53 (CE 716) IREN

2021

(Held in 2022)

IRRIGATION ENGINEERING

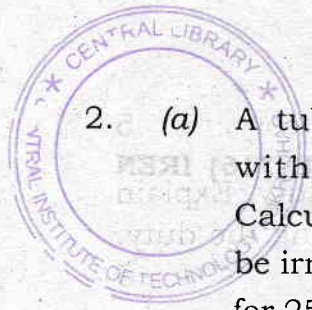Paper : CE 716

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* Define irrigation. List the benefits and ill effects of irrigation. 5

   (b) Differentiate between ridge canal and contour canal. 5

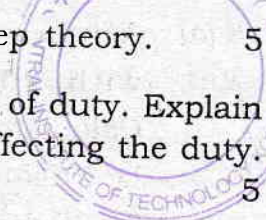   *(c)* Explain the procedure of designing a channel with Kennedy's theory. 10

2. (a) A tube well has discharge of $4\,m^3/hr$ with 20 hours working per day. Calculate the area required that can be irrigated by the tube well if operated for 25 days. The depth of water required is $8\,cm$.　　　5

(b) Design a channel section with the following data :

Mean diameter of silt particles = $0.3\,mm$, side slope = $1.5:1$, full supply discharge = 8 cumecs.　　　5

(c) Explain in brief canal losses.　　　5

(d) The gross command area of a crop field is 1.5 lakhs of which, 7000 is unculturable area, the area for Kharif crop is 60,000 and the area for Rabi crop is 40,000 respectively. Duty for Kharif crop is 3000 hectare/cumecs and for Rabi duty is 4000 hectare/cumecs. Determine — (i) design discharge of the channel (ii) intensity of irrigation for Kharif and Rabi crops.　　　5

3. (a) Elaborate Bligh's Creep theory. 5

(b) Classify various types of duty. Explain in brief, the factors affecting the duty. 5

(c) Discuss in brief, various methods of applying water to the crops. 10

4. (a) Distinguish between super passage and syphon aqueduct. 6

(b) Explain the function of canal head regulator. 4

(c) Define diversion headwork. List the objectives of diversion headwork. Classify cross drainage work. 10

5. (a) Compare— (i) surface irrigation and sub-surface irrigation (ii) ridge canal and contour canal. 12

(b) Briefly explain various types of falls. 8

6. Define the following terms : 20

Paleo irrigation, Streamline, Barrage, Kor watering, Gross command area, Rabi crop, Consumptive use, Exit gradient, Base period, Field capacity.

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