UNIT V – SLOPE STABILITY

Part A -2 Mark Questions & Answers

1. Define slide.

The failure of a mass of soil located beneath a slope is called a slide.

2. State the causes for failure of slope.

(i) The action of gravitational forces, and
(ii) Seepage forces within the soil.
(iii) Failure due to undercutting of its foot.
(iv) Failure due to disintegration of the structure of the soil.

3. Give the types of slope.

(i) Infinite slope
(ii) Finite slope

If a slope represents the boundary surface of a semi-infinite soil mass, and the soil properties for all identical depths below the surface are constant, it is called an infinite slope.

If a slope is of limited extent, it is called finite slope.

4. Enumerate the basic types of failure of a finite slope occurance.

(i) Slope failure
(ii) Base failure

5. Give the types of slip surfaces or failure surfaces

(i) Planner failure surface
(ii) Circular failure surface
(iii) Non- circular failure surface

6. Give the method of analysis for stability of a finite slope

(i) Culmann's method of planner failure surface
(ii) The Swedish circle method (slip circle method)
(iii) The friction circle method
(iv) Bishop's method

7. Give the controlling measures for slope protection.

The controlling measures for the protection of slope can be taken by
(i) Providing retaining wall on the side of filing
(ii) Providing good base course for the soil.
(iii) Making top surface as hard layer.

8. Define slope failure.

If the failure occurs along a surface of sliding that intersects the slope at or above its toe, the slide is known as slope failure.

9. Define face failure.

If the arc passes above the toe is called face failure.

10. Define toe failure.

If the arc passes through the toe is called toe failure.

11. Define base failure.

If the soil beneath the toe of the slope is weak the failure occurs along a surface that passes at someone distance below the toe of the slope. Such type of failure is called base failure.

12. Under what circumstances planar failure will occur?

Planar failure surface may commonly occur in a soil deposit or embankment with a specific plane of weakness. Excavation in stratified deposit quite often leads to a planar failure surface along a plane parallel to the strata.

13. How the stability of slope of an earthen dam will you analyze?

(i) Stability of downstream slope during steady seepage.

(ii) Stability of upstream slope during sudden drawdown.

(iii) Stability of upstream and downstream slopes during and immediately after the construction.

14. Give the forces acting on the sliding wedge in the friction circle method.

(i) The weight of the wedge

(ii) The total frictional resistance

(iii) Total cohesive resistance

Part B -12 Mark Questions

1. Explain the Swedish Circle method of Analysis of slopes.
2. Explain the friction Circle method of analysis of stability of slopes,
3. Explain the Culmann's method of analysis of stability of slopes.
4. Explain the Bishop's method of analysis of stability of slopes.
5. Explain with a neat sketch the slope failure mechanisms.
6. Give the method of slope protection measures. Explain briefly.