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Total No of Questions: [XII] *SEAT NO. :* [ ]

[Total No. of Pages : 2]

B.E. Civil- (2008 course) (Advance Geotechnical Engg)

(Elective - I)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Answer Q1 OR Q2, Q3 OR Q4, Q5 OR Q6 from* **SECTION I** *Q7 OR Q8, Q9 OR Q10, Q11 OR Q12 from* **SECTION II**
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Use of Calculator is allowed.*
6) *Assume Suitable data if necessary*

SECTION I

Q1) a) Differentiate between **Tetrahedral unit & Octahedral unit** of clay minerals. [6]

b) Explain the role of **montmorillonite** in Geotechnical engineering [5]

c) State the criteria that should be satisfied for classifying following soils: [5]
SW GPSM MH Cl

OR

Q2) Explain the following: [16]
A. ISCS classification
B.HRB classification
C. Diffuse double layer
D. A -Li n e Chart

Q3) a) A retaining wall 5m high, with vertical back supports a backfill with horizontal GL.Y= 18Kn/m^3 & 0=35.The angle of wall friction is 20.A footing running parallel to the retaining wall and carrying load intensity of 18Kn/m ,is to constructed. Find the safe distance of the footing from the face of wall so that there is no increase in lateral pressure on the wall due to the load of footing. [10]

b) Explain- (I) AEP (2) PEP (3) EP at rest [7]

OR

Q4) a) Explain the steps for 'Anchored Sheet pile design' [9]

b) Deri ve the expression for 'Ko K.and Kp' [9]

Q5) a) Explain 'soil nailing' with the application situations. [5]

b) Discuss the use of geosynthetics in geoenvironment [6]

c) Draw the sketch of 'Reinforced Earth wall' and explain its components. [6]

OR

Q6) a) State the functions for which geosynthetics can be used. [6]

b) Explain 'Binquet & Lee' theory. [6]

c) Explain the properties & functional requirement of geogrid. [5]

SECTION II

Q7) a) Using Harken's expressions for natural frequency and the amplitude of vibrations, calculate the change in the percentage amplitude in terms of r if soil mass participating in the vibrations is 23% of m. Also, calculate this change for r=0.3 and r=2 [10]

b) Define the design criteria for **IMPACT** type machines as per IS-2974 (Pt-11)-1966. [7]

OR

Q8) a) Define the design criteria for **reciprocating** type machines as per IS-2974 (Pt-II)-1966. [8] [9]

b) Discuss spring constants and explain how you determine the same in field as well as laboratory tests. [8]

Q9) Explain the following:- [17]

a) Compaction pile [4]

b) Ibrotlotation [4]

c) Stone column [4]

d) Sand drains [5]

[9]

OR

Q10) a) Discuss the different methods for 'Grouting' [5]

b) Explain the stage of inserting reinforcement in Vibro-expanded pile [5]

c) a) Explain the following with reference to blasting. [7]

i)) General procedure ii) Specification iii) Precaution

Q11) a) Explain the following: [16]

a. Secondary Consolidation
b. Creep
c. Resainic model
d. Maxwell model

OR

Q12) What is meaning of Rheology and its purpose in the context of geotechnical engineering and also state their different models and their utility in detail? [16]