



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agrl. Engg.) 2020 Admission
V Semester Final Examination- January 2023

Iden.3107

Sprinkler and Micro Irrigation Systems (1+1)

Marks: 50
Time: 2 hours

I Fill in the blanks

(10x1=10)

1. Sprinkler irrigation is particularly suited to soils that have a high infiltration rate.
2. The required discharge of an individual sprinkler is a function of the and the two ways spacing of the sprinklers.
3. Fertigation with drip irrigation, if properly managed, can overall fertilizer and water application rates.
4. The of emitters is the main problem encountered in the operation of drip irrigation systems.
5. Solubility of Urea is g/l at 20°C.

Define the following

6. Fertigation
7. Emitter
8. Crop Coefficient
9. Lysimeter
10. Irrigation requirement

II Write short notes on ANY FIVE of the following

(5x2=10)

1. Write a short note on wetting patterns under drip emitters.
2. What do you mean by water spread area of sprinkler? How it can be calculated?
3. Write a short note on hydro cyclone (centrifugal) filter.
4. What are the major steps for the design of a drip irrigation system?
5. How will you calculate the power requirement of a pump for a micro- irrigation system?
6. Write a short note on Sprinkler selection and spacing.
7. Write a short note on head loss due to friction in a micro- irrigation system.

III Answer ANY FIVE of the following

(5x4=20)

1. Briefly explain the effect of water pressure on the design of a sprinkler irrigation system.
2. What are the steps involved in the design procedure of main line of a drip irrigation system?
3. Briefly explain the different methods of fertigation.
4. Briefly explain the types of emitters used in drip systems.
5. Briefly explain the soil moisture depletion method for the measurement of crop water requirement.
6. Briefly explain the evaluation procedure of sprinkler irrigation systems.
7. Briefly explain the necessity of filters in a micro-irrigation system.

IV**Write an essay on ANY ONE of the following****(1x10=10)**

1. Explain the classification of sprinkler irrigation systems.
2. Design a drip irrigation system for a mango orchard of 1 ha area with length and breadth of 100 m each. Mango plants have been planted at a spacing of 5 × 5.5 m and the age of crop is 3 years. The maximum pan evaporation during summer is 12 mm/day. The other relevant data are given below: Make necessary assumptions if required.

Land slope	= 0.40 % upward
Water source	= A well located at the S–W corner of the field
Soil texture	= Sandy loam
Field capacity(FC)	= 16 %
Wilting point (WP)	= 8 %
Apparent specific gravity (AS)	= 1.4 g/cc
Effective root zone depth (Zr)	= 120 cm
Maximum allowable deficit (MAD)	= 20%
Wetting area percentage (WA)	= 30 %
Pan coefficient	= 0.7
Crop coefficient	= 0.8
