



**SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR**  
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**QUESTION BANK (DESCRIPTIVE)**

**Subject with Code : GE-II(13A01702)**

**Course & Branch: B)Tech - CE**

**Year & Sem: IV-B)Tech & I-Sem**

**Regulation: R13**

**UNIT -I**  
**SOIL EXPLORATION**

1. State the various types of samplers and samples and draw the neat section of a cutting edge of a samplers giving inside clearance outside clearance and area ratio with respect to diameters. [10M]
2. What are the IS recommendations for soil samples and also for the soil sample disturbance. [10M]
3. State the various methods of soil exploration and explain in detail the penetration tests. [10M]
4. Draw a neat sketch of split spoon Sampler showing all the salient parts. [10M]
5. How do you prepare the soil investigation report along with analysis and recommendations [10M]
6. The field N value in a deposit of fully submerged fine sand was 40 at a depth of 6 ms the average saturated unit weight of the soil is 19kN/m<sup>3</sup>. Calculate the corrected N value as per IS 2131-1981. [10M]
7. What are the various steps considered in the planning of sub-surface exploration program? Discuss in detail. [10M]
8. Explain the significance of, [10M]
  - i. Inside clearance
  - ii. Outside clearance
  - iii. Area ratio
9. What is meant by geophysical methods of soil exploration? Describe the two most commonly used geophysical exploration methods and compare their merits and demerits. [10M]
10. A) What do you understand by Site Investigation? What are the different purposes for which Site investigations are done? [2M]
- B) What is reconnaissance? What type of information is obtained in reconnaissance? [2M]
- C) What is depth of exploration and lateral exploration? [2M]
- D) Describe open excavation methods of exploration. What are their advantages and disadvantages? [2M]
- E) What are the methods of drilling holes for subsurface investigations? [2M]

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16. In electrical profiling method the mean resistivity can be determined by using [     ]  
 A)  $\frac{2\pi\rho l}{I}$     B)  $\frac{2\pi\rho l}{V}$     C)  $\frac{2\pi\rho}{I}$     D)  $\frac{2\pi V}{I}$
17. For an undisturbed sample, the area ratio of samples should be [     ]  
 A) zero    B) 10% or less    C) 10% to 20%    D) more than 20%
18. The actual value of standard penetration number (N) is greater than 15 for fine sands below water table, the corrected value of N is [     ]  
 A)  $15 + \left[ \frac{N+15}{2} \right]$     B)  $15 - \left[ \frac{N+15}{2} \right]$     C)  $15 + \left[ \frac{N-15}{2} \right]$     D)  $15 + \left[ \frac{15-N}{2} \right]$
19. The height – diameter ratio for in-situ vane is [     ]  
 A) 1.0    B) 1.50    C) 2.00    D) 3.0
20. For a good quality of soil sample \_\_\_\_\_ [     ]  
 A) The area ratio should be low    B) The thin cutting edge  
 C) The inside and outside clearance should be small    D) All the above
21. Undisturbed soil samples are required for [     ]  
 A) Specific gravity test    B) hydrometer test  
 C) Shrinkage limit test    D) consolidation test
22. Standard penetration test measures [     ]  
 A) Shear strength of soft clays    B) shear strength of sands  
 C) Consistency of clays    D) none of the above
23. The range of N value for a very loose sand is [     ]  
 A) 0 to 4    B) 4 to 10    C) 10 to 30    D) 30 to 50
24. The degree of disturbance for a soil sample is usually expressed by [     ]  
 A) Void ratio    B) area ratio    C) recovery ratio    D) consolidation ratio
25. For determination of exact corrected number [     ]  
 A) Dilatancy correction should be applied first    B) Overburden correction should be applied first  
 C) Both a & b should be applied at a time    D) none of the above
26. For a very dense sand the N value is [     ]  
 A) 30 to 50    B) < 30    C) > 50    D) < 10
27. Identify the incorrect statement. N values from SPT are correlated with [     ]  
 A) unit weight    B) relative density    C) angle of internal friction    D) sensitivity
28. For undisturbed sample, the area ratio should not normally exceed [     ]  
 A) 10%    B) 25%    C) 30%    D) 35%
29. Consider the following properties for a soil sampler [     ]  
 1. area ratio should be low    2. cutting edge should be thick  
 3. inside clearance should be high    4. outside clearance should be low
- The properties necessary for a good quality of soil sample is  
 A) 1 and 4    B) 1,2 and 4    C) 2,3 and 4    D) 1,3 and 4
30. Consider the following statements [     ]  
 In sub soil exploration programme the term “significant depth of exploration” is upto  
 1. the width of foundation    2. twice the width of foundation  
 3. the depth where the additional stress intensity is less than 20 % of overburden pressure  
 4. the depth where the additional stress intensity is less than 10 % of the overburden pressure  
 5. hard rock occurs.  
 Of these statements

- A) 1, 3, 5 are correct B) 2, 3, 5 are correct C) 1, 4 are correct D) 2, 4 are correct
31. Seismic refraction method is applicable only when the wave velocity in the lower layer is \_\_\_\_\_ that in the upper layer. [     ]  
A) less than B) greater than C) equal to D) twice than
32. Identify the incorrect statement. Undisturbed samples are obtained from [     ]  
A thin walled samplers B) piston samplers  
C) split spoon samplers D) Shelby tubes
33. The height - diameter ratio for the in - situ vane is [     ]  
A) 1 B) 1.5 C) 2 D) 3
34. In- situ vane shear test is used to measure shear strength of [     ]  
A) very soft and sensitive clays B) stiff and fissured clays  
C) sandy soils D) all the above.
35. Below ground water table for some soils a correction is applied to the observed standard penetration test N value if it is greater than 15. The soils are [     ]  
A) Coarse sand B) very fine sand with silt C) medium sand D) clay
36. Standard penetration test was conducted at a site. The recorded values of blow count for every 15 cm penetration at depth of 1m are 5, 9 and 10 respectively. The value of SPT blow count (N) that should be used is [     ]  
A) 15.50 B) 15 C) 17 D) 19
37. A 600 mm square bearing plate settles by 15 mm in plate load test on a cohesion less soil under  $0.2 \text{ N/mm}^2$ . The settlement of a prototype shallow footing 1 m square under the same intensity of loading is [     ]  
A) 15 mm B) between 15 mm and 25 mm C) 25 mm D)  $> 25 \text{ mm}$
38. A 300 mm square bearing plate settles by 15 mm in plate load test on a cohesive soil under  $0.2 \text{ N/mm}^2$ . The settlement of a prototype shallow footing 1 m square under the same intensity of loading is [     ]  
A) 15 mm B) 50 mm C) 30 mm D) 167 mm
39. the relation between corrected number is equal to recorded number ( $N = N_R$ ) when  $\sigma_0$  is [     ]  
A)  $< 71.8 \text{ kN/m}^2$  B)  $> 71.8 \text{ kN/m}^2$  C)  $= 71.8 \text{ kN/m}^2$  D)  $> 24 \text{ kN/m}^2$
40. In standard penetration test, the split spoon sampler is penetrated into the soil stratum by giving blows from a drop weight whose weight ( in kg) and free fall ( in cm) are respectively, [     ]  
A) 30 and 60 B) 60 and 30 C) 65 and 75 D) 75 and 65

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