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. **Write briefly :**

   1. Enumerate the benefits of irrigation.

   2. Briefly describe border strip method of irrigation.

   3. What is a watershed canal and what are the advantages of such a canal?

   4. Draw the cross-section of a canal partly in cutting and partly in filling.

   5. What are the causes of water losses in a canal?

   6. What is waterlogging and what are its ill-effects?

   7. What is meant by tile drains and what are their advantages?

   8. Differentiate confined and unconfined aquifers.

   9. Define duty and delta of tubewell irrigation.

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

SECTION-B

2   Discuss sprinkler irrigation and what are its advantages.

3   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%.

4   Discuss the main features of Lacey's regime theory.

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

6   What are groynes and how are these classified?

SECTION-C

7   The following pattern is evolved under reservoir irrigation :

Crop	Season	Base period (days)	Outlet factor (ha/cumec)	Intensity (%)	Crop ratio
Sugarcane	Perennial	360	800	60	4
Paddy	Kharif	120	800	80	2
Cotton	Kharif	210	1200	60	2
Wheat	Rabi	120	1800	75	3
Vegetables	Summer	100	750	60	1

The gross commanded area is 30000 ha, out of which 80% is culturable.

Determine (i) capacity factor for the main canal (ii) design discharge at the head of main canal and (iii) capacity of the storage reservoir. Assume, extra water for the period of peak use = 20%. time factor = 13/20. Conveyance losses = 20%, evaporation and seepage losses in the reservoir = 10% and allowance for carryover storage of reservoir = 5%.

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   What is tubewell irrigation? What are the various types of tubewells? Describe the widely used type of a tubewell with a neat sketch.