Roll No _____

Script No.

SINDH BOARD OF TECHNICAL EDUCATION KARACHI

DIPLOMA OF ASSOCIATE ENGINEER 3rd YEAR

MODEL PAPER FOR

ANNUAL EXAMINATION 2021

Technologies: CIVIL

SUBJECT: CT-373 SOIL MECHANICS, HIGHWAYS & AIRPORTS

SECTION "A" OBJECTIVE

TIME: 40 Minutes
MAX. MARKS: 50

Instructions:

- Attempt all questions.
- All questions carry equal marks.
- Question paper must be returned back to invigilator within the scheduled time.

Q1. (a) Fill in the blanks **Max Marks 20**

1. _____ soil called glacial soil which is transported and deposited by glacises.
2. Size of silt particles varies from _____mm to _____mm.
3. Soil particle of 0.001 mm or less is called _____.
4. Unit of moisture content is _____.
5. Void ratio = _____.
6. Soil particle less than 0.005 mm is called _____.
7. Porosity is the ratio between volume of voids to _____.
8. In dry soil, quantity of water is _____.
9. Consistency limits are also called _____ limits.
10. _____ material is most resistance against slope failure.

Q1. (b) Encircle "T" for True and "F" False. **Max Marks 15**

1. The limit at which soil changes from plastic state to semi solid state is terned as plastic limit (T / F).
2. Size of gravel is defined in mm as 4.75 – 76.2 (T / F).
3. Void ratio 'e' is determined in a soil sample by Vv. (T / F).
4. Determining liquid limit of soil, depth of groove is 10 (T / F).
5. Boundless are layers fragments, size bigger than 80mm (T / F).
6. Number of layers of soil adopted in standard proctor test are 5 (T / F).
7. Weight of rammer in case of standard proctor test is 101bs (T / F).
8. Optimum moisture content for compaction for various soil range 8-12% (T / F).
9. According to dare cay's law Discharge = Q=Kvi (T / F).
10. Value of internal frictional angler is zero in case of day (T / F).
11. Drop fall of rammer in case of modified proctor test is 18 in (T / F).
12. Most stable angle against slope is flat (T / F).
13. A method of strengthening of slope is pitching (T / F).
14. Normally value of factor of safety adopted is 3 (T / F).
15. Bearing capacity of soil at which soil is likely to be failed is termed as ultimate bearing capacity (T / F).

Q1. (c) Multiple Choice questions **Max Marks 15**

1. Size of sand is defined in mm as.
   (a) 4.75-76.2 (b) 0.2-4.75 (c) 0.002-0.2 (d) 76.2-102.5

2. Degree of saturation is expressed as
   (a) $\frac{Vv}{}$ (b) $\frac{Vv}{}$ (c) Vw (d) Vw

3. Plasticity index is equal to.
   (a) P.L – L.L (b) L.L P.L (c) P.L+L.L (d) L.L P.L

4. Determining liquid limit number of blows are standardized.
   (a) 10 (b) 15 (c) 20 (d) 25

5. The best material for foundation.
   (a) Clay (b) Laom (c) Silt (d) Sand

6. In the result of compaction, relieving element is
   (a) Air (b) Water (c) Both air & water (d) None of these

7. The ratio between ultimate bearing capacity & safe bearing
   (a) Design ratio (b) bearing ratio (c) design factor (d) factor of safety

8. Effect of sheet piles driven on the toe of a slope.
   (a) Stable (b) non stable (c) no effect (d) dangerous

9. If the slip circle passes above the toef a slope then the failure is termed as.
   (a) Toe failure (b) slope failure (c) base failure (d) non of these

10. Shearing strength of soil depends upon.
    (a) Cohesion (b) inter – locking (c) size & shape

11. Colum's law is applicable for such soil
    (a) C-soil (b) ϕ- soil (c) c-ϕ soil (d) all of these

12. Failure plane in case of shear box text is always.
    (a) Horizon (b) vertical (c) inclined (d) anyone

13. According to darcay's law, relation of velocity and hydraulic gradient is
    (a) $V \propto i$ (b) $V \propto 1/i$ (c) $V = i$

14. Relation between hydraulic gradient 'i' head 'h' and length of soil sample 'L'
    (a) i= h.L (b) i= h/L (c) i= L/h (d) $i \propto h.L$

15. which soil is called as c-soil
    (a) Sand (b) grand (c) clay (d) granular soil

Signature of Candidate	Seal of Examination Centre	Signature of Invigilator

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SECTION "B" & "C"

TIME: 2.40 HOURS **MAX. MARKS: 50**

Section "B" **(Short Answer Questions)** **Max. Marks: 30**

Q2: Attempt any Six questions from the following. All questions carry equal marks.

1. Define void ratio, porosity and moisture content.
2. Describe three phase diagram of soil.
3. Define liquid limit, plastic limit, and shrinkage limit and plasticity index.
4. Describe the textural classification system of soil.
5. Enlist various system of soil classification.
6. Describe the factors affecting the soil compaction.
7. State the comparison between compaction and consolidation.
8. Define permeability and constant of permeability.
9. State the factors contributing to failure of slopes.
10. Define bearing capacity, ultimate bearing capacity and safe bearing capacity of soil.

Section "C" (Descriptive Answer Questions) Max. Marks: 20

Q3: Attempt all questions from the following. All questions carry equal marks.

1. Describe the alter berg limits & explain the methods of determining these limits.

   OR

   Describe liquidity index and consistency index.

2. Name various system of soil classifications and explain one of them

   OR

   Explain in detail core cutter method.

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