

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER M. TECH DEGREE EXAMINATION

Civil Engineering

(Geomechanics & Structures)

04 CE 7311 – SLOPE STABILITY

Use of IS codes and Stability Charts are permitted

Max. Marks: 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. State the effect of increasing pore pressure on stability of earthen slopes.
2. A vertical cut is made in a clay deposit. ($c = 40\text{kN/m}^2$, $\gamma = 17\text{kN/m}^3$ and $\phi = 0^\circ$). Find the maximum height of the cut which can be temporarily supported
3. Discuss the function of providing lightweight fills in slope stabilization
4. Explain various rock slope stabilization methods.
5. Explain types of landslides.
6. Explain how to identify impending landslides and historic landslides.
7. Discuss any two configuration of landslides with sketches
8. What are Anchor trenches?

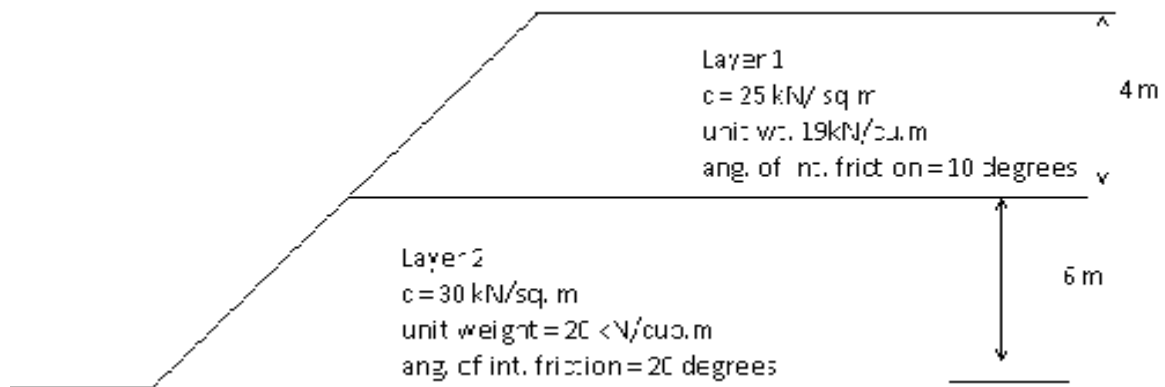
PART B

Each question carries 6 marks

9. Explain variations of hydrostatic pressures that exist along rock discontinuities for
 - a. No tension crack and toe drained condition
 - b. No tension crack and toe blocked
 - c. With tension crack and toe blocked.

OR

10. Explain how monitoring of groundwater pressures are performed.
11. Determine the factor of safety of the slope shown in figure. The slip circle passes through two layers of soil. Use Bishop's method. Assume any missing data



Layer I: $c = 25 \text{ kN/m}^2$, unit weight = 19 kN/m^3 , $\phi = 10^\circ$, $H_1 = 4 \text{ m}$,

Layer II: $c = 30 \text{ kN/m}^2$, unit weight = 20 kN/m^3 , $\phi = 20^\circ$, $H_2 = 6 \text{ m}$

OR

12. An embankment has a slope of 2H to 1V with a height of 20m. It is made of soil having cohesion of 38 kN/m^2 and an angle of internal friction of 20° and unit weight of 17.8 kN/m^3 . Consider any failure circle passing through the toe. Use method of slices to find the factor of safety.

13. Explain in detail about

- a. Buttrressing for slope stabilization
- b. Counterberms for slope stabilization

OR

14. Explain in detail about

- a. Gravity retaining walls
- b. Geosynthetically reinforced slopes

15. Elaborate any three methods of surface slope protection.

OR

16. State any three alternate methods of slope stabilizing

17. Explain types of landslides and its mechanism

OR

18. Explain

- a. Landslide rate and types of movements
- b. Correlation between landslides and rainfall

19. Discuss slope stability considerations of a landfill and Anchor trenches

OR

20. Discuss stability of landfills under following pretext

- a. Cover system stability
- b. Waste fill stability