KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2021 Admission
IV Semester Final Examination – July 2023

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

I   **Fill in the blanks**   **(10x1=10)**
   1.   .... is the total area which can be irrigated by a certain channel or a project.
   2.   One litre is equal to .... cubic metre.
   3.   A .... is a barrier across a river designed to alter the flow characteristics.
   4.   When the flow characteristics change with time at a channel cross section, the flow is
        ....
   5.   Gross irrigation requirement is always .... than net irrigation requirement.
        Define the following
   6.   Duty
   7.   Water meter
   8.   Orifice plate
   9.   Open channel
  10.   Hydraulic radius

II   **Write short notes on ANY FIVE of the following**   **(5x2=10)**
   1.   Write a short note on environmental impact of irrigation projects.
   2.   Describe any two formulae to find out flow velocity in open channels.
   3.   Write a short note on Cipolletti Weir.
   4.   What is the purpose of the inlet structure in an underground pipeline system?
   5.   Write a short note on soil texture.
   6.   What is the difference between the water requirement and the irrigation requirement of the
        crops?
   7.   Write a short note on hydraulics of check basin irrigation.

III   **Answer ANY FIVE of the following**   **(5x4=20)**
   1.   Briefly explain the procedure of flow measurement using Parshall Flume
   2.   Briefly explain the kinds of soil water.
   3.   Briefly explain about various soil moisture constants.
   4.   Briefly explain the methods of infiltration measurement.
   5.   How tensiometers are used for soil moisture measurement?
   6.   Briefly explain the Blaney-Criddle method for the estimation of evapotranspiration.
   7.   The topographic survey of a field gave the following elevations (in m) at grid points

	1	2	3	4	5
A	10.65	10.43	10.07	9.68	9.67
B	10.47	10.42	9.95	9.84	9.75
C	10.32	10.08	9.92	9.65	9.48
D	9.89	9.48	9.67	9.41	9.13

Calculate the elevation of the centroid of the field. Stakes are to be put to guide the
leveling of this field into a playground. Calculate the cut or fill at the grid points, and
compare the quantities of earthwork in cut and fill.

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

1.   Explain different methods of evapotranspiration measurement.

2.   A stream of 135 litres per second was diverted from a canal and 100 litres per second were delivered to the field. An area of 1.6 ha was irrigated in eight hours. The effective depth of root zone was 1.8 m. The runoff loss in the field was 432 m³. The depth of water penetration varied linearly from 1.8 m at the head end of the field to 1.2 m at the tail end. Available moisture holding capacity of the soil is 20 cm per metre depth of soil. Determine the water conveyance efficiency, water application efficiency, water storage efficiency and water distribution efficiency. Irrigation was started at a moisture extraction level of 50 per cent of the available moisture.

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