*Total No. of Questions: 4*

 **Enrollment No.......................................**

Faculty of Engineering

Model Test Paper - 2022

CS3EA03 Soft Computing

Programme: B.Tech Branch/Specialisation: CS

**Duration: 3 Hrs. Maximum Marks: 60**

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| Q.1 |  | Any soft-computing methodology is characterized with  (a) Precise solutions.  (b) Control actions are unambiguous and accurate.  (c) Control action is formally defined.  (d) Algorithm which can easily adapt with the change of dynamic environment. | **1** |
|  |  | Who initiated the idea of Soft Computing?  (a) Charles Darwin (b) Lofti A Zadeh  (c) Rechenberg (d) McCulloch | **1** |
|  |  | Which of the following is true?  (i) On average, neural networks have higher computational rates than conventional computers.  (ii) Neural networks learn by example.  (iii) Neural networks mimic the way the human brain works.    (a) All of the mentioned are true  (b) (ii) and (iii) are true  (c) (i), (ii) and (iii) are true  (d) None of the mentioned | **1** |
|  |  | Artificial neural network used for\_\_\_\_\_\_\_\_\_\_\_  (a) Pattern Recognition (b) Classification  (c) Clustering (d) All of these | **1** |
|  |  | If A and B are two fuzzy sets with membership functions  μA(x) = {0.2, 0.5, 0.6, 0.1, 0.9} μB(x) = {0.1, 0.5, 0.2, 0.7, 0.8} Then the value of μA∩B will be  a) {0.2, 0.5, 0.6, 0.7, 0.9} b) {0.2, 0.5, 0.2, 0.1, 0.8}  c) {0.1, 0.5, 0.2, 0.1, 0.8} d) {0.1, 0.5, 0.6, 0.1, 0.8} | **1** |
|  |  | Fuzzy logic is usually represented as \_\_\_\_\_\_\_\_\_\_\_  a) IF-THEN-ELSE rules  b) IF-THEN rules  c) Both IF-THEN-ELSE rules & IF-THEN rules  d) None of the mentioned | **1** |
|  |  | What is Genetic Algorithm?  a) Reflects the process of natural selection where the fittest individuals are selected for reproduction.  b) Reflects the process of natural fitting where the fittest individuals are selected for reproduction  c) Reflects the process of natural crossover where the fittest individuals are selected for reproduction  d) None of these | **1** |
|  |  | Hybrid computing is combination hard and soft computing  a) True b) False | **1** |
|  |  | Neuro fuzzy system is which type of system  (a) fuzzy system (b) Nodes or neurons  (c) hybrid system (d) none of them | **1** |
|  |  | Core of soft computing is  (a) Fuzzy networks and artificial intelligence  (b) Fuzzy computing, neural computing, genetic algorithms  (c) Artificial intelligence and neural science  (d) Neural science and genetic science | **1** |
|  |  |  |  |
| Q.2 |  | Distinguish between soft computing and hard computing. | **3** |
|  |  | Explain the Perceptron learning algorithm | **7** |
| OR |  | Draw and Explain the basic model of Adaline network. | **7** |
|  |  |  |  |
| Q.3 |  | Explain types of learning in neural network. | **4** |
|  |  | Explain the EBPA algorithm. | **6** |
| OR |  | Draw and Explain the basic model of BAM. | **6** |
|  |  |  |  |
| Q.4 |  | Discuss any two applications of fuzzy logic | **4** |
|  |  | Let X= {x1, x2}, Y= {y1, y2}, and Z= {z1, z2, z3}. The relation R and S are given below:  R(X, Y)= and S(Y, Z)=  Determine RοS using max-min composition and max-product composition. | **6** |
| OR |  | Explain any three defuzzification methods with suitable example. | **6** |
|  |  |  |  |
| Q.5 | i. | Discuss any two applications of genetic algorithm. | **3** |
|  | ii. | What is optimization ? draw and explain structure of GA. | **7** |
| OR | iii | Explain crossover operators used in process of genetic algorithm. | **7** |
|  |  |  |  |
| Q.6 | i. | What do you mean by hybrid systems? | **2** |
|  | ii. | Explain architecture of fuzzy backpropagation network. | **8** |
| OR | iii. | Explain genetic algorithm-based backpropagation network. | **8** |