Total No. of Questions : 10]

SEAT No :

P2148

[Total No. of Pages : 2

[5059]-513
B.E.(Civil)
ADVANCED GEOTECHNICAL ENGINEERING
(2012 Pattern) (401005E) (Semester - I) (End Sem.) (Elective - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3, or Q.4, Q.5or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary and mention it clearly.***
5) ***Use of non-programmable calculator is allowed.***

Q1) a) Explain how soils are classified according to IS soil classification system. **[3]**

b) Explain different clay minerals and their structural composition. **[4]**

c) Discuss the various primary and secondary bonds in respect of clay minerals. **[3]**

OR

Q2) a) Derive the relation for coefficient of lateral earth pressure at rest condition. **[3]**

b) Explain the steps for design of cantilever sheet pile wall. **[4]**

c) Write a note on anchored sheet pile wall. **[3]**

Q3) a) Differentiate between Rankine's and Coulomb theory of earth pressure. **[3]**

b) Explain Culman's graphical method. **[4]**

c) Determine the critical height of excavation of a vertical cut in cohesive soil if $C=20KN/m^2$ and $\gamma=15KN/m^3$ **[3]**

OR

Q4) a) Explain in short function of Geosynthetics. **[3]**

b) State the properties and functional requirements of Geosynthetics. **[3]**

c) Write a note on **[4]**

i) Mechanism of reinforced soil.

ii) Slope stabilization using soil nails.

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Q5) a) State the different properties relevant for dynamic loading and explain any one with detail. **[6]**

b) Describe elastic half space method in machine foundation. **[6]**

c) Write a note on 'Design criteria for machine foundation'. **[6]**

OR

Q6) a) Why is shear modulus a soil property of interest on soil dynamics? **[6]**

b) State the design procedure for a block foundation for cyclic loading. **[6]**

c) Define the following term. **[6]**

i) Natural Frequency

ii) Period

iii) Resonance

iv) Degree of Freedom.

Q7) a) What is the purpose of sand drain? And also explain function of vertical sand drain. **[8]**

b) State the procedure of vibro-flotation technique for ground improvement. **[8]**

OR

Q8) a) Explain in-situ ground improvement by compaction piles. **[8]**

b) Describe in short following terms in ground improvement. **[8]**

i) Grouting

ii) Deep mixing

Q9) a) What do you mean "Rheology" in respect of soil? **[5]**

b) What are the limitations of Rheological models? **[5]**

c) Explain Kelvin's rheological model with a neat sketch **[6]**

OR

*Q10)*a) Write a note on following soil phenomena. **[8]**

i) Secondary consolidation

ii) Creep

b) Explain Maxwell's Rheological model. **[8]**

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