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Question Bank

Subject – **BTCVE605_ Advanced Soil Mechanics**

1. Discuss the characteristic and construction of Kaolinite mineral and Montmorillonite mineral with neat sketch
2. Describe the Tetrahedral unit and octahedral unit with neat sketch
3. What are primary valence bond and explain them with example.
4. Differentiate between gravitational forces and surface forces. What are the effects of increased surface area on the property of soils?
5. What are secondary valence bonds? Write a short note on Vander Wall forces.
6. Write short note on electric charges on clay minerals.
7. Discuss the characteristic and construction Illite, mineral and Halloysite mineral with neat sketch.
8. Discuss the characteristic and construction of mineral which effects on swelling and shrinkage property of soil.
9. Explain how the types of mineral and their characteristics effects on soil properties.
10. Write short note on hydrogen bond and give their example.
11. Derive an expression for vertical stress at a point due to a concentrated load using Boussinesq's theory
12. Derive an expression for vertical stress just below the load using Boussinesq's theory
13. Determine point load which make vertical stress at point A (2, 0, 1). Don't increase vertical stress by 6 kN/sqm
14. A concentrated load 2000 kN is applied at the ground surface. Determine the vertical stress at a point 'P' which is 6m directly below the load.
15. Derive an expression for vertical stress under circular area using Boussinesq's theory.
16. Write short note on stress Isobar or pressure bulb concept.
17. A single concentrated load 1000 kN acts at the ground surface. Construct an isobar for a vertical pressure of intensity of 40 kN/sqm. Use Boussinesq's formula

18. Explain the procedure of vertical stress distribution on horizontal plane with example.
19. Explain the procedure of vertical stress distribution on vertical plane with example.
20. Write short note on construction of Newmark's influence chart.
21. Write the advantages and disadvantages of Newmark's influence chart.
22. Write short note on limitations of Boussinesq's theory.
23. Write short note on assumptions of Boussinesq's theory.
24. Enlist the multi task equipment and explain any one of them in detail with neat sketch.
25. Enlist the equipment used for excavation and explain any one of them in detail with neat sketch.
26. Enlist the excavators and explain any one of them in detail with neat sketch.
27. Enlist equipment used for compaction and explain any one of them in detail with neat sketch.
28. Define the earthwork, excavatability of soil, bulking of soil and shrinkage of soil.
29. Define the productivity of earthwork and derive the output of static roller.
30. Write short note on scraper and define its utility of in detail.
31. Write short note on selection of earthmoving equipment.
32. Write short note on pneumatic tyre roller and define its utility in detail.
33. Write short note on roto-tiller machine.
34. Write short note on grader machine.
35. Describe the objectives of ground improvement and modification.
36. Describe the general method of ground improvement.
37. Explain the compaction pile technique of ground improvement.
38. Describe the Impact compaction of sand technique of ground improvement.
39. Describe the vibration compaction of sand technique of ground improvement.
40. Describe the pre compression techniques of cohesive soil in detail.
41. Differentiate between ground improvements techniques of cohesive soil and cohesion less soil.
42. Describe influence on soil due to general technique of ground improvement.
43. Differentiate between the ground improvement and modification.
44. Explain the technique of explosion in sand of ground improvement.
45. Explain the additives in soil technique of ground improvement.
46. Differentiate between ground improvement and grouting of soil.

47. Enlist the method used for ground improvement of cohesion less soil and explain any one of them with neat sketch.
48. Enlist the method used for ground improvement of cohesive soil and explain any one of them with neat sketch.
49. Describe the mechanism of soil reinforcement with neat sketch
50. Describe the objectives of soil reinforcement.
51. Write the application of soil reinforcement with one example.
52. Write the advantages and disadvantages of reinforced soil embankment.
53. Explain the procedure of soil reinforcement to slopes of embankment with neat sketch
54. Explain the procedure of soil reinforcement to vertical faces with neat sketch.
55. Explain the procedure of soil reinforcement to open excavations with neat sketch
56. Explain the procedure of soil reinforcement to beneath unpaved roads with neat sketch.
57. Explain the procedure of soil reinforcement to beneath foundation with neat sketch.
58. Explain the function of geosynthetic with neat sketch.
59. Explain the advantages and disadvantages of geosynthetic.
60. Explain in detail geomembrane and its uses.
61. Explain in detail geotextile and its uses.
62. Explain in detail geogrid and its uses.
63. Write the application of geosynthetic in civil engineering works.
64. Write the purpose of grouting in soil.
65. Explain in detail the types of grouts in grouting technique of soil.
66. Describe the characteristic of grouts in grouting technique of soil.
67. Describe the permeation method of grouting of soil in detail with neat sketch
68. Write the application of permeation method of grouting of soil.
69. Explain in detail displacement compaction grouting technique of soil with neat sketch.
70. Write the application of displacement compaction grouting technique of soil with neat sketch.
71. Explain in detail displacement soil fracture grouting technique of soil with neat sketch.
72. Explain in detail jet or replacement displacement grouting technique of soil with neat sketch.
73. Explain in detail different types grouting technology of jet grouting method.
74. Differentiate between reinforced soil and grouting of soil.
75. Write the application of grouting technique in civil Engineering works.
76. Explain soil reinforcement state advantage of reinforcement earth structure.

77. Explain with the help of neat sketch various elements of earth wall stating the specification requirement function of each element.
78. Derive expression for length of reinforcement in reinforcement earth wall.
79. Write a note on geotextiles and list various types of geotextiles
80. Explain the use of geotextiles in roadway railway and earth dam construction.
81. Enlist different types of earth moving equipment.
82. Enlist classification of construction equipment
83. Write factors affecting selection of construction equipment.
84. Define earth moving equipment write factors affecting selection of earth moving equipment.
85. Difference between gravitational forces and surface forces
86. What is the effect of increased surface area on properties of soil?
87. What is primary valance bond?
88. What is the importance of primary valance bond in soil engineering?
89. State the assumptions made in computing stresses below the ground surface due to point load acting on it. Discuss their validity in practice.
90. Drive an expression for vertical stress at a point due to pointy load using Bosinnesque's equation.

Note: This question bank is only for reference.

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