G 395

(Pages : 3)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Sixth Semester

Branch : Civil Engineering

CE 010 605—WATER RESOURCES ENGINEERING (CE)

(New Scheme—2010 Admission Onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each questions carries 3 *marks.*

1. What are the different types of irrigation systems ?
2. Define hydrologic cycle. What are the components of hydrologic cycle ?
3. Define the terms specific yield and specific retention.
4. State the major functions of a canal head regulator.
5. What do you understand by mass inflow curve ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each questions carries 5 *marks.*

6. Explain the terms 'duty' and 'delta'. Derive a relationship between the two.
7. Define Runoff. Discuss the factors affecting runoff.
8. Explain the terms : (i) Aquifer ; (ii) Aquiclude ; (iii) Aquitard ; and (iv) Aquifuge.
9. What is a canal outlet ? What are the requirements of a canal outlet ?
10. With a neat sketch, explain the different zones of storage of a reservoir.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. (a) Define Irrigation. Discuss the necessity of Irrigation. (7 marks)

    (b) Define the terms : (i) GCA ; (ii) CCA ; (iii) kor depth ; (iv) kor period ; and (v) outlet factor. (5 marks)

Or

Turn over

12. (a) Briefly explain various Irrigation efficiencies. (5 marks)

(b) A certain crop is grown in an area of 4000 hectares which is fed by a canal system. The data pertaining to irrigation are as follows.

Field capacity of soil	=	25%
Optimum moisture	=	12%
Permanent wilting point	=	10%
Effective depth of root zone	=	90 cm
Relative density of soil	=	1.4

If the frequency of irrigation is 12 days and overall efficiency is 25%, find :

(i) Daily consumptive use.

(ii) The water discharge in m^3/sec required in the canal feeding the area.

(7 marks)

13. (a) What is meant by Precipitation ? Explain any *one* method of measuring precipitation. (6 marks)

(b) What is meant by a Hydrograph ? With the help of a neat sketch, explain the essential components of a single peaked hydrograph. (6 marks)

Or

14. (a) Describe the various methods for computing average rainfall over a drainage basin. (7 marks)

(b) Define Φ Index. How is it determined from the rainfall hyetograph ? (5 marks)

15. (a) Explain Darcy's law. What are its assumptions ? Discuss its validity. (5 marks)

(b) Derive an expression for discharge from a well in an unconfined aquifer. The well fully penetrates in it. (7 marks)

Or

16. Describe various types of open wells and tube wells. (12 marks)

17. (a) Explain how the canals are classified based on different criteria. (6 marks)

(b) Describe the procedure for designing an irrigation channel using Kennedy's theory. (6 marks)

Or

18. (a) Design an irrigation channel in alluvial soil to carry a discharge of 30 m^3/sec. The side slopes are ½ H to 1 V. Assume Lacey's silt factor as 1 and use Lacey's theory for design. (6 marks)

(b) What are the causes of silting in canals? Explain how to prevent the same. (6 marks)

19. (a) Discuss in brief the various investigations required for reservoir planning. (6 marks)

(b) Explain briefly how you will determine the reservoir capacity using mass inflow curve. Assume rate of demand as constant. (6 marks)

Or

20. (a) What is meant by river training ? List the various objectives of river training. (6 marks)

(b) Write a note on reservoir sedimentation. (6 marks)

[5 × 12 = 60 marks]