

Total No. of Questions : 10]

SEAT No :

P2148**[5059]-513**

[Total No. of Pages : 2

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.5 or 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 $C=20\text{KN/m}^2$ and $\gamma=15\text{KN/m}^3$. [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]

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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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