B.Tech 8th Semester Mid-Term Examination, 2018

Irrigation Engineering

Subject Code: 011X52

Time: 2 hours Full Marks: 20

Instructions:

(i) All questions carry equal marks.
*(ii) There are **Six** questions in this paper.*
*(iii)Attempt **Four** questions in all.*
(iv) Question No. 1 is compulsory.

1. Chose the correct option of the following (any five)

(a) The ratio of the water stored in the root zone of a crop to the water actually delivered to the crop in the field , is known as

(i) Water Conveyance Efficiency
(ii) Water Use Efficiency
(iii) Water Application Efficiency
(iv) Water Distribution Efficiency

(b) The method of growing crops on ridges, running on the sides of water ditches is known as

(i) Furrow Irrigation
(ii) Check Irrigation
(iii) Flood Irrigation
(iv) None of these

(c) Pick up the correct statement from the following:

(i) Gravity water is harmful to crops
(ii) Capillary moisture held in the soil pores against gravity by surface tension, is utilized by plants
(iii) Hygroscopic water remains attached to soil molecules by chemical bond
(iv) All the above

(d) The consumptive use of water for a crop

(i) Is measured as the volume of water per unit area

(ii) May be supplied partly by precipitation and partly by irrigation

(iii) Is measured as depth of water on irrigated area

(iv) All the above

(e) A Sprinkler Irrigation system is suitable when

(i) The soil is having low permeability

(ii) The crops to be grown have deep roots

(iii) The land gradient is steep and the soil is easily erodible

(iv) The water table is low

(f) Permanent Wilting Point moisture constant for a crop represents the

(i) Capillary Water

(ii) Hygroscopic Water

(iii) Available Water

(iv) Field Capacity Water

(g) The duty of a crop is 432 hectares/cumec, when delta for the crop is 200mm. What will be the base period of the crop

(i) 90 days

(ii) 100 days

(iii) 110 days

(iv) None of these

2. A stream of 140lps was diverted from a canal and 110lps were delivered to the field. An area of 1.65 ha was irrigated in 8 hours. The effective depth of root zone was 1.85 m. The runoff loss in the field was 435 m^3. The depth of water penetration varied linearly from 1.85 m at the head end of the field to 1.25 m at the tail end. Available moisture holding capacity of the soil is 25 cm/m depth of soil.

Determine:

(a) Water conveyance efficiency,

(b) Water application efficiency,

(c) Water storage efficiency and

(d) Water distribution efficiency

Irrigation was started at a moisture extraction level of 50 percent of the available moisture.

3. After how many days will you supply water to soil in order to ensure efficient irrigation of the given crop if,
    (a) Field Capacity = 27%
    (b) Permanent Wilting Point = 14%
    (c) Density of Soil = 1.5 g/cm3
    (d) Root Zone Depth = 75cm
    (e) Daily consumptive use of water for the given crop = 11mm.
4. A channel is to be designed for irrigating 6000 hectares in Kharif crop and 4500 hectares in Rabi crop. The water requirements for Kharif and Rabi are 55cm and 30cm respectively. The Kor period for Kharif and Rabi is 3 weeks and 4 weeks respectively. Find out the discharge of the channel for which it is to be designed.
5. What are the types of sprinkler irrigation system? Explain the advantages and disadvantages of sprinkler irrigation.
6. What do you mean by Duty, Delta and base period? How are they expressed? Derive the relationship.

BEST OF LUCK