Total No. of Questions : 12]

SEAT No. :

P2642

[Total No. of Pages : 3

[5154]-10
B.E. (Civil Engineering)
HYDROINFORMATICS
(2008 Pattern) (Semester - I) (Elective - II) (401005 B)

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) Define Hydroinformatics. What are the techniques used in Hydroinformatics? Explain any one in short. **[6]**

b) Explain scope of web based modeling in water resources engineering. **[6]**

c) Discuss about design of hydro informatics system for information regarding availability of ground water in a particular area. **[6]**

OR

Q2) a) Discuss the role of internet in rainfall forecasting system. **[6]**

b) A commercial hydroinformatics system is to be formed for managing reservoir operation with respect to release of water for an hydro electric power plant, what components you suggest, explain with justification. **[6]**

c) Explain role of numerical modeling in Hydroinformatics. **[6]**

Q3) a) A multi-criterion decision support systems is to be designed to collect information regarding availability of water resources viz. surface water, ground water, etc. in a tahsil, frame various alternative schemes. **[8]**

b) You have to design a graphical user interface for flood watch system, explain the front end and back end parameters. **[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 private sector in decision support system. **[8]**

b) Discuss various methods of simulations in Hydroinformatics. **[8]**

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

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

OR

Q6) a) Discuss possible simulation model for predicting stream flow in a river. **[8]**

b) Discuss design of simulation model for water release from a dam with respect to objective, scope, basic formulae used, underlying solution procedure, simulation technique used. **[8]**

SECTION - II

Q7) a) What is back propagation? Why it is slow compared to conjugate gradient algorithm? **[6]**

b) How artificial neural networks compare with statistics? What is the terminology used in. **[6]**

c) Define cross validation. State step by step procedure for carrying out the same. **[6]**

OR

Q8) a) Define a transfer function. Discuss various types of transfer functions. **[6]**

b) What is normalization? What is its need? What are typical ranges of normalization? **[6]**

c) What is the necessity of cross validation in ANN modeling? Explain any method of cross validation in detail. **[6]**

Q9) a) What is real coded Genetic Algorithm? How it differs from standard Genetic Algorithm? **[8]**

b) Why Genetic Algorithm is used as an optimizing function? Can it be used to train a neural network? How? **[8]**

OR

Q10)a) What are different types of evolutionary computing? Discuss the Genetic Algorithm approach in detail. **[8]**

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

Q11)a) Discuss a study about application of Artificial Neural Networks in Water Resources Engineerine giving details about problem definition, objective, data, inputs, outputs, algorithm used and results. **[8]**

b) State advantages of Genetic Algorithm over traditional methods. **[8]**

OR

Q12)a) Discuss limitations of ANN with respect to data requirement, magnitude of data, selection of architecture and lack of physical concept. **[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]**