

Total No. of Questions : 12]

SEAT No. :

P2002

[4759]-10

[Total No. of Pages : 3

**B.E. (CIVIL ENGINEERING)
HYDROINFORMATICS
(2008Course) (Elective-II) (Semester-I)**

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Answer any three questions from each section .*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right side indicate full marks.*
- 5) *Use of Calculator is allowed.*
- 6) *Assume Suitable data if necessary*

SECTION-I

- Q1)** a) Enlist the basic scientific disciplines of hydro informatics and explain important aspects of each on which hydro informatics is based. [6]
- b) Enumerate scope of internet and web based modeling in water resources engineering. [6]
- c) A commercial Hydroinformatics system is to be formed for managing reservoir operation with respect to release of water for an irrigation system and for domestic use for a small town what components you suggest, explain with justification. [6]

OR

- Q2)** a) Discuss about design of hydro informatics system for information regarding availability of surface water in a particular area. [6]
- b) Discuss the role of internet in rainfall forecasting system. [6]
- c) Compare numerical modeling and soft computing modeling in Hydroinformatics [6]

- Q3)** a) What is a decision support system in water resources engineering? What are its components? What is the role of government sector in decision support system?. [8]
- b) Enlist the various components of multi-criteria decision support system and explain the inter dependency of every component on each other. [8]

OR

P.T.O.

Q4) a) Name different software used in Hydroinformatics. Explain any one of them in detail. [8]

b) Discuss design of multi - criteria decision support system for drought watch giving details of information collection, analysis, prediction, estimation, decision, dissemination of the information. [8]

Q5) a) Differentiate between physics based modeling and data driven modeling. Give examples of each. [8]

b) Discuss design of simulation model for reservoir inflow at a dam location objective, scope, basic formulae used, underlying solution procedure, and simulation technique used. [8]

OR

Q6) a) What are different data driven techniques? How these techniques can be applied for development of water resources. [8]

b) Discuss design of simulation model for household sewage collection system giving details of objective, scope, basic formulae used, underlying solution procedure and simulation technique used. [8]

SECTION II

Q7) a) Write detail note on recurrent network. [6]

b) Define normalization in Artificial neural network. What is the importance of normalization? What are typical ranges of normalization? [6]

c) Discuss conjugate gradient algorithm in detail. [6]

OR

Q8) a) What is over fitting of neural network? Explain in detail how it is avoided. [6]

b) How artificial neural networks compare with statistics? What is the terminology used in statistics for the following terms used in ANN? Input, output, training, generalization. [6]

c) Explain in detail the step wise procedure for carrying out cross validation. [6]

Q9) a) Discuss parents and children, fitness values and best fitness values with respect to genetic algorithm. [8]

b) What are Genetic operators? Explain any two of them in details. [8]

OR

Q10)a) Summarize the working of Genetic algorithm. [8]

b) What is real coded Genetic Algorithm? How it differs from standard Genetic Algorithm? [8]

Q11)a) Discuss limitations of ANN With respect to data requirement, magnitude of data, selection of architecture and lack of physical concept. [8]

b) Write the working principle of Genetic Algorithm and enlist various applications of Genetic Algorithm in Water Resources Engineering. [8]

OR

Q12)a) Write detail note on applications of Artificial Neural Networks in stage discharge modeling. [8]

b) What is the importance of 'fitness function' in Genetic Algorithm. And explain the operation, reproduction, cross over and mutation of Genetic Algorithm. [8]

