Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards) (Sem.–4)

IRRIGATION ENGINEERING-I

Subject Code : BTCE-405

Paper ID : [A1175]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a. Enlist the requirement of an ideal regime condition in Laceys regime theory.

b. Distinguish between Delta, duty and base period.

c. What is meant by water logging?

d. Define specific yield and specific retention of an aquifer.

e. What is deflecting groyne?

f. What is the optimum depth of kor watering for rice crop?

g. Enumerate the benefits of irrigation.

h. What is meandering of rivers and what are its causes?

i. In a given year for a certain irrigation project 78% and 36% of the cultural command area remained un-irrigated in Kharif and Rabi season respectively. Determine the intensity of irrigation for that year.

j. What do you understand by balancing depth?

SECTION-B

2. What is Sprinkler irrigation? Describe briefly the component parts of Sprinkler irrigation system.

3. Explain the cut-offs and its design considerations.

4. a) What is guide bank? Draw good sketch and explain it.

   b) Design lined canal to carry 200 cumec discharge with the following data :

      i) Angle of repose of soil = 45 degree

      ii) Lacey's silt factor = 2.2

      iii) B/D ratio = 3

      iv) Value of N = .018

5. What are multipurpose projects and what are the requirements of various objectives in a multipurpose project?

6. Determine the field capacity of a 1200 m^2 cropped area (root zone depth = 0.8 m) on which 400 m 3 of water was applied. The moisture content of soil before irrigation was 8% and dry density of soil is 1800 kg/m 3. Assume water losses = 12%.

SECTION-C

7. a) A 40 cm diameter well penetrates 30 m below the static water table. After 24 hours of pumping at the rate of 5500 litres/minutes, the water level at the test well at 100 m lowered by 0.45 m and in a well 40 m away the drawdown is 1.10 m. Determine transmissibility of the aquifer and drawdown in the main well.

   b) Describe how you would evaluate the economic feasibility of an irrigation projects.

8. Design a concrete lined channel to carry a discharge of 100 cumec with velocity of flow not exceeding 2 m/s. Given, bed slope = 1/2500, sides slope = 1.25 horizontal : 1 vertical and Manning's coefficient = 0.014.

9. Discuss the classification of river training works. Explain the design considerations of guide banks.