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Question Paper Code: 59376A

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Open elective

Civil Engineering

15UEE976 - APPLIED SOFT COMPUTING

(Common to CSE, ECE, MECH, EIE ,IT and Chemical Engineering branches)

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which AI system will continue to analyze a problem until it finds the best solution? CO1- R
 - Intelligent agent
 - Neural network
 - Genetic algorithm
 - Expert system
- What is Artificial intelligence? CO1- R
 - Putting your intelligence into Computer
 - Programming with your own intelligence
 - Making a Machine intelligent
 - Putting more memory into Computer
- Artificial neural network used for CO2- R
 - Pattern recognition
 - Classification
 - Clustering
 - All of these
- In an Unsupervised learning CO2- R
 - Specific output values are given
 - Specific output values are not given
 - No specific Inputs are given
 - Both inputs and outputs are given
- Where are Genetic Algorithms applicable? CO3- R
 - Real time application
 - Biology
 - Artificial Life
 - All the above

6. All of the following are suitable problems for genetic algorithms EXCEPT CO3- R
- (a) Dynamic process control
 - (b) Pattern recognition with complex patterns
 - (c) Simulation of biological models
 - (d) Simple optimization with few variables
7. There are also other operators, more linguistic in nature, called _____ CO4- R
that can be applied to fuzzy set theory.
- (a) Hedges (b) Lingual Variable (c) Fuzz Variable (d) None of the mentioned
8. There are also other operators, more linguistic in nature, called _____ CO4- R
_____ that can be applied to fuzzy set theory.
- (a) Hedges (b) Lingual Variable (c) Fuzz Variable (d) None of the mentioned
9. Fuzzy logic controllers are based on _____ CO5- R
- (a) Heuristics (b) Linear variables (c) Non-linear variables (d) None of the above
10. Which of the following is an application of NN (Neural Network)? CO5-R
- (a) Sales forecasting (b) Data validation
 - (c) Risk management (d) All of the mentioned

PART – B (5 x 2= 10 Marks)

11. Define knowledge representation CO1- R
12. Define bias and threshold CO2-U
13. Mention the role of fitness function in genetic algorithm and what are the requirement of genetic algorithm CO3- U
14. What are the basic elements of a fuzzy logic control system? CO4- U
15. What do you mean by hybrid system? CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) With a neat block diagram explain the architecture of an Intelligence Control CO1- U (16)
- Or
- (b) Explain in detail about the rule based expert system. CO1- U (16)

17. (a) Demonstrate AND function using Hebb net with Bipolar inputs and targets CO2-Ana (16)
- Or
- (b) Demonstrate error back propagation training algorithm with the help of a flowchart. CO2-Ana (16)
18. (a) With neat flow charts, explain the concepts of Tabu search. CO3- U (16)
- Or
- (b) Describe the Ant Colony optimization technique with flow chart. CO3- U (16)
19. (a) Build the Fuzzy Logic Controller using basic components and explain with neat diagram CO4- App (16)
- Or
- (b) Let us consider the discrete fuzzy set, using Zadeh's notation, defined on universe CO4- Ana (16)
- $$X = \{a, b, c, d, e, f\},$$
- $$\tilde{A} = \left\{ \frac{1}{a} + \frac{0.9}{b} + \frac{0.6}{c} + \frac{0.3}{d} + \frac{0.01}{e} + \frac{0}{f} \right\}.$$
- Reduce this fuzzy set into several λ -cut sets, all of which are crisp.. For example, define λ -cut sets for the values of $\lambda = 1, 0.9, 0.6, 0.3, 0^+,$ and $0.$
20. (a) Explain the application of Genetic Algorithm to economic dispatch problem CO5- App (16)
- Or
- (b) Briefly explain the neural network toolbox in MATLAB. CO5- App (16)

