the particle size distribution curve on chart 1. From the curve, describe the soil and give the group symbol of classification.

TABLE 1

SIEVE SIZE (mm)	MASS RETAINED (g)
50	0
37.5	15.5
20	17
14	10
10	11
6.3	33
3.35	114.5
1.18	63.3
0.6	18.2
0.15	17
0.063	10.5

(12 Marks)

- b) Describe the procedure for carrying out liquid limit test using Casagrande apparatus.

(8 Marks)

QUESTION FOUR (20 Marks)

- a) The following results of a compaction test are given in Table 2.

TABLE 2

Moisture Content (%)	13	14	15	16
Bulk Density (Kg/m ³)	2043	2100	2120	2117

- i) Plot the compaction curve
 - ii) Determine the maximum dry density
 - iii) Determine the optimum moisture content (14 Marks)
- b) Outline FOUR factors that affect compaction. (6 Marks)

QUESTION FIVE (20 Marks)

- a) Briefly explain the method used to distinguish intrusives from extrusives on a site. (4 Marks)
- b) With aid of a sketch, describe a Batholith. (6 Marks)
- c) (i) Describe sedimentary rocks. (2 Marks)
- (ii) Briefly explain the process of formation of sedimentary rocks. (2 Marks)
- d) Briefly explain SIX factors that influence the degree of alteration attained during Metamorphism. (6 Marks)

