Total No. of Questions : 12]

SEAT No. :

P3959

[Total No. of Pages : 3

[5254]-10
B.E. (Civil Engineering)
HYDROINFORMATICS
(2008 Pattern) (Elective - II)

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) Compare numerical modeling and soft computing modeling in Hydroinformatics. **[6]**

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

c) What are components of Hydroinformatics systems? Explain in detail different hardware and software components of Hydroinformatics systems. **[6]**

OR

Q2) a) 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. **[6]**

b) 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]**

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

Q3) a) Discuss design of multi - criteria decision support system for flood control giving details of information collection, analysis, prediction, estimation, decision- dissemination of the information. **[8]**

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b) You have to design a graphical user interface for drought forecasting system, explain the front end and back end parameters. **[8]**

OR

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) 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 district, frame various alternative schemes. **[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 water distribution system giving details of objective, scope, basic formulae used, underlying solution procedure, simulation technique used. **[8]**

OR

Q6) a) Discuss any commercial simulation model for two dimensional flow modeling. **[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]

SECTION - II

Q7) a) Enlist different algorithms of ANN. Which one is the fastest? Why? Explain in detail FFBP in detail. **[6]**

b) Discuss the working of biological neuron and artificial neuron. Distinguish between them. **[6]**

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

OR

Q8) a) What is validation and testing? Why it is necessary? Can either of them suffice the each other's purpose while developing a model using any soft computing technique? **[6]**

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

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

Q9) 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]**

OR

Ql0)a) Why Genetic Algorithm is used as an optimizing function? Can it be used to train a neural network? How? **[8]**

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