

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE  
EXAMINATION, JUNE 2011**

CE 04 606—HYDROLOGY AND IRRIGATION ENGINEERING  
(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.  
Assume any missing data suitably.*

**Part A**

- I. (a) Explain hydrologic cycle with a neat sketch.  
 (b) Explain the catchment characteristics affecting run-off.  
 (c) Explain briefly different methods of flood control.  
 (d) List the factors influencing the selection of a reservoir site.  
 (e) Discuss the factors influencing the water requirement of crops.  
 (f) Discuss various types of weirs in detail.  
 (g) What is a contour canal ? How is the alignment of main canal fixed ?  
 (h) List the causes of losses in irrigation channels.

(8 × 5 = 40 marks)

**Part B**

- II. (a) Explain the procedure for checking a rainfall data for consistency. (8 marks)  
 (b) The annual rainfall recorded by eight rain gauges, in a gear in a catchment is given below :

| Station        | ... | A     | B     | C     | D     | E     | F     | G   | H   |
|----------------|-----|-------|-------|-------|-------|-------|-------|-----|-----|
| Rainfall (cm.) | ... | 130.1 | 138.2 | 143.5 | 127.6 | 119.8 | 129.0 | 134 | 141 |

For a 5 % error in the estimation of the mean rainfall, calculate the minimum number of additional stations required to be established in the catchment.

(7 marks)

*Or*

- (c) Explain unit hydrograph theory. Explain the applications and limitations of unit hydrograph. (15 marks)

- III. (a) What is meant by flood plane zoning ?  
 (b) Discuss the objects of river training.  
 (c) Explain the causes and remedial measures of reservoir sedimentation.

(3 × 5 = 15 marks)

*Or*

- (d) Explain the various flood control measures used to practice.

(15 marks)

Turn over

- IV. (a) Define Field capacity, Root zone and Crop period. (6 marks)
- (b) An irrigation canal has a cultivable commanded area of 2600 hectares. Intensity of irrigation for perennial sugar-cane and paddy are 20 % and 40 % respectively. Duty for these crops are 800 hectares/cumec and 1800 hect/cumec. respectively. Compute the discharge required at the head of canal, if the conveyance loss is 15 % and peak demand is 20 % more than the average demand.

(9 marks)

*Or*

- (c) Write short notes on :
- (i) Water requirements of crops.
  - (ii) Irrigation efficiencies.
  - (iii) Silt excluder and silt extractor.

(3 × 5 = 15 marks)

- V. (a) Explain briefly the classification of canals. (6 marks)
- (b) Design an irrigation channel in alluvial soil according to Lacey's silt theory using the following data :

Full supply discharge = 15 m<sup>3</sup>/s

Lacey's silt factor = 1.0

Channel side slopes = 0.5 : 1.

(9 marks)

*Or*

- (c) Explain with the help of neat sketches the layout of a file drain system. (8 marks)
- (d) Explain the advantages and disadvantages of canal lining. (7 marks)

[4 × 15 = 60 marks]