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C16-C-503

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**BOARD DIPLOMA EXAMINATION, (C-16)**

**JUNE/JULY—2022**

**DCE - FIFTH SEMESTER EXAMINATION**

**GEOTECHNICAL ENGINEERING**

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define (a) cohesion and (b) plasticity.
2. Write the need for soil exploration.
3. Define (a) liquid limit and (b) shrinkage limit.
4. What do you understand by the term 'shear strength of soil'?
5. Define the terms (a) net ultimate bearing capacity and (b) safe bearing capacity.
6. Write the equation for finding the ultimate bearing capacity of soils.
7. Define the term settlement and write any two causes for foundation settlement.
8. Define the principle of consolidation.
9. State any three objectives of compaction.
10. Write any three factors affecting compaction.

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**PART—B**

10×5=50

- Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** Explain the method of dry sieve analysis of soils.
- 12.** Explain the laboratory procedure to determine plastic limit of soil.
- 13.** (a) Define the terms (i) plasticity index and (ii) plastic limit.  
(b) A moist soil sample weighs 352 g. After drying, its weight is reduced to 290 g. The specific gravity of solids is 2.65 and the bulk density of soil is 18.5 kN/m<sup>3</sup>. Determine (i) water content, (ii) dry density and (iii) void ratio. Take unit weight of water as 10 kN/m<sup>3</sup>.
- 14.** Explain the textural classification of soil with a neat sketch.
- 15.** (a) Describe briefly the ground water exploration.  
(b) Describe the direct shear test experiment.
- 16.** Explains the field plate load test for determining the ultimate bearing capacity of soils.
- 17.** (a) Describe briefly the importance of settlement in building foundations.  
(b) Explain the Terzaghi's model analogy of compression springs, showing the process of consolidation.
- 18.** Explain the field measurement of compaction by sand replacement method.

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