

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00525

June, 2019

**BICEE-019 : EARTH AND ROCKFILL DAM
ENGINEERING**

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **five** questions. Assume missing data suitably. Use of scientific calculator is permitted.*

1. (a) Draw a typical labelled section of an embankment dam. 7
- (b) Describe different types of earthen dams. 7

2. Discuss in detail, various causes of failure of earthen dams. 14

3. Discuss the design criteria of earthen dams. 14

4. (a) What are the various investigations required for the selection of site for Earth and Rockfill dams ? Write their names and briefly discuss any one of them. 7
- (b) Explain the Brazilian split tension test on rocks. 7
5. Write short notes on any **four** of the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Sudden Drawdown
 - (b) Phreatic Line
 - (c) Consolidation of Earthen Dams
 - (d) Rockfill Dams
 - (e) Cofferdam
 - (f) Relief Wells
6. An earthen dam is made of homogeneous material which has the following data :
- Level of the top of the dam = 200 m
 - Level of deepest river bed = 178.0 m
 - HFL of reservoir = 197.5 m
 - Width of top of dam = 4.5 m
 - U/S slope = 3 : 1
 - Downstream slope = 2 : 1
 - Length of horizontal filter from d/s toe, inwards = 25 m

Cohesion (c) of soil of dam = 2.4 t/m^2

Cohesion (c) of soil of foundation = 5.4 t/m^2

ϕ of soil in dam = 25°

ϕ of soil in foundation = 12°

Dry weight of soil in dam = 1.8 t/m^3

Submerged weight of soil in dam = 1.2 t/m^3

Dry unit weight of foundation soil = 1.83 t/m^3

Coefficient of permeability of soil in dam
= $5 \times 10^{-6} \text{ m/s}$

The foundation soil consists of 5 m thick layer of clay. Check the stability of u/s slope portion of dam under sudden drawdown condition. 14

7. (a) What are the advantages of rockfill dams over earthen dams? 7
- (b) Explain, briefly, how the stability of slopes in earthen dams can be improved. 7
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