KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agri. Engg.) 2019 Admission
IV Semester Final Examination- November 2021

Iden 2206   **Irrigation Engineering (2+1)**

Marks: 50
Time: 2 hours

I   **Fill in the blanks**   **(10x1=10)**
1. Utilizable water resources of India as per Central Water Commission 1993 is _____ BCM.
2. Criteria for the classification of irrigation schemes are _____.
3. A _____ is a barrier across a river / channel for the measurement of flow.
4. Theoretically, the most efficient cross section for an open channel is _____.
5. Pump stand is an _____ structure of an underground pipeline system.
   Define the following
6. Soil texture
7. Voids ratio
8. pF of soil
9. Field capacity
10. Hydraulic equilibrium of water in soil

II   **Write short notes on ANY FIVE of the following**   **(5x2=10)**
1. Write a sort note on kinds of soil water.
2. Write a short note on factors affecting infiltration rate.
3. Write a short note on classification of open channel flow.
4. What are the factors to be considered while designing earth channels for conveying irrigation water?
5. What is total soil water potential? What are the components of it?
6. What is check basin irrigation? Write a short note on adaptability of check basin irrigation.
7. Write a short note on irrigation efficiencies.

III   **Answer ANY FIVE of the following**   **(5x4=20)**
1. What is soil moisture characteristic curve? Briefly explain.
2. Explain briefly about the Parshall flume used for flow measurement.
3. Design an earth channel to carry irrigation water at a rate of 60 litres per second. Soil texture is silt loam. The slope of the channel bed is 0.1 per cent. (Permissible velocity of flow is 75cm/sec).
4. What is canal lining? Briefly explain about the materials commonly used for canal lining?
5. List out different control structures used for irrigation water conveyance and briefly explain their functions.
6. Explain the advantages of underground pipeline system over open channel system.
7. The topographic survey of a field has the following elevations in metres at grid points. Calculate the elevation of the centroid of the field. If the field is going to be converted into a playground, calculate the cut and fill at grid points.

	Line 1	Line 2	Line 3
A	10.43	10.07	9.68
B	10.42	9.95	9.84
C	10.08	9.92	9.65
D	9.48	9.67	9.41

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

1. (a) Determine the net depth of water per application, the irrigation period, and the time required to irrigate a border strip 3 x100 m in sandy loam soil with moisture holding capacity of 10 cm per metre. A source of water discharging at the rate of 24,000 litres per hour is used to irrigate the field. The crop grown is wheat (Effective root zone -1m). Peak rate of water use is 5 mm/day

     (b) After how many days will you supply water to soil in order to ensure efficient irrigation of the given crop, if,

        (i)   Field capacity of soil – 27%

        (ii)   Permanent wilting point – 13%

        (iii)   Density of soil – 1.5 g/cm^3

        (iv)   Effective root zone – 75 cm

        (v)   Daily consumptive use – 8 mm

2. Briefly explain about the machineries used for land levelling and grading.

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