

**Roll No.**

**Total No. of Pages : 02**

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**M.Tech.(Soil Mechanics & Foundation Engg.) (Sem.-2)**

# APPLIED SOIL MECHANICS

**Subject Code : CESE-4**

**M.Code : 37212**

**Date of Examination : 20-12-22**

**Time : 3 Hrs.**

**Max. Marks : 100**

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT.
2. Each question carries TWENTY marks.

1.
  - a) Enumerate the important methods which are generally used for analyzing stability of slopes of embankments. Discuss in detail, any one of those methods.
  - b) Find the critical angle of an infinite slope in a dry clay soil having  $c' = 20 \text{ kN /m}^2$ ,  $\phi' = 20 \text{ degree}$ ,  $G_s = 2.72$  and  $e = 0.9$ .
2.
  - a) What is the significance of a filter in an earth dam? Discuss the design criteria of filters.
  - b) A Company 'ABC' has appointed you as Engineer-in-Charge for a site where dam is to be constructed. Discuss the problems along with their solutions, which you are likely to face during execution of construction of dam.
3.
  - a) Describe in detail the various stages in well point system of dewatering. Show neat sketches to illustrate your answer.
  - b) What is cement stabilization? Explain the factors affecting the cement stabilization for the soil.
4.
  - a) Define arching of soils. Explain any one theory associated with arching in detail. Give examples.
  - b) What are different types of conduits? How would you determine the load on a buried conduit due to surface loads?
5.
  - a) What is an expansive soil ? Give typical range of values of liquid limit, shrinkage limit and plasticity index for black cotton soil of our country.

- b) Define freezing index. What is the difference in the behavior of coarse grained soil and fine grained soil with regard to freezing?
- 6. Draw the apparent earth pressure design diagrams recommended by Terzaghi and Peck for cuts in sand, firm clay, soft to medium clay. In what respects does the design of bracings in cuts vary from that of a retaining wall?
- 7. a) What is a geothermal profile? What are its applications to Civil Engineers?  
b) Explain the role of nature of embankment soil on the cracking phenomenon of embankments.
- 8. Discuss the following :  
a) Depth of frost penetration  
b) Role of grouting in checking the foundation failures.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**