

Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages : 3

P1681

[4859]-10

B.E. (Civil)

b-HYDROINFORMATICS

(Elective-II) (2008 Course) (Semester - I) (401005)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer to the two sections should be written in separate answer-books.*
- 2) *Your answer will be valued as a whole.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 5) *Answer suitable data, if necessary.*
- 6) *Answer three questions from section-I and three questions from section-II.*

SECTION - I

- Q1)** a) Define Hydroinformatics. What is the necessity of Hydroinformatics? Explain with practical example. [6]
- b) What are components of hydroinformatics systems? Explain in detail hardware and software components. [6]
- c) Discuss about design of hydroinformatics system for flood warning in your city. [6]

OR

- Q2)** a) What are network components, peripheral components of a Hydroinformatics system? Explain in brief. [6]
- b) Discuss any web based hydroinformatics system in India or abroad giving details about scope, purpose, underlying model, software used in front end and back end. [8]
- c) Explain role of numerical modeling in Hydroinformatics. [4]

- Q3)** a) Why multi-criteria decision support systems are required in Hydraulic Engineering? Discuss interrelation between various components of multi-criteria decision support system. [8]
- b) Discuss design of multi-criteria decision support system for wave watch giving details of information collection, analysis, prediction, estimation, decision-dissemination of the information. [8]

OR

P.T.O.

- Q4)** a) What is a decision support system in water resources engineering? What are its components? What is the role of public sector in decision support system? [8]
- b) Discuss design of multi-criteria decision support system for flood 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. [6]
- b) Discuss design of simulation model for household water distribution system giving details of objective, scope, basic formulae used, underlying solution procedure, simulation technique used. [10]

OR

- Q6)** a) Discuss any commercial simulation model. [6]
- b) Discuss design of simulation model for water inflow at a dam location objective, scope, basic formulae used, underlying solution procedure, simulation technique used. [10]

SECTION - II

- Q7)** a) Discuss the working of biological neuron. [4]
- b) What is learning rate? What is momentum factor? [6]
- c) 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. [8]

OR

- Q8)** a) Discuss the working of an artificial neuron. [4]
- b) Define epoch, epoch size, error function, weight surface. [6]
- c) Define transfer function. What is its use in ANN? Discuss various transfer used in ANN. [8]

- Q9)** a) What is evolutionary computing? Explain 3 criteria for evolutionary process to occur. What are different types of evolutionary computing? [8]
- b) Discuss fitness function, population, terminals and functions in connection with the Genetic Algorithm. [8]

OR

- Q10)** a) What is mutation and cross over? Give an example of both by drawing the tree diagram. [8]
- b) What are the steps in implementation of Genetic Algorithm? [8]

- Q11)a)** What are strengths and limitations of Artificial Neural Networks. [8]
- b) Define soft computing techniques. Is Genetic Algorithm a soft computing technique? Why? What is the difference between Genetic Algorithm and Genetic programming? [8]

OR

- Q12)a)** Discuss a study about application of Artificial Neural Networks in Water Resources Engineering giving details about problem definition, objective, data, inputs, outputs, algorithm used and results. [8]
- b) Discuss a study about application of Genetic Algorithm in water Resources Engineering giving details about problem definition, objective, data, inputs, outputs and results. [8]

