

Roll No.

Total No. of Pages : 01

Total No. of Questions : 08

M.Tech.(Soil Mechanics & Foundation Engg.) (2016 & Onwards)

(Sem.-2)

**APPLIED SOIL MECHANICS**

Subject Code : CESE-4

M.Code : 37212

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 methods which are generally used for analysis of stability of slopes of embankments. Discuss any one in detail. (15)  
b) An excavation is made with a vertical face in a clayey soil which has  $C_u = 50 \text{ kN/m}^2$ ,  $r_t = 18 \text{ kN/m}^3$ . Determine the maximum depth of excavation so that excavation is stable. Take Taylor's stability number = 0.261. (5)
2. a) Write in brief about Sloughing. (4)  
b) The relative compaction of sand in the field is 94.6%. The maximum and minimum dry densities are  $17.00 \text{ kN/m}^3$  and  $15.00 \text{ kN/m}^3$ . For field conditions, evaluate dry unit weight. (8)  
c) List various methods of applying compaction to an embankment in the field. (8)
3. a) Discuss conditions under which chemical stabilization is resorted to by Geotechnical Engineers. (8)  
b) Describe in detail the various stages in well point system of dewatering. Illustrate your answer with sketches. (12)
4. a) What do you mean by Arching of Soils? Give examples. (6)  
b) Draw a sketch showing the stress distribution in soil around tunnels. (8)  
c) What are different types of conduits? (6)

5. a) What is an expansive soil? Give typical range of values of liquid limit, shrinkage limit & plasticity index for black cotton soil of our country. (8)
- b) Explain the terms free Swell & Swelling pressure. How these parameters are determined for given soil samples in the laboratory. (12)
6. a) How is stability of the braced system ensured against heaving of the bottom? (8)
- b) Define 'Apparent earth pressure' w.r.t. open cuts. (6)
- c) Draw apparent earth pressure diagram for cuts in clay. (6)
7. a) What is Freezing Index? Write in detail about determination of depth of frost penetration. (12)
- b) "*Filled up areas should be best avoided as building sites.*" Comment. (8)
8. Write short note on :
- a) Geothermal Profile (10)
- b) Design of underground culverts. (10)

**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.**