Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (Civil Engineering) (2011 Onwards E-I & II) (Sem.–7,8)

EARTH AND EARTH RETAINING STRUCTURES

Subject Code : BTCE-812

M.Code : 71871

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1) Answer briefly :

(a) What are the different modes of failure of retaining walls?

(b) What are Anchored sheet piles?

(c) How would you control the seepage through the dam and foundation?

(d) What do you understand by the term Crest?

(e) What are different types of earth pressures?

(f) What are the assumptions of Rankine's theory?

(g) What is a coffer dam? Name the different types of coffer dams.

(h) Sketch a typical section of a braced cut and show the various components.

(i) Define Earth pressure at rest.

(j) What are the different factors of safety used in the stability of slopes?

SECTION-B

2) Describe Bishop's simplified method. Derive an expression for the factor of safety.

3) Discuss the procedure for checking the stability of a cantilever sheet pile wall.

4) A masonry retaining wall of trapezoidal section of 10m height has top width of 1.5m, bottom width of 6.5m. The earth face of the retaining wall has a batter of 1 in 10. Check the stability of the masonry wall for sliding and overturning moment. Assume soil surface is horizontal at the top of the masonry wall. Unit weight of the soil is 18kN/m^3. The angle of repose of the soil is 30°. Factor of safety against sliding is 0.6.

5) Discuss the method for the design of a circular, cellular, coffer dam on rock.

6) Discuss Friction circle method in detail for investigation of stability of finite slopes.

SECTION-C

7) What is the criteria to be met by transition filters for protection against piping? The core of an earth dam heading protection against piping has D_{15} of 0.001 mm and D_{85} of 0.006 mm. Three soils, namely A, B, C are available for serving as transition filter. The grain size distribution curve of all these three soils has the same general shape as the soil to be protected D_{15} of these soils are 0.0025 mm, 0.006 mm and 0.036 mm respectively for soil A, B and C. Which of these soils would you select as transition filter material?

8) How does (a) excess seepage and (b) excess pore water pressures and gradients, affect the stability and performance of an earth dam. Discuss effective measures to control the same.

9) Write notes on :

   (a) Gravity retaining walls

   (b) Trial wedge method

   (c) Perched water table

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.