KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2022 & Previous Admissions
IV Semester Final Examination – July 2024

Iden.2206   **Irrigation Engineering (2+1)**   **Marks: 50**
                                                      Time: 2 hours

I   **Fill in the blanks**   **(10x1=10)**

1. The tensiometer can measure the matric potential up to……………..bar.
2. Flow condition when Froude number is equal to 1 is …………..
3. In ………….. irrigation system, water is sprayed into the air and is allowed to fall on ground resembling like rainfall.
4. Lysimeter is used to measure ………………
5. …………….. is the flow of water through porous soil in saturated or nearly saturated condition.

State True or False

6. A rectangular channel section is the most economical when the depth of flow is equal to the bottom width of channel.
7. Surface tension in soil increases with increase in soil moisture content.
8. Check basin method of irrigation is suitable for paddy crop.
9. In sprinkler irrigation system, the application rate greater than the basic infiltration rate of soil.
10. Soil moisture measurement through Resistance block method is not suitable for saline soil.

II   **Write short notes on ANY FIVE of the following**   **(5x2=10)**

1. Reference crop evapotranspiration
2. Capillary water
3. Siphon Tubes
4. Profile method of land levelling
5. Froude number
6. Pressure Plate Technique
7. Hydraulic jump

III   **Answer ANY FIVE of the following**   **(5x4=20)**

1. Explain the advantage of Cipolletti weir over trapezoidal weir. Write the equation of discharge through these weirs.
2. Explain the steps involved in the process of environmental impact assessment with the help of flow chart.
3. Write the components of laser guided land levelling. Explain the procedure for determination of centroid of a field with the help of numerical example.
4. Explain different types of water present in the soil.
5. A trapezoidal bund of 80 m long is to be constructed having bottom width as 4 m and top width as 2 m. The height of one end of bund is 1.2 m and that of the other end is 1.5 m. Determine the volume of earth fill for making bund.
6. A field soil sample prior to being disturbed has a volume of 82 cm³. The sample weighed 125 grams. After drying at 105°C for 24 hours, the dry soil sample weighs 100 grams. What is the mass water content? What is the volumetric water content? What depth of water must be applied to increase the volumetric water content of the top 1 m of soil to 0.40?
7. Explain in brief about criteria for selection of surface irrigation method.

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

1. Discuss about different methods for soil moisture measurement.
2. The following data were obtained in determining the soil moisture content at successive depths in the root zone prior to applying irrigation water.

Depth of sampling, cm	Wt. moist soil sample, gm	Oven dry wt. of soil sample, gm
0-25	135.60	127.82
25-50	137.28	128.95
50-75	123.95	116.32
75-100	111.92	103.64

The bulk density of the soil in the root zone was 1.65 gm/cc. the available moisture holding capacity of the soil was 18.0 cm/m depth. Determine

(i)   The moisture content at different depths in the root zone
(ii)   Moisture content in the root zone at the time of irrigation
(iii)   Net depth of water to be applied to bring the moisture content to field capacity
(iv)   Gross irrigation requirement at an estimated field irrigation efficiency of 70 %

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