

KERALA AGRICULTURAL UNIVERSITY

B.Tech (Agrl.Engg) Degree Programme 2013 Admission

VIth Semester-Final Examination-July-2016

Cat. No: Lwre.3206

Title: Soil and Water Conservation Structures (2+1)

Marks: 50

Time : 2 hours

I. Fill in the blanks

(10 x 1=10)

1. ✓ Open channel flow is said to be unsteady if the discharge of flow changes with _____.
2. Wire mesh boxes, which are mostly rectangular in shape and filled with stones and are most commonly used to control erosion are called as _____.
3. For critical state of flow, Froude number is equal to _____.
4. ✓ The shape of seepage line in an embankment is _____.
5. ✓ In a chute spillway, the hydraulic jump is created at its _____.
6. The spacing of check dams is kept between _____ to _____ m.
7. ✓ The line of seepage in an earthen embankment is also called as _____.
8. Froude number is the ratio of inertial forces to _____.
9. Soil filling used in the middle of the cross section of an earthen dam to prevent seepage is called _____.
10. In a spillway basin, a stilling basin is used for _____ purpose.

II Answer any FIVE of the following

(5 x 2=10)

1. ✓ Differentiate uniform and non-uniform flow.
2. Explain the creep line theory taking one drop spillway structure.
3. ✓ Write short notes on loose rock check dam.
4. Determine the height of wing wall of a drop structure, if net drop from top of transverse sill to crest is 2.5 m, head over crest is 1.5 m and height of transverse sill is 0.5m.
5. How will you determine the saturation line for a specific flow condition in case of a drop structure?.
6. How will you test safety against sliding, overturning, crushing and tension in a drop spillway?.
7. Differentiate between free flow and submerged flow conditions with suitable diagrams.

III. Write short notes on ANY FIVE of the following

(5 x 4=20)

1. ✓ Design an earthen embankment of 20 m height.
2. Define specific energy and derive the criterion for a critical state of flow in open channel.
3. ✓ Discuss in detail about the concepts of hydrologic, hydraulic and structural design of gully control structures.
4. ✓ Explain in detail about the components of farm pond and selection of site for construction of farm ponds.
5. Discuss in detail about the design of straight drop spillway.

6. Discuss briefly on the design of diversions.

7. Discuss in detail about the different types and states of open channel flow.

IV. Write essay on ANY ONE of the following

(1 x 10=10)

1. Describe the different parts and their functions with a neat sketch, advantages and disadvantages of drop inlet spillway.

2. Discuss the different types of small earth embankments. List down the design criteria and design procedure of earthen dam in detail with all protective measures.