


**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

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QUESTION BANK (DESCRIPTIVE)Subject with Code: **Soft Computing(20CS0531)**Course & Branch: **B.Tech – CSE,CSM**Regulation: **R20**Year &Sem: **III-B.Tech & I - Sem****UNIT –I****INTRODUCTION TO SOFT COMPUTING**

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|----|---|--|-----------|-------|
| 1 | a | Illustrate the basic components of Artificial Intelligence and its applications. | [L3][CO1] | [8M] |
| | b | Compare soft computing and hard computing | [L5][CO1] | [4M] |
| 2 | a | Explain the working principle of Artificial Neuron. | [L2][CO1] | [8M] |
| | b | Differentiate Biological Neuron and Artificial Neuron. | [L4][CO1] | [4M] |
| 3 | | Summarize the following terms:
i)Fuzzy Systems ii) Genetic Algorithm | [L5][CO1] | [12M] |
| 4 | a | Distinguish between Supervised Learning and Unsupervised Learning. | [L4][CO1] | [6M] |
| | b | Describe the different activation functions in Neural Networks. | [L2][CO1] | [6M] |
| 5 | | Infer the classifications of Artificial Neural Networks. | [L2][CO1] | [6M] |
| 6 | a | Analyze Swarm Intelligent Systems. | [L4][CO1] | [6M] |
| | b | Describe the role of Evolutionary Programming in Soft Computing. | [L2][CO1] | [6M] |
| 7. | a | Explain McCulloch and Pitts Neuron Model. | [L2][CO1] | [6M] |
| | b | Demonstrate how AND function is implemented in M-P Neuron Model. | [L3][CO1] | [6M] |
| 8 | | Describe Hebb network in Artificial Neural Networks. | [L2][CO1] | [12M] |
| 9 | | Illustrate the Perceptron Network with neat diagram. | [L3][CO1] | [12M] |
| 10 | | Explain briefly Adaline and Madaline Networks. | [L2][CO1] | [12M] |

UNIT –II

ARTIFICIAL NEURAL NETWORKS

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|----|--|------------------------|--------------|
| 1 | Analyze the Back propagation of Neural Network with neat diagram. | [L4][CO2] | [12M] |
| 2 | Discuss Self –Organizing Map algorithm and its features. | [L2][CO2] | [12M] |
| 3 | Illustrate Learning Vector Quantization with neat sketch. | [L3][CO2] | [12M] |
| 4 | Explain Hamming neural network with neat diagram. | [L2][CO2] | [12M] |
| 5 | Describe architectural functions and its characteristics of Hopfield Neural Network with neat sketch. | [L2][CO2] | [12M] |
| 6 | a Discuss Bidirectional Associate Memory and its applications.
b Analyze the Characteristics , limitations and applications of Associative memory | [L2][CO2]
[L4][CO2] | [8M]
[4M] |
| 7 | a Generalize the Adaptive Resonance Theory Neural Network
b Identify some applications of ART Model | [L6][CO2]
[L2][CO2] | [8M]
[4M] |
| 8 | Illustrate the Support Vector Machine with neat diagram.
Summarize the following terms | [L3][CO2] | [12M] |
| 9 | i) Hebbian learning rule
ii) Perceptron , Delta learning Rules | [L2][CO2] | [12M] |
| 10 | Describe the structure of back propagation neural network and derive the learning rule for the back propagation algorithm. | [L2][CO2] | [12M] |

UNIT –III

FUZZY SYSTEMS

1	Explain the various types of operations on Fuzzy Sets with examples.	[L2][CO3]	[12M]
2	Explain with neat block diagram the various components of a Fuzzy Logic System.	[L2][CO3]	[8M]
	b Differentiate the fuzzy sets and classical sets.	[L4][CO3]	[4M]
3	a Discuss the various operations on Classical Sets with simple examples.	[L2][CO3]	[6M]
	b List out the various operations on Classical relations.	[L1][CO3]	[6M]
4	a Describe the various fuzzy relations with suitable examples.	[L2][CO3]	[8M]
	b Differentiate classical relations and Fuzzy relations	[L4][CO3]	[4M]
5	Explain the Frame work of Fuzzy Inference Systems with neat sketch.	[L2][CO3]	[12M]
6	a Demonstrate the membership functions in fuzzy logic.	[L3][CO4]	[6M]
	b Define Fuzzification and explain membership value assignment in fuzzy logic.	[L2][CO4]	[6M]
7	Analyze the different types of defuzzification methods with relevant mathematical expression and diagram.	[L4][CO4]	[12M]
8	Summarize the following terms: i) Fuzzy Arithmetic ii) Fuzzy Measures	[L5][CO4]	[12M]
9	Explain about Fuzzy rule base and approximate reasoning in Fuzzy logic.	[L2][CO4]	[12M]
10	a Compare Mamdani FIS and Sugeno FIS	[L5][CO4]	[8M]
	b Demonstrate the Fuzzy Decision Making briefly.	[L3][CO4]	[4M]

UNIT –IV
GENETIC ALGORITHMS

1	Explain the basic terminologies in Genetic Algorithm and illustrate the working of GA?	[L3][CO5]	[12M]
2	Discuss about Simple genetic algorithm with neat sketch.	[L2][CO5]	[12M]
3	Explain the Various Operators in genetic algorithm?	[L2][CO5]	[12M]
	Summarize the following terms:		
4	i) Mutation operation	[L5][CO5]	[12M]
	ii) Selection operation.		
5	a Analyze Inversion and Deletion Operators in GA.	[L4][CO5]	[6M]
	b Describe the applications of genetic algorithm.	[L1][CO5]	[6M]
6	a How Fitness Function can be evaluated in Genetic Algorithm?	[L1][CO5]	[4M]
	b Describe various Encoding Techniques of Genetic algorithm.	[L2][CO5]	[8M]
7	Illustrate the different bitwise operators in GA.	[L3][CO5]	[12M]
8	Analyze the various cross over operations performed in GA.	[L2][CO5]	[12M]
9	a List out the different reproduction and inheritance operators used in GA.	[L2][CO5]	[6M]
	b Identify the Advantages and Disadvantages of Genetic Algorithm.	[L2][CO5]	[6M]
10	Briefly explain Convergence of Genetic Algorithm.	[L2][CO5]	[12M]

UNIT –V**HYBRID SYSTEMS**

1	Demonstrate the different types of hybrid systems.	[L3][CO6]	[12M]
2	Explain the LR type fuzzy Numbers.	[L2][CO6]	[12M]
3	Discuss in detail about Fuzzy – Genetic Hybrid System.	[L4][CO6]	[12M]
4	Design a Fuzzy Logic Controller using Genetic Algorithm.	[L6][CO6]	[12M]
5	Illustrate the operational features and working principle of fuzzy ARTMAP.	[L3][CO6]	[12M]
6	With a neat Architecture, explain Fuzzy Back propagation network.	[L2][CO6]	[12M]
7	Infer the Fuzzy Logic Controller with neat Architecture.	[L4][CO6]	[12M]
8	a Explain Genetic Algorithm based Back propagation network	[L1][CO6]	[5M]
	b Illustrate Neuro – Fuzzy hybrid system with neat diagram.	[L3][CO6]	[7M]
9	Summarize the following i)Fuzzy Neuron	[L4][CO6]	[4M]
	ii)Neuro – Genetic System.	[L4][CO6]	[8M]
10	a Explain various Soft Computing Tools.	[L2][CO6]	[6M]
	b Compare Neural Processing and Fuzzy Processing	[L5][CO6]	[6M]