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Total No. of Questions : 09

Total No. of Pages : 0

B.Tech. (CSE/ECE) (Sem.-7,8)

SOFT COMPUTING

Subject Code : BTEC-908D-18

M.Code : 90681

Date of Examination : 19-12-2024

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a. What do you mean by supervised and unsupervised learning?
- b. What is the difference between soft and hard computing?
- c. What is the importance of fitness function?
- d. Differentiate between crisp and fuzzy set theory.
- e. What is the principle used behind ant-based routing?
- f. How fuzzy sets are defined in Fuzzy Logic?
- g. Explain the concept of Widrow-Hoff rule.
- h. What is rule based learning?
- i. What do you mean by mutation?
- j. Define any two fuzzy set operations with example.

SECTION-B

2. Explain the crossover technique in uniform and three parent cross over.
3. Explain with example different types of operators involved in simple GA.
4. Explain different defuzzification techniques.
5. Explain how animal behaviour in shoals of fish is used for Swarm Intelligence?
6. Explain training algorithm used in adaptive linear neuron.

SECTION-C

7. **Explain:**
 - a) McCulloch Pitts neuron model
 - b) Application of NN for face Recognition.
8. Explain the characteristics and different classifications of a neuro-fuzzy hybrid system.
9. Implement OR function using perceptron training algorithm with binary inputs and bipolar targets.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE/ME/ECE) (Sem.-7,8)
MAINTENANCE AND RELIABILITY

Subject Code : BTME617/18

M.Code : 90485

Date of Examination : 17-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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 - SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

- 1. Write briefly :**
- a) Write the need for maintenance of record keeping.
 - b) What do you mean by cost of machine breakdown?
 - c) What do you mean by manpower training in maintenance?
 - d) Define predictive maintenance.
 - e) Write various housekeeping practices.
 - f) Write safety aspects of maintenance.
 - g) Discuss the concept of reliability.
 - h) What do you mean by reliability of series elements?
 - i) Write applications of reliability in design.
 - j) What is cut set method fault tree analysis?

SECTION-B

2. Discuss the need and importance of maintenance planning in an industry.
3. How you arrive at the economic life of a machine by considering the time value of money? Discuss.
4. What is the role of maintenance Engineer in implementing maintenance practices in an organization? Discuss in detail.
5. What are the different conditions based monitoring techniques, discuss them briefly.
6. Write importance of fault tree analysis. Discuss construction of fault tree with the help of suitable example.

SECTION-C

7. Write short notes on :
 - a) Chemical Control of corrosion.
 - b) Total productive maintenance.
 - c) Machine failure pattern.
8. Discuss the importance of reliability improvement in an organization. Also explain the concept of redundant and stand by systems.
9. List the possible causes of failure of bearing and explain how to overcome them?

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B.Tech. (CSE/ AI /EE/ ECE/ IT/ ME) (Sem.-7,8)

ARTIFICIAL INTELLIGENCE

Subject Code : BTEC-908A-18

M.Code : 90678

Date of Examination: 18-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

1. Write briefly:

- a) What is the role of intelligent agents in solving AI problems?
- b) What is McCulloch Neural Model?
- c) What is a search tree?
- d) Name some fuzzy set operations.
- e) Differentiate between fuzzy set and crisp set.
- f) What is the advantage of Genetic Algorithm over conventional algorithm?
- g) Define heuristic search.
- h) What is Mamdani Fuzzy Inference Systems?
- i) Give the list of MATLAB Toolboxes.
- j) What is a biological Neuron?

SECTION-B

2. Discuss knowledge representation in Artificial Intelligence.
3. **Write short notes on :**
 - a) Recurrent Networks
 - b) Associative Memories.
4. Consider two fuzzy subsets of the set X , $X = \{a, b, c, d, e\}$ referred to as A and B .
 $A = \{1/a, 0.3/b, 0.2/c, 0.8/d, 0/e\}$ and $B = \{0.6/a, 0.9/b, 0.1/c, 0.3/d, 0.2/e\}$
Find :
 - a) Complement
 - b) Union
 - c) Intersection
 - d) Difference
5. Discuss the various selection and crossover operators used in Genetic Algorithms. List the applications of GA.
6. Explain the process of time series forecasting using ANN.

SECTION-C

7.
 - a) Discuss different learning mechanisms used in artificial neural Networks.
 - b) Discuss the application of ANN.
8. **Write short notes on:**
 - a) Defuzzification Methods.
 - b) Hopfield Neural Networks.
9. **Explain :**
 - a) FLS for Antilock Breaking System.
 - b) String encoding of chromosomes.

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Total No. of Questions : 09

B.Tech. (CSE) (Sem-7,8)
ADHOC AND WIRELESS SENSOR NETWORKS
Subject Code : BTCS-716-18
M.Code : 90507
Date of Examination : 04-12-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

1. Write briefly :

- a) Define wireless sensor networks.
- b) What is sensor network localization?
- c) Compare sensor network with ad-hoc network.
- d) What are the disadvantages of flooding?
- e) Define black hole attack.
- f) What is data aggregation strategy in wireless sensor networks?
- g) What are contention based protocols?
- h) Define jamming.
- i) Define key management.
- j) List basic security requirements.

SECTION-B

2. Explain in detail about IEEE 802.15.4.
3. Explain the requirements of a Secure Routing Protocol for Ad-hoc Wireless Network.
4. Discuss various energy efficient routing challenges and issues in transport layer.
5. What is routing protocol? Outline the issues in designing a routing protocol for ad-hoc wireless networks.
6. List the various characteristics of ideal routing protocol for ad hoc wireless network.

SECTION-C

7. Discuss the different issues in designing a MAC protocol for ad-hoc wireless networks.
8. Discuss network security requirement issues and challenges in security provisioning networks.
9. Discuss the architecture of wireless sensor network with diagrammatic illustration.

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B.Tech. (CSE/EEE/EE/ECE/ME) (LE) (Sem-7,8)

DATABASE MANAGEMENT SYSTEM

Subject Code : BTCS501-18

M.Code : 90493

Date of Examination : 16-01-2025

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a. What is data abstraction in the context of database systems?
- b. How relational algebra is important in database systems?
- c. What is the main purpose of Data Definition Language (DDL)?
- d. Name two open-source DBMS systems.
- e. What is the purpose of indexing in a database?
- f. Define a B-tree and its main use in databases.
- g. What does the ACID acronym stand for in database management systems?
- h. Define concurrency control in the context of database systems.
- i. What is database security, and why is it important?
- j. How do web databases differ from traditional databases?

SECTION-B

2. Discuss the challenges associated with managing distributed databases, including data consistency, replication, and network latency. Explain how these challenges are addressed in distributed database systems.
3. How intrusion detection systems (IDS) contribute to database security? Discuss the types of intrusion detection methods and their effectiveness in identifying potential security threats.
4. Differentiate between logical data independence and physical data independence. Why is each important?
5. Compare and explain locking-based and timestamp-based scheduling in concurrency control. Discuss the advantages and disadvantages of each approach.
6. Explain Armstrong's Axioms in the context of functional dependency and their role in relational database design.

SECTION-C

7. Discuss the Entity-Relationship (ER) model, including its components like entities, attributes, and relationships. Explain how ER diagrams are used to represent real-world data and provide a sample ER diagram.
8. What are the various normal forms in relational database design (up to BCNF)? Illustrate. Explain the importance of normal forms in achieving data integrity and reducing redundancy.
9. Describe different types of storage strategies used in databases, including sequential, indexed, and hashed storage. Explain the benefits and drawbacks of each strategy and their ideal use cases.

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