

B.Tech. CIVIL ENGINEERING (BTCLEVI)**Term-End Examination****December, 2015****BICEE-015 : WATER RESOURCES SYSTEM
PLANNING AND DESIGN***Time : 3 hours**Maximum Marks : 70*

Note : Answer any seven questions. All questions carry equal marks. Use of scientific calculator is allowed.

1. What are the various issues related to water systems engineering ? Discuss in detail. 10
2. What are the different water resource development alternatives ? Explain. 10
3. Discuss the various constraints and criteria in water systems engineering. 10
4. What is the purpose of stochastic planning and management ? Discuss using a relevant example. 10

5. The area of the small drainage basin is 500 ha and is under different land use categories as given below :

<i>Land use category</i>	<i>Area (ha)</i>	<i>Runoff coefficient</i>
Wooded steep rocky land	130	0.8
Lightly covered plateau land	60	0.7
Lightly covered clayey soil	110	0.5
Cultivated loamy soil	90	0.3
Sandy soil covered sparsely	110	0.2

The rain storm lasted 5 hrs producing 30 cm rainfall. The farthest point from the drainage outlet is 10 km away and the difference in elevation between the locations is 100 m.

Using rational formula, calculate the peak flow for the given catchment. 10

6. What do you understand by multi-objective planning? Explain in detail using a relevant case study. 10
7. Discuss the Linear programming and Dynamic programming models employed in water resources systems, along with their applications. 10
8. How does Hierarchical approach help in planning of ground water systems? Discuss in detail. 10

9. Write short notes on the following : 2×5=10

- (a) Water quality management planning
- (b) Institutional aspects of water resource planning and management.

10. What are the various policy issues faced by ground water system planners ? Explain in detail.

10
