

Total No. of Question : [4]

Registration No. : 

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**Programme Name : Bachelor of Civil Engineering**  
**Regular S.Y.B.Tech.Sem.IV ESE May / June 2023**  
**IV SEMESTER ( 2021 BATCH)**  
**201CEL212-Geotechnical Engineering**

Duration : 2 Hours

Marks : 50

Instructions :

(Q1) All Questions are compulsory. [20.0]

(1.1) Explain in detail pycnometer method for determination of specific gravity of soil as per IS 2720. Also give range for typical soils. [6.0]

CO :- C212.1

Blooms Taxonomy :- Understand

(1.2) Explain three phase and two phase system of soil with neat sketch. [7.0]

CO :- C212.1

Blooms Taxonomy :- Understand

(1.3) Following data refers to compaction test as per standard proctor test. Calculate MDD & OMC. [7.0]

G = 2.7. V= 950cc.

W (%)	12	14	16	18	20	22
wet soil mass(g)	1680	1850	1910	1870	1870	1850

CO :- C212.2

Blooms Taxonomy :- Apply

(Q2) Solve any TWO questions. [10.0]

(2.1) Enlist all field and lab methods for determination of shear strength. Which of the shear tests simulate the field conditions more appropriately? [5.0]

CO :- C212.1

Blooms Taxonomy :- Understand

(2.3) Write short note on "Pressure bulb" [5.0]

CO :- C212.1

Blooms Taxonomy :- Understand

(2.3) Table gives observations for normal load and maximum shear force for the specimens of sandy clay tested in shear box, 6cm x6cm, under undrained condition. Plot the failure envelope for the soil and determine the values of apparent angle of shearing resistance and apparent cohesion. [5.0]

Normal load(N)	100	200	300	400
Maxi. shear force(N)	110	152	193	235

**CO :- C212.2**

**Blooms Taxonomy :- Apply**

(Q3) Solve any TWO questions. [10.0]

(3.1) Explain coefficient of active, passive and rest earth pressure. [5.0]

**CO :- C212.3**

**Blooms Taxonomy :- Apply**

(3.2) A concentrated load 2000 kN acts on the surface of a soil mass. Use Bounssinesq's analysis. Find the vertical stress at 6m exactly below load and at a radial distance of 5m from the axis of loading and at 6m below ground level. [5.0]

**CO :- C212.3**

**Blooms Taxonomy :- Apply**

(3.3) Draw and explain active pressure distribution diagram for retaining wall with dry cohesionless soil without water table. [5.0]

**CO :- C212.3**

**Blooms Taxonomy :- Apply**

(Q4) Solve any TWO questions. [10.0]

(4.1) Give the classification of shear test based on 'Drainage Condition' with meaning of each terms. [5.0]

**CO :- C212.1 , C212.2**

**Blooms Taxonomy :- Understand, Apply**

(4.2) Give all factors affecting Shear Modulus, Elastic Modulus and Elastic Constants [5.0]

**CO :- C212.1**

**Blooms Taxonomy :- Understand**

(4.3) Write a short note on soil improvement to mitigate seismic hazards [5.0]

**CO :- C212.1**

**Blooms Taxonomy :- Understand**

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