3. What are algorithms ? Explain shortest path by BFS and DFS. **16**

Unit II

4. What is augmenting path ? Explain Edmond's Blossom algorithm with a suitable example. **16**

5. Explain Maxflow-mincut theorem and Strassen's Algorithm with suitable example. **16**

Unit III

6. What is dynamic programming ? Explain Floyd-Warshall algorithm and give *two* more examples of dynamic programming. **16**

7. Explain Chinese Remainder Theorem and write its applications. **16**

Unit IV

8. Write about the recent trends in problem solving paradigm using recent searching and sorting techniques by applying recent data structures. **16**

9. Explain NP-completeness with examples and prove NP hardness. **16**

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M.Tech. (CSE) EXAMINATION, May 2023

(Second Semester)

PROGRAMME CORE-III

MT-CSL-201

Advanced Algorithm

Time : 3 *Hours* *Maximum Marks :* 80

Note : Q. No. **1** is compulsory. Attempt any *four* questions selecting *one* question from each Unit. All questions carry equal marks.

1. Write on the following : **2×8=18**
   (a) Bubble sort
   (b) Merge Sort
   (c) DFT
   (d) Interpolation problem
   (e) Minimum Spanning Tree
   (f) Applications of MST
   (g) Time Complexity
   (h) Randomized Algorithm.

Unit I

2. What is Sorting ? Explain topological sorting. **16**

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M. Tech. (CSE) EXAMINATION, May 2023

(Second Semester)

Programme Core-IV

MT-CSE-202

SOFT COMPUTING

Time : 3 *Hours* *Maximum Marks :* 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory.

1. Explain the following : **2×8=16**

(a) Unsupervised learning in ANN

(b) Intersection operation on fuzzy relations

(c) Benefits of genetic algorithms

(d) Advantages of optimization

(e) Classic sets *vs* fuzzy sets

(f) List the method of selection in GA and explain any *one*.

(g) Write steps to run a python script.

(h) Define the scope and life-time of a variable in Python.

Unit I

2. (a) Compute the simple disjunctive sum, disjoint sum, simple difference, and bounded difference of the sets : **8**

$A = \{(x, 0.5), (y, 0.4), (z, 0.9), (w, 0.1)\}$

$B = \{(x, 0.4), (y, 0.8), (z, 0.1), (w, 1)\}$

(b) Differentiate between soft computing and hard computing. **4**

(c) What is Machine Learning ? How does machine learning work ? **4**

3. (a) Write a note on journey from conventional AI to computational intelligence. **8**

(b) Write a short note on aggregation of fuzzy rules and explain about determination of aggregation strategy. **8**

Unit II

4. (a) What is Perceptron ? Write the difference between Single Layer Perceptron (SLP) and Multilayper Perceptron (MLP). **8**

(b) Write the differences between Auto-Associative and Hetero-Associative memories. **4**

(c) Write a note on recent advancements in neural networks. **4**

5. (a) Explain the architecture and components of Competitive Learning Neural Network with a neat diagram. **8**

(b) What are the advantages of using Radial basis Neural network over multilayer perceptron. **4**

(c) Explain the operating principle of adaptive resonance theory. **4**

Unit III

6. How is GA different from traditional methods ? Explain different types of mutations and crossover operators used in GA. **16**

7. (a) Discuss the role of **3+3+2**

(i) Selection

(ii) Cross-over

(iii) Mutation

in context of genetic algorithm.

(b) Write the applications of GA in machine learning. **8**

Unit IV

8. (a) Write in detail about any *two* recently proposed soft computing techniques. **8**

(b) How can we neural network toolbox of MATLAB to get details of classification of data ? **8**

9. (a) Write the *four* recent trends in deep learning. Also give the example of each. **8**

(b) How can we solve classification tasks with unbalanced data sets on Matlab Neural Network Toolbox ? **8**

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M. Tech. (CSE) EXAMINATION, May 2023

(Second Semester)

AUDIT COURSE-II

MT-AV-201

Disaster Management

Time : 3 *Hours* *Maximum Marks :* 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. Define the following : **8×2=16**

(i) Flood plains

(ii) Richter scale

(iii) Tides

(iv) Swell

(v) Cinder cone

(vi) Epicenter

(vii) River terrace

(viii) Lava.

Unit I

2. Discuss in detail the various types of rapid onset disasters which are caused due to endogenetic earth processes. **16**

3. Write notes on the following :

(a) Droughts and famines **8**

(b) Slow onset disasters **8**

Unit II

4. Discuss the geographical distribution of different seismic zones of India. **16**

5. Discuss in detail the origin, types and effects of tropical cyclones along with their geographical distribution in context to India. **16**

Unit III

6. Discuss the role of remote sensing in the identification, prediction and assessment of probable effects and management of natural hazards associated with Tsunamis and floods. **16**

7. Write a note on the role of media, government agencies and community for preparing for the disasters. **16**

Unit IV

8. Elaborate the different strategies which are adopted for the disaster mitigation resulting from a nuclear meltdown. **16**

9. Discuss in detail the efforts made towards global co-operation for risk assessment and warning for the Tsunamis across different oceans. **16**