Total No. of Questions : 10]

SEAT No. :

P2120

[Total No. of Pages : 2

[5254]-513
B. E. (Civil) (Semester - I)
ADVANCED GEOTECHNICAL ENGINEERING
(2012 Pattern) (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, Q7 or Q8, Q9 or Q10.***
2) ***Figures to the right indicate full marks.***
3) ***Assume Suitable data, if necessary.***
4) ***Use of electronic pocket calculator is allowed in the examination.***
5) ***Neat diagrams must be drawn wherever necessary.***

Q1) a) Explain Textural Classification of soil system. **[4]**

b) State the earth pressure at rest, active and passive. **[6]**

OR

Q2) a) Differentiate between Rankine's and Coulomb's earth pressure theories. **[4]**

b) With the help of structure, explain any two Clay minerals. **[6]**

Q3) a) A 5 m high retaining wall has to retain a backfill of dry, cohesionless soil having the properties $\varnothing = 30^{\theta}$; e = 0.74, G = 2.68, $\mu = 0.36$. Determine the magnitude and point of application of the resultant thrust. Compute the percent change in the lateral thrust if the water table rises from a great depth to the top of the backfill. **[5]**

b) Explain mechanism of reinforced soil. **[5]**

OR

Q4) a) Write a note on : **[5]**

i) Function of Geosynthetics.

ii) Slope stabilization using soil nails.

b) A vertical excavation was made in a clay deposit having unit weight of 20 kN/m^3. It cracked after digging reached the depth of 4 meters. Calculate total active and passive earth pressure. **[5]**

P.T.O.

Q5) a) Describe elastic half space method in machine foundation. **[8]**

b) State the design procedure for a block foundation for cyclic loading. **[9]**

OR

Q6) a) Define the following term. **[8]**

i) Natural Frequency ii) Period

iii) Resonance iv) Degree of Freedom

b) State the design criteria for machine foundation. **[9]**

Q7) a) Explain the following : **[8]**

i) Grouting ii) Freezing soil

b) State the purpose of 'sand drain' and explain function of vertical sand drain. **[9]**

OR

Q8) a) Write a note on : **[8]**

i) Bored compaction piles

ii) Deep mixing

b) Describe the procedure of vibro-flotation technique for ground improvement. **[9]**

Q9) a) Explain Kelvin's rheological model with a neat sketch. **[8]**

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

i) Creep

ii) Secondary consolidation

OR

Q10)a) Explain in detail 'Maxwell model'. **[8]**

b) Explain 'Saint - Venants' model. **[8]**