KUMARAGURU
college of technology
character is life

Register Number:……

M.E DEGREE EXAMINATIONS: JUNE 2018

(Regulation 2015)

Second Semester

EMBEDDED SYSTEM

P15ESTE104: Intelligent Control

COURSE OUTCOMES

CO1: Describes various soft computing required for developing intelligent systems.

CO2: Outlines the concept of ANN and genetic algorithm and its role in modelling system behavior.

CO3: Applies the knowledge of fuzzy logic techniques to analyze the system behavior with the support of development tools.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 1 = 10 Marks)

1. Assertion (A): Fuzzy terms are represented as linguistic terms. CO3 [K_2]
Reason (R): Fuzzy process does not work based on conventional mathematical Calculation.

a) Both A and R are Individually true and R is the correct explanation of A
b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

2. Neural Networks are complex _____ with many parameters. CO2 [K_1]

a) Linear functions
b) Non Linear functions
c) Discrete functions
d) Exponential functions

3. Function of dendrites is? CO1 [K_1]

a) Receptors
b) transmitter
c) Both receptor & transmitter
d) Both Reception and Transmitters.

4. Match List I with List II CO1 [K_1]

List I	List II
A. Fuzzy logic	i. Mutation
B. Defuzzification	ii. Pattern Recoginition.
C. Genetic algorithm	iii. Linguistic variables.
D. ANN	iv. Lamda cut rules

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	i	ii
c)	i	iv	iii	i
d)	iii	i	ii	Iv

5. Assertion (A): Genetic algorithm is a modern optimization technique. CO2 [K_2]
Reason (R): Genetic algorithm mimics the selection, crossover and recombination of genes.

a) Both A and R are Individually true and R is the correct explanation of A
b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

6. Fuzzy logic is a form of CO3 [K_2]

a) Two-valued logic
b) Crisp set logic
c) Many-valued logic
d) **B**inary set logic

7. Considering a graphical representation of the `tallness' of people using its appropriate member function, which of the following combinations are true? CO3 [K_2]

i. TALL is usually the fuzzy subset.
ii. HEIGHT is usually the fuzzy set.
iii. PEOPLE is usually the universe of discourse

a) i, ii & iii
b) i & ii only
c) ii, iii only
d) i, iii only

8. Genetic Algorithm are a part of CO2 [K_2]

a) Evolutionary Computing
b) Darwin's theory about evolution - "survival of the fittest"
c) An adaptive heuristic search algorithm based on the evolutionary ideas of natural selection and genetics
d) All of the above

9. Which of the following network uses supervised learning, CO1 [K_2]

1. Multilayer Perceptron
2. Self-organizing feature map
3. Hopfield Network

a) I only
b) II only
c) I and II only
d) I and III only

10. Modern optimization technique is CO3 [K_2]

a) Tabu search
b) Genetic Algorithm
c) Ant Colony
d) Neural Network

PART B (10 x 2 = 20 Marks)

11. Compare hard computing and soft computing. CO1 [K_1]
12. Define bias and Threshold. CO1 [K_1]
13. Write any four applications of Neural Network. CO1 [K_2]
14. What is hebb's rule of learning? CO2 [K_2]
15. What are the advantages of Fuzzy Logic approach to solve a problem? CO2 [K_1]
16. Explain the Fuzzy Expert system with neat diagram? CO2 [K_2]
17. Define the two basic processes of genetic algorithms. CO2 [K_1]
18. How to do crossover process in genetic algorithm? CO3 [K_2]
19. How to choose the best optimization algorithm? CO3 [K_2]
20. What are the functions of the following instructions in MATLAB? CO3 [K_1]
bin2int, Mutate, compdiv.

PART C (10 x 5 = 50 Marks)

21. Write Short notes on various approaches to intelligent control. CO1 [K_1]
22. Discuss about the drawbacks of traditional optimization methods? CO1 [K_2]
23. Explain the Hopfield Neural network with architecture. CO2 [K_2]
24. Briefly explain the architecture and training algorithm of Multilayer feed forward network. CO2 [K_2]
25. Briefly explain the various methods employed in membership value assignment. CO2 [K_1]
26. What are the different methods of defuzzification? Explain any one method. CO2 [K_2]
27. What is meant by mutation in genetic algorithm? CO2 [K_1]
28. Explain with example uniform crossover in genetic algorithm. CO3 [K_2]

29.	Explain the function of fuzzy inference system.	CO3	[K_1]
30.	Explain about sugeno fuzzy models with neat diagram.	CO3	[K_2]

Answer any TWO Questions
PART D (2 x 10 = 20 Marks)

31.	With neat sketch explain the architecture of back propagation network with algorithm for training a neural network.	CO1	[K_3]
32.	Explain genetic algorithm in detail with example.	CO2	[K_1]
33.	Explain how fuzzy logic controller is implemented in MATLAB toolbox.	CO3	[K_3]

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