Total No. of Pages: 02

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## M.Tech. (Soil Mechanics & Foundation Engineering)(Sem. – 2) EARTHEN EMBANKMENT

Subject Code: CESE-18

## M Code: 37207

## Date of Examination : 24-12-2022

Time: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS TO CANDIDATES:

- 1. Attempt any FIVE questions out of EIGHT questions.
- 2. Each question carries TWENTY marks.
- 1. Explain in detail about the corrective measures for the treatment of weak foundation for an earthen embankment. Also, discuss about sub-surface investigation for a dam site.
- 2. a) What are the basic tests used for the identification of coarse-grained and fine-grained soil? Explain in brief.
  - b) Explain in brief the lab tests to de conducted for predicting the settlement of earth dam made up of clayey material.
- 3. a) List the appurtenances used in the earthen embankment and give their importance.
  - b) Explain in brief, about rock fill dams with the help of neat sketches and also label its components.
- 4. a) Define darcy's law and discuss its validity?
  - b) Derive an expression for Laplace's equation for the flow through porous media.

c) What do you understand by quick sand? At what critically hydraulic gradient, the quick sand condition will occur in a fine sand and void ratio of 0.60 and having a specific gravity of solids as 2.6?

- 5. a) Derive an expression for the seepage discharge through an embankment analytically when the discharge face is inclined and the angle of inclination is less than 30°
  - b) An earthen embankment has the following details:

Height of embankment = 35mTop width = 4.5mFree board = 2.3mLength of filter from toe = 18mSlope of U/s = D/s= 2.5H : 1.2VTake k =  $6x10^{-5}$  cm/sec Draw the phreatic line.

- 6. a) Explain in brief about the rolled and hydraulic fill method for the construction of an earthen embankment.
  - b) Discuss various earth moving machinery and compaction equipment used in earth dam construction.
- 7. a) What precaution and remedial measures would you undertake to control the seepage through the dam foundation?
  - b) Discuss the various damages which may be caused to an earthen dam due to an earthquake and the measures to be taken to prevent it.
- 8. Write short notes on the following:

(6+7+7)

- a) Stopping and Scaling
- b) Piping and Soiling
- c) Stability analysis

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