

**SEMESTER EXAMINATION,  
2022-23 YEAR**

Programme – Ist Yr. M.Tech – INFRASTRUCTURE ENGINEERING

**Water Resources System Planning an Management**

**Duration : 3:00 hrs**

**Max Marks: 100**

Note:-Attempt all questions. All Question carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption mad in the answer.

Q 1. Answer any four parts of the following.

- (a) Define the concept of systems analysis.
- (b) Describe about various types of optimization techniques.
- (c) Draw the flowchart of role of models in the planning process and explain it.
- (d) Explain briefly about simplex method
- (e) Discuss the various applications of linear programming in water resources.
- (f) Write statement of the Bellman's principle of optimality.

Q 2. Answer any four parts of the following.

- a) Describe about backward recursion and forward recursion with neat diagrams.
- b) Define the term "simulation". Differentiate between linear models and routing models.
- c) Write down the applications of simulation techniques in water resources.
- d) Specify the concept of optimal cropping pattern.
- e) Discuss the various advantages of conjunctive use of water.
- f) Explain the method of determination of optimum number of raingauges in a catchment

Q 3. Answer any two parts of the following.

- a) A trapezoidal channel of bed width 4 m and side slope 1 : 1 carries water at a depth of 2 m. The rate of evaporation observed was 0.35 mm/m<sup>2</sup> /h. Find the daily loss due to evaporation from the canal in a length of 10 km in ha m
- b) Describe the vertical distribution of ground water.
- c) Stating the assumptions underlying it, derive the Dupuit's equation for steady radial flow into unconfined aquifers.
- d) Define safe yield and average yield of reservoirs.
- e) Give consequences and effects of Epidemics.
- f) Write short note on National Disaster Management Policy.

Q 4. Answer any two parts of the following.

- a) Preventive and Protective Measures against Avalanche
- b) Explain disaster risk mapping.
- c) Explain Yokohama Strategy.

Q 5. Answer any two parts of the following.

- a) What is the role of National Executive Committee (NEC) at state level and at district level.
- b) How can we make buildings resistant to earthquakes with earthquake engineering.
- c) Explain various major disasters in INDIA in detail.