

Total No. of Questions : 12]

SEAT No. :

P1511

[4759]-8

[Total No. of Pages : 3

B.E. (Civil)

ADVANCED GEOTECHNICAL ENGG.

(2008 Pattern) (Semester - I) (Elective - I)

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) Answer 3 questions from section I and 3 questions from section II.*
- 2) Answers to the two sections must be written in separate books.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Your answers will be valued as a whole.*
- 5) Use of electronic pocket calculator is allowed & IS codes are not allowed.*
- 6) Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Discuss different soil classification systems. [8]
- b) Explain different 'clay minerals'. [8]

OR

- Q2)** a) Explain the steps for using 'A-line' chart, giving sample calculations. [8]
- b) Differentiate between 'Tetrahedral unit' & 'Octahedral unit' & explain the role of 'Montmorillonite'. [8]
- Q3)** a) Explain 'modified Culman's method' by drawing sample graph. [8]
- b) Explain: [9]
- i) AEP
 - ii) PEP
 - iii) EP at Rest

OR

P.T.O.

Q4) a) Design a gravity retaining wall, 5m high with vertical back to retain a dry sand with $\gamma = 19\text{kN/m}^3$, $\phi = 30^\circ$. Also find the FOS against sliding assuming $\delta' = 30^\circ$, the wall is made up of stone masonry with $\gamma = 23\text{ kN/m}^3$ & top width of 1.5 m. Use Rankine's theory. [9]

b) Explain the steps for 'free earth support' method by giving sample calculations. [8]

Q5) a) Discuss the following: [12]

i) Geosynthetics & their functions.

ii) Properties & functional requirement of geogrids.

b) Explain 'RE wall components'. [5]

OR

Q6) a) Explain 'Biquet & Lee' Theory. [6]

b) Discuss 'Geosynthetics in geoenvironment. [6]

c) Explain, 'Soil Nailing' with situations applicable. [5]

SECTION - II

Q7) Explain the following: [4x4=16]

a) Elastic Half space Theory.

b) Free & forced vibrations.

c) Barken's method.

d) Pauw's analysis.

OR

Q8) a) Discuss the design criteria for impact type machines as per IS-2974 - pt-II-1966. [8]

b) Discuss the tests for determination of 'spring constant'. [8]

Q9) Explain the following:

a) Compaction pile. [4]

b) Stone column. [4]

c) Vibro- floatation. [4]

d) Sand drains. [5]

OR

Q10)a) Explain stepwise the design of sand drains, by giving sample calculations. [9]

b) Explain the stages of inserting reinforcement in Vibro-expanded pile. [8]

Q11) Explain the following:

a) Rheology. [5]

b) Basic Rheological models. [6]

c) Composite Rheological models. [6]

OR

Q12) Discuss the following:

a) Hookean & Newtonian model. [6]

b) Secondary consolidation. [6]

c) Creep. [5]

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