



KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Agrl. Engg.) 2018 Admission

V Semester Final Examination-February 2021

Iden 3108

Drainage Engineering (1+1)

Time: 2 hours

I Fill up the following

(10x1=10)

1. Growth rate of most of the plants reduces when the soil water solution has salt concentration exceeding about _____ ppm.
2. According to MoWR, Govt. Of India, area is said to be waterlogged if water table is within _____ m from land surface.
3. _____ drains are oriented perpendicular to the direction of groundwater flow.
4. Recommended side slopes for drainage ditch in heavy clay soils is _____.
5. Filters are recommended for SSD in case of non-cohesive soils with clay content less than _____%.

Match the Pairs.

- | | |
|---------------------|--|
| 6. Observation well | A. Poplar |
| 7. Darcy's law | B. Peak drain discharge |
| 8. Piezometer | C. Blind pipes |
| 9. Bio drainage | D. Flow through saturated porous media |
| 10. Rational method | E. Perforated pipes |

II Write Short notes on ANY FIVE of the following

(5x2=10)

1. Classify the salt affected soils based upon pH, ECe and ESP.
2. Write down the difference interceptor drains and relief drains with neat sketches.
3. Define "Leaching requirement". State the equation to compute Leaching Requirement.
4. Explain Mole Drainage with neat sketch.
5. Enlist the factors influencing the movement of water into the subsurface drains.
6. State and explain the salt balance equation for irrigated lands with neat sketch.
7. Drainage canal discharges water at the rate of 0.2 m³/s while draining 250 ha area. Compute the drainage coefficient of the land.

III Answer ANY FIVE of the following.

(5x4=20)

1. Derive Hooghoudt's equation for the spacing the drains.
2. Explain in detail CN method for the computation of design discharge of drainage system.
3. Enlist the methods for determination of soil permeability. Explain Auger-Hole Method in detail.
4. Explain how to drain (a) Saline Soil and (2) Alkaline Soil
5. Enlist and explain supplemental structures in tile drainage system.
6. Enlist and explain in detail the types of land requiring drainage.
7. Explain drainage coefficient in detail.

Drainage coefficient of an area is 6.6 cm. The catchment area is 6 sq. km. Design a main open drain with bed slope of 0.1 %, assuming the value of Manning's 'n' to be 0.03. Type of soil permits the side slope of 1.5:1. Depth of the drain at outlet cannot exceed 1.5 m based upon the area topography and elevation of outlet.

IV Answer ANY ONE of the following

(1x10=10)

1. Define water logging. Enlist adverse effects of water logging and salt accumulation. Explain various causes of water logging in brief.
2. Write a detailed note on "Drainage Investigations".
