

**B.Tech. CIVIL (WATER RESOURCES  
ENGINEERING)**

**Term-End Examination**

**December, 2012**

**ET-533 (A) : IRRIGATION ENGINEERING**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any five questions. All questions carry equal marks. use of calculator is permitted. Assume any data suitably , if not given.*

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1. Define the following : 7x2=14
- (a) Eutrophication
  - (b) Border irrigation
  - (c) Leaching
  - (d) Drainage
  - (e) Sprinkler irrigation
  - (f) Field capacity
  - (g) Infiltration.
2. (a) Briefly discuss the salient aspects of historical development of irrigation in India. 7
- (b) The food production of India has increased due to adoption of appropriate cropping patterns and modern technologies. Give critical comments. 7

3. (a) Define Evapo-transpiration. Give step by step procedure of Blaney-Criddle method for estimation of evapotranspiration. 7
- (b) The following data were obtained in determining the soil moisture content at successive depths in the root zone prior to applying irrigation water : 7

Depth of Sampling (cm)	Wt. of moist soil sample (gm)	Over dry wt. of soil sample (gm)
0-25	134.60	126.82
25-50	136.28	127.95
50-75	122.95	115.32
75-100	110.92	102.64

The bulk density of the soil in the root zone was 1.50gm/cc. The available moisture holding capacity of the soil was 17.8cm/m depth. Determine (i) the moisture content at the different depths in the root zone, (ii) net depth of water to be applied to bring the moisture content to field capacity.

4. (a) Describe sprinkler method of irrigation. List the advantages and limitations of this method. 9
- (b) Determine the required capacity of a sprinkler system to apply water at the rate of 1.25cm/hr. Two 186 metres long sprinkler lines are required. Sixteen sprinklers are spaced at 12m intervals on each line. The spacing between lines is 18m. 5

5. (a) Discuss in short the types of Land Forming. 3  
(b) Why land grading is needed? List the steps involved in land grading design. 5  
(c) Describe the constructional details of a grader with a neat sketch. 6
6. (a) Explain the principles of working of a centrifugal pump. 7  
(b) Discuss the criteria for the selection of pumps for irrigation. 7
7. Write short notes on the following :  $4 \times 3.5 = 14$   
(a) Four corner method in cutfill estimation.  
(b) India's water budget  
(c) Gravitational water and hygroscopic water  
(d) Tensiometer
8. Write short notes on the following :  $4 \times 3.5 = 14$   
(a) Green-Ampt model.  
(b) Contour benching  
(c) Water logging  
(d) Classification of Canals
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