KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2020 Admission
IV Semester Final Examination – August 2022

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

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

1. The estimated irrigation potential of India is _____ Million ha, without inter-basin sharing.
2. A contracted trapezoidal weir in which each side of the notch has a slope of 1 horizontal to 4 vertical is known as _____.
3. Open channel flow is said to be _____ if the depth of flow is the same at every section of the channel.

Define the following

4. Potential evapotranspiration
5. Crop coefficient
6. Gross irrigation requirement

Match the following

7. Evapotranspiration　　　　　- Current meter
8. Soil moisture　　　　　　　　- Sugar cane
9. Flow Velocity　　　　　　　　- Tensiometer
10. Furrow irrigation　　　　　 - Thornthwaite formula

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

1. What are the differences between pipe flow and open channel flow?
2. Write a short note on pipes for an underground pipeline system.
3. Briefly explain the Blaney-Criddle method of ET estimation.
4. Write a short note on water application efficiency.
5. Determine the size of the stream required to irrigate an area of 20 ha, when there is no effective rainfall. Maximum consumptive use is 6 mm/day and field application efficiency is 50 per cent. The irrigation system is operated for 15 hours each day.
6. What are the general requirements to obtain high efficiency in surface irrigation methods?
7. Write a short note on the design considerations of furrow irrigation.

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

1. Briefly explain the area-velocity method of flow measurement.
2. A prefabricated concrete channel section used for lining an irrigation channel has the following specifications. Bottom width 20.0 cm, Top width 25.0 cm. and height 20.0 cm. Channel slope is 0.25 per cent. Calculate the flow velocity and carrying capacity.
3. What are the purposes of lining irrigation channels? Briefly explain the types of lining.
4. Briefly explain about drop structures.
5. Differentiate between Diversion and Turnout with the help of suitable sketches.
6. What are the inlet structures used in an underground pipeline system? Explain.
7. Briefly explain the profile method of land levelling.

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

1.   Write an essay on direct methods for the measurement of evapotranspiration.

2.   **(a)**   A farmer has got 1 ha land, made into 5 borders each measuring 100 m x 20 m. He irrigated this land. The average root zone depth of the crop is 95 cm. Two days after irrigation, when the soil achieved field capacity he measured depth of water penetration using a soil auger. Depth of penetration obtained from five borders was 75, 80, 97, 100, and 95 cm respectively. Determine water distribution efficiency and water storage efficiency.

     (b)   A stream of water 0.1 m³/s was diverted from a canal and 0.085 m³/s were delivered to the field for 2 hours. An average runoff at the rate of 0.0475 m³/s took place for one hour. Determine water conveyance efficiency and water application efficiency.

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