

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE  
EXAMINATION, DECEMBER 2010**

CE 04 606—HYDROLOGY AND IRRIGATION

Time : Three Hours

Maximum : 100 Marks

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

**Part A**

1. (a) Write a note on watershed.
- (b) Explain the methods of measurement of precipitation.
- (c) What is meant by meandering of rivers ? What are the causes of meandering ?
- (d) Explain the various methods for controlling reservoir sedimentation.
- (e) Explain the necessity of irrigation.
- (f) Define field capacity, root zone depth and crop period.
- (g) Explain flood routing.
- (h) Explain high water training, low water training and medium water training.

(8 × 5 = 40 marks)

**Part B**

2. (a) Explain the detail mass inflow curve and hyetograph. (8 marks)
- (b) Explain the procedure for checking a rainfall data for consistency. (7 marks)

*Or*

- (c) Define yield of a basin. Explain the method of estimating maximum run-off by rational method.

(15 marks)

3. (a) Explain the objectives of river training. (7 marks)
- (b) Explain any two methods of flood control measures. (8 marks)

*Or*

- (c) Explain how the storage capacity of a reservoir is fixed for a given demand using mass inflow curves.

(7 marks)

- (d) List the various formulae to obtain the peak discharge and discuss their limitations.

(8 marks)

4. (a) Classify the following crops according to their growing seasons :—

Wheat, rice, sugar-cane, potato, maize, cotton, grams.

(5 marks)

**Turn over**

- (b) A field channel has culturable commanded area of 2000 hectares. The intensity of irrigation for gram is 30 % and for wheat is 50 %. Gram has a base period of 18 days, and delta of 120 mm., while wheat has a base period of 15 days and delta of 150 mm. Calculate the discharge required for the field channel.

(10 marks)

Or

- (c) Explain storage and diversion head works. (7 marks)
- (d) Explain the design of impervious aprons for a vertical drop weir. (8 marks)
5. (a) Explain causes of silting in canals and how to prevent the same. (6 marks)
- (b) Design an irrigation channel in alluvial soil to carry a discharge of  $30 \text{ m}^3/\text{s}$ . The side slopes are  $\frac{1}{2} \text{ H}$  to  $1 \text{ V}$ . Assume Lacey's silt factor as 1 and use Lacey's theory for the design. (9 marks)

Or

- (c) Explain briefly the design and maintenance of open drains. (8 marks)
- (d) Describe the methods of reclaiming the water logged areas for irrigation. (7 marks)

[4 × 15 = 60 marks]