

UNN 4213

M.E. DEGREE EXAMINATION, 2004

(THIRD SEMESTER)

**(ENVIRONMENTAL, STRUCTURAL & WATER
RESOURCES ENGINEERING & MANAGEMENT)**

**WREE - 301 / ENVC - 302 / SEE 200 (B)
GIS FOR WATER RESOURCES AND
ENVIRONMENTAL SYSTEMS**

(Elective)

(Common with Part - Time)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any FIVE full questions.

All questions carry equal marks.

1. Explain the scope of remote sensing and GIS in water resources systems with suitable examples.
2. Give a detailed algorithm for a rain-fall run - off modelling of your choice, highlighting the use of remote sensing inputs.
3. "The Veeranam irrigation system performance is planned to be assessed" - Give your detailed programme to carry out the same with an integration of Remote sensing and GIS data.
4. Distinguish between water-shed development and water - shed management. Explain the use of GIS for water - shed management.
5. "Pichavaram mangroves are to be safeguarded for an ecological system sustenance" - Explain, how you would carry out this task with the use of R.S. and GIS.
6. Write notes on any THREE of the following : (3 × 4 = 12)
 - (a) Geomorphological mapping.
 - (b) Land use mapping.
 - (c) Flood plane zoning
 - (d) Flood inundated area evaluation models.
7. Write notes on any THREE of the following : (3 × 4 = 12)
 - (a) Crop yield estimation.
 - (b) Agricultural drought.
 - (c) Catchment area treatment.
 - (d) Reservoir sedimentation.
8. Write notes on any THREE of the following : (3 × 4 = 12)
 - (a) Snow melt run - off estimation.
 - (b) Urban storm water studies.
 - (c) Non - Point source pollution.
 - (d) Solid waste management.

- VI. (a) Describe the ANFIS architecture. How Hybrid algorithm is employed in ANFIS? (6)
- (b) Explain ANFIS architecture of two input single output sugeno fuzzy inference model. (6)
- VII. Explain how ANFIS can be employed to predict future values of a chaotic time-series with an example. (12)
- VIII. Write notes :
- (a) Network architecture.
- (b) Neurons.
- (c) Mc Culloch - Pitts Neuron Model.
- (d) Hebbian learning. (12)

- (ii) Fuzzy sets with a discrete ordered universe.
- (iii) Fuzzy sets with a continuous universe. (9)
- II. (a) Define the terms :
- (i) Crispness.
- (ii) Fuzziness.
- (iii) Convexity. (6)
- (b) Explain Fuzzy "If - Then" rules with suitable examples. (6)
- III. Explain Max - min and max - product composition

Let $R_1 = "x \text{ is relevant to } y"$

$R_2 = "y \text{ is relevant to } z"$

be two fuzzy relations defined on $X \times Y$ and $Y \times Z$ respectively, where $X = (1, 2, 3)$, $Y = (\alpha, \beta, \gamma, \delta)$ and $Z = (a, b)$.

Register Number :

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M.E. DEGREE EXAMINATION, 2004

(THIRD SEMESTER)

(WATER RESOURCE ENGINEERING AND MANAGEMENT)

WREE - 302.

NEURO - FUZZY APPLICATIONS IN CIVIL ENGINEERING

(Common with Part - Time)

(Elective)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer FIVE full questions.

All full questions carry equal marks.

(5 × 12 = 60)

- I. (a) Define - Neuro - fuzzy computing. (3)
- (b) Give example for
- (i) Fuzzy sets with a discrete non-ordered universe.

Assume R_1 and R_2 can be expressed as the following relation matrices :

$$R_1 = \begin{bmatrix} 0.1 & 0.3 & 0.5 & 0.7 \\ 0.4 & 0.2 & 0.8 & 0.9 \\ 0.6 & 0.8 & 0.3 & 0.2 \end{bmatrix}$$

$$R_2 = \begin{bmatrix} 0.9 & 0.1 \\ 0.2 & 0.3 \\ 0.5 & 0.6 \\ 0.7 & 0.2 \end{bmatrix}$$

Find $R_1 \circ R_2$.

- IV. Give step by step procedure for the Error - Back Propagation Training Algorithm (EBPTA). (12)
- V. (a) Explain the construction of a feed forward (Exclusive - OR) XOR 2-layer (3-layer counting input field) neural network, using back propagation (BKP) to train the network. (6)
- (b) Write about Perception Learning Rule and Competitive Learning Rule. (6)

Register Number:

3545

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M.E. DEGREE EXAMINATION, 2008
(WATER RESOURCES ENGINEERING AND
MANAGEMENT / ENVIRONMENTAL ENGINEERING)
(THIRD SEMESTER)

WREE-301. GIS FOR WATER RESOURCES AND
ENVIRONMENTAL SYSTEMS AND
ENVIRONMENTAL ENGINEERING

(Common with Part Time)

November]

[Time : 3 Hours

Maximum : 60 Marks

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Answer any FIVE questions

1. How water resources potential is estimated using GIS and remote sensing application? (12)
2. What are Geomorphological studies? How are these studies carried out using GIS and remote sensing? (12)
3. Draught assessment can be done using evaluation models – Comment on this. (12)
4. What are the parameters responsible for erosion and deposition in catchment area? How the treatment is due to this? How GIS and RS useful in this studies. (12)
5. Give short notes on
 - a) Estimation of sediment load
 - b) Land use mapping
 - c) Snow cover studies (12)
6. What parameters are taken into watershed management and water shed development? How GIS is applied to this area? (12)
7. Give notes an GIS application on
 - a) Solid waste management
 - b) Wetlands
 - c) Rainfall runoff modeling. (12)
8. What are the models available for storm water studies? Comment on the application of GIS in urban storm water studies. (12)

Register Number:

3532

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2008

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**(WATER RESOURCES ENGG AND
MANAGEMENT/ENVIRONMENTAL ENGG)**

(THIRD SEMESTER)

WREE-206/ENME-301.WATER QUALITY MODELLING

(Elective)

(Common with Part Time)

ANSWER ANY FIVE QUESTIONS

Nov)

(Time: 3 Hours)

Maximum: 60 Marks

1. How mathematical models are useful in solving the realtime problems. Give an example of the problems and solve them by any one model. (12)
2. Derive the model for oxygen sag and discuss its limitations and applications. (12)
3. Describe Lagrangion Model in river Water Quality Studies. (12)
4. What are the parameters that affect Lake Water quality? Describe one lake water model along with the above said parameters. (12)
5. Define hydraulics of Estuarine Model. How estuarine models are useful in deciding Water Quality? (12)
6. Name the different parameters governing ground water quality models. Describe the model for the mass transport in Ground Water. (12)
7. Describe the dilution techniques in the discharge of Wastewater in Marine Environment. (12)
