

Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2018
CE2CO07 Geo Technique Engineering

Programme: Diploma

Branch/Specialisation: CE

Duration: 3 Hrs.**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. In oven drying method usually the soil sample is kept for: **1**
 (a) 72 hrs at 200°C to 250°C. (b) 24 hrs at 105°C to 110°C.
 (c) 24 hrs at 200°C to 250°C. (d) 72 hrs at 115°C to 250°C.
- ii. Find out the correct relation: **1**
 (a) $e = V_v / V_s$ (b) $e = V_w / V_s$
 (c) $e = V_v / V_w$ (d) $e = V_a / V_s$
- iii. The effective diameter size is: **1**
 (a) D_{10} (b) D_{60} (c) D_{30} (d) D_{20}
- iv. The minimum water content at which the soil just begins to crumble when rolled into threads 3 mm in diameter, is known
 (a) Liquid limit (b) Plastic limit
 (c) Shrinkage limit (d) Permeability limit.
- v. The equipotential lines and flow lines generally meet at: **1**
 (a) 30° (b) 45° (c) 60° (d) 90°
- vi. The quantity of seepage of water through soils is proportional to **1**
 (a) Coefficient of permeability of soil
 (b) Total head loss through the soil
 (c) Neither (a) nor (b)
 (d) Both (a) and (b)
- vii. The maximum pressure which a soil can carry without shear failure, is **1**
 called:
 (a) Safe bearing capacity
 (b) Net safe bearing capacity
 (c) Net ultimate bearing capacity
 (d) Ultimate bearing capacity.

[2]

- viii. Cohesion less soil is: **1**
(a) Sand (b) Silt (c) Clay (d) Silt and clay
- ix. Compression of soil occurs rapidly if voids are filled with **1**
(a) Air
(b) water
(c) Partially air and partially water
(d) None of these
- x. The consolidation time for soils **1**
(a) Increases with increasing compressibility
(b) Decreases with increasing permeability
(c) Increases rapidly with increasing size of soil mass
(d) All of these
- Q.2 i. Explain Three Phase system of soil with diagram. **2**
ii. What do you understand by term specific gravity, write down methods of determination of specific gravity. **3**
iii. Explain following terms : **5**
(a) Void ratio (b) Porosity
(c) Degree of Saturation (d) Density Index
(e) Water Content
- OR iv. Write down various types of unit weight of soil mass. **5**
- Q.3 i. Explain following terms: uniformity coefficient and coefficient of curvature. **2**
ii. What is Stoke's Law? Discuss its assumptions. **3**
iii. Explain Atterberg's limits of consistency in detail. **5**
- OR iv. Discuss IS classification of soil. **5**
- Q.4 i. Explain Darcy's Law of permeability. **2**
ii. What do you understand by terms permeability and coefficient of permeability. Explain factors which affect permeability. **8**
- OR iii. Describe Flow net. Discuss characteristics of flow net in detail. **8**
- Q.5 i. Describe ultimate bearing capacity and safe bearing capacity. **4**
ii. Explain Terzaghi's Analysis and its assumption. **6**
- OR iii. Explain Rankine's theory and its assumption. **6**

[3]

- Q.6 Attempt any two:
- i. Explain zero voids line, and also describe optimum moisture content and maximum dry density. **5**
- ii. What do you mean by stabilization? Explain its type. **5**
- iii. Explain California Bearing Ratio and California Bearing Ratio test in detail. **5**

Marking Scheme

CE2CO07 Geo Technique Engineering

Q.1	i. In oven drying method usually the soil sample is kept for: (b) 24 hrs at 105°C to 110°C.	1			
	ii. Find out the correct relation: (a) $e = V_v / V_s$	1			
	iii. The effective diameter size is: (a) D_{10}	1			
	iv. The minimum water content at which the soil just begins to crumble when rolled into threads 3 mm in diameter, is known (b) Plastic limit	1			
	v. The equipotential lines and flow lines generally meet at: (d) 90°	1			
	vi. The quantity of seepage of water through soils is proportional to (d) Both (a) and (b)	1			
	vii. The maximum pressure which a soil can carry without shear failure, is called: (a) Gross Safe bearing capacity	1			
	viii. Cohesion less soil is: (a) Sand	1			
	ix. Compression of soil occurs rapidly if voids are filled with (a) Air	1			
	x. The consolidation time for soils (d) All of these	1			
Q.2	i. Three Phase system of soil Definition and description	2	1 mark		
	Diagram		1 mark		
	ii. Definition of specific gravity Methods of determination (Any two)	3	2 marks		
	iii. Each definition with formula (a) Void ratio (b) Porosity (c) Degree of Saturation (d) Density Index (e) Water Content	5	(1 mark * 5)		
OR	iv. For five types of unit weight of soil mass For each definition with formula	5	(1 mark * 5)		
Q.3	i. Uniformity coefficient definition with formula Coefficient of curvature definition with formula	2	1 mark		
	ii. Stroke's Law description with formula Its assumptions (max 2)	3	2 marks		
	iii. Atterberg's limits i.e Liquid limit, plastic limit and shrinkage limit. For each definition with formula 1 mark (1 mark * 3) Graph of consistency limit	5	1 mark.	3 marks	
OR	iv. IS classification of soil Diagram	5	3 marks	2 marks	
Q.4	i. Darcy's Law of permeability. ii. Permeability Coefficient of permeability Factors which affect permeability (max 5 with description). 1 mark each (1 mark * 5)	8	1.5 marks	1.5 marks	
OR	iii. Flow net with diagram Any 5 characteristics of flow net 1 mark each	8	3 marks	5 marks	
Q.5	i. Definition ultimate bearing capacity Safe bearing capacity. ii. Terzaghi's Analysis For its assumption.(max 4)	6	2 marks	2 marks	
OR	iii. Rankine's theory For its assumption.(max 4)	6	4 marks	2 marks	
Q.6	Attempt any two: i. Zero voids line Definition optimum moisture content Definition maximum dry density ii. Definition of stabilization Its types (max 4). iii. Definition of California Bearing Ratio California Bearing Ratio test	5	2 marks	1.5 marks	1.5 marks
			1 mark	4 marks	5
			1 mark	4 marks	5
