ii.	Write about the general procedure to be followed in building ANNs.	4	2	1	1
	(OR)				
b.	Consider a sample classification problem and explain about setting the decision boundaries in Two-dimensions, with the AND, OR, XOR operations.	10	2	1	1
27. a.	Explain about how the back propagation algorithm performs the adjustment of the interconnection weights during the learning process.	10	2	2	1
	(OR)				
b.	Elaborate about the radial basis function neural network, its application, its input vector, output nodes and training the RBFN network.	10	2	2	1
28. a.	With a sample scenario, explain about the useful transformations that can be applied to fuzzy membership functions.	10	3	3	1
	(OR)				
b.	Discuss in detail about the composition operation on crisp set relations.	10	2	3	1
29. a.i.	Explain about the fuzzy controller with a block diagram.	5	2	4	1
ii.	Write about designing the fuzzy air-conditioner controller, with the fuzzy rule base and fuzzy membership function.	5	2	4	1
	(OR)				
b.	Consider about designing a fuzzy cruise controller system. Explain about the fuzzy membership profiles, rule base and rule implication.	10	2	4	2
30. a.	Write notes on the following		2	5	1
(i)	Natural evolution	2			
(ii)	Mutation	3			
(iii)	Cross over	3			
(iv)	Selection	2			
	(OR)				
b.	Explain in detail about the general procedure of genetic algorithm with appropriate flow diagram and block diagram.	10	2	5	1

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Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2022

Sixth Semester

18CSE352T – NEURO FUZZY AND GENETIC PROGRAMMING

(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours

Max. Marks: 75

	Marks	BL	CO	PO
PART – A (25 × 1 = 25 Marks)				
Answer **ALL** Questions				
1. In ADALINE, what happens if the learning rate is set too large?	1	1	1	1
(A) The learning process is extremely slow (B) It may prevent the learning process to converge				
(C) The learning process is very fast (D) The learning process is average				
2. Which rule does not guarantee to learn all linearly separable problems?	1	1	1	1
(A) Delta rule (B) Perception rule				
(C) LMS rule (D) Hebb's rule				
3. The output of a processing node is called its _____.	1	1	1	1
(A) Activation (B) Activation function				
(C) Weights (D) Input vector				
4. For classifying 3-dimensional patterns of the form (x_1, x_2, x_3), the equation formed by a perceptron would be	1	1	1	1
(A) Equation of a straight line (B) Equation of a plane surface				
(C) Equation of a hyperplane (D) Equation of a curve				
5. What function is this? $g(x)=\frac{1}{1+e^{-\sigma x}}$	1	1	1	1
(A) Binary step function (B) Binary threshold function				
(C) Binary sigmoid function (D) Bipolar sigmoid function				
6. Which of the following is a desirable property of the activation function employed in a back propagation net?	1	1	2	1
(A) Discontinuous (B) Differentiable				
(C) Decreasing (D) Discrete				
7. Which of the following is a metric for similarity?	1	1	2	1
(A) Weighted sums (B) Activation values				
(C) Euclidean distance (D) Bias term				

8. Which of the following net always has the same number of input and output units? 1 1 2 1
   (A) Feed-forward neural net (B) Feedback neural net
   (C) Auto associative net (D) Hetro associative net

9. Hopfield network is used for 1 1 2 1
   (A) Pattern Classification (B) Pattern Clustering
   (C) Pattern Association (D) Pattern Prediction

10. Which of the following is an example for un-supervised learning? 1 1 2 1
   (A) Bidirectional associative memory (B) Hetero associative net
   (C) Self-organizing map (D) Learning vector quantization

11. Which of the following is not a possible conclusion if you apply simplification rule for the premise "I have a son and I have a daughter" 1 1 3 1
   (A) I have two children (B) I have a son and a daughter
   (C) I have a daughter (D) My daughter is younger than my child

12. Which neural network was introduced to resolve the stability-plasticity dilemma? 1 1 3 1
   (A) MAXNET (B) Kohonen's SOM
   (C) Learning vector quantization (D) Adaptive Resonance Theory

13. Which reason of ART net is designed for patterns with real or continuous values? 1 1 3 1
   (A) Simple ART (B) ART 1
   (C) ART 2 (D) Binary ART

14. In ART 1, the weights associated with bottom-up interconnections are _____. 1 1 3 1
   (A) Binary (B) Real-valued
   (C) Integers (D) Discrete

15. What is the use of vigilance parameter in ART1? 1 1 3 1
   (A) To control learning rate (B) To control the degree of similarity among patterns
   (C) The control the number of clusters (D) To control error rate

16. Which of the following is the second step in fuzzy inference system? 1 1 4 1
   (A) Fuzzification of the input variables (B) Evaluation of the fuzzy rules
   (C) Application of fuzzy operators on the antecedent parts of the rules (D) Defuzzification of the resultant fuzzy set

17. Let us consider the basic tipping problem which takes service and food quality as inputs and computes a tip percentage. Which of the following linguistic value is not a valid one to represent the fuzzy set service? 1 1 4 1
   (A) Poor (B) Rancid
   (C) Good (D) Excellent

18. Which of the following is the consequent part of the rule "If the car is far away AND it is running slowly then cross the road leisurely"? 1 1 4 1
   (A) Cross the road leisurely (B) Car is far away
   (C) It is running slowly (D) The car is far away AND it is running slowly

19. Fuzzy rules are evaluated by employing some implication process. What will be the output of the evaluation of fuzzy rules? 1 1 4 1
   (A) The number provided by applying fuzzy operators on the antecedent parts (B) A crisp value which represents some linguistic value
   (C) Reshaped fuzzy set corresponding to the consequent part of the rule (D) Fuzzy sets corresponding to the antecedent part

20. An input to the fuzzy inference system is 1 1 4 1
   (A) A crisp value (B) A fuzzy value
   (C) A fuzzy set (D) A linguistic variable

21. The ratio of the individual chromosome's fitness to the population's total fitness determines 1 1 5 1
   (A) The chromosome to be discarded (B) The chromosome's chance of being selected for mating
   (C) Rejection probability (D) Rejection chance

22. Mutation represents 1 1 5 1
   (A) A copy in the gene (B) Selecting a gene
   (C) Rejecting a gene (D) Change in the gene

23. In genetic algorithm, the objective function used to evaluate a particular solution is 1 1 5 1
   (A) Polynomial function (B) Linear function
   (C) Fitness function (D) Quadratic function

24. When two dissimilar chromosomes crossover, if the crossover takes place within the defining length, the schema 1 1 5 1
   (A) Cannot be destroyed (B) Can be destroyed
   (C) Will survive (D) Is defined well

25. Probability of survival under mutation is 1 1 5 1
   (A) Lower for low-order schemata (B) Higher for high-order schemata
   (C) Equal for high-order and low-order-schemata (D) Higher for low-order schemata

PART – B (5 × 10 = 50 Marks) Marks BL CO PO
Answer **ALL** Questions

26. a.i. Explain in detail about the network of McCulloch-Pitts neurons with a diagram. 6 2 1 1