


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

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**QUESTION BANK (DESCRIPTIVE)**Subject with Code: **Soft Computing(19CS0544)**Course & Branch: **B.Tech - CSE**Regulation: **R19**Year & Sem: **IV-B.Tech & I - Sem****UNIT –I****INTRODUCTION TO SOFT COMPUTING**

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 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]
	a	Distinguish between Supervised Learning and Unsupervised Learning	[L4][CO1]	[6M]
4.	b	Describe the different activation functions in Neural Networks	[L2][CO1]	[6M]
		Infer the classification 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 Hebbian in Artificial Neural Networks briefly.	[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**

1		Explain the Back propagation of Neural Network with neat diagram and flowchart.	[L2][CO2]	[12M]
2		Discuss Self –Organizing Map algorithm and features of Kohonen’s Map	[L2][CO2]	[12M]
3		Illustrate Learning Vector Quantization with neat sketch.		[12M]
4	<b>a</b>	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	<b>a</b>	Discuss Bidirectional Associate Memory and its applications.	[L2][CO2]	[6M]
	<b>b</b>	Analyze the Characteristics , limitations and applications of Associative memory	[L4][CO2]	[6M]
7	<b>a</b>	Generalize the Adaptive Resonance Theory Neural Network	[L6][CO2]	[8M]
	<b>b</b>	Identify some applications of ART Model	[L2][CO2]	[4M]
8		Illustrate the Support Vector Machine with neat diagram.	[L3][CO2]	[12M]
9		Explain the characteristics and applications of Spike Neuron Models with neat sketch.	[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	<b>a</b>	Explain with neat block diagram the various components of a Fuzzy Logic System	[L2][CO3]	[8M]
	<b>b</b>	Differentiate the fuzzy sets and classical sets	[L4][CO3]	[4M]
3	<b>a</b>	Discuss the various operations on Classical Sets with simple examples	[L2][CO3]	[6M]
	<b>b</b>	List out the various relations on Classical Sets	[L1][CO3]	[6M]
4	<b>a</b>	Describe the various fuzzy relations with suitable examples.	[L2][CO3]	[8M]
	<b>b</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	<b>a</b>	Demonstrate the membership functions in fuzzy logic.	[L3][CO3]	[6M]
	<b>b</b>	Define Fuzzification and explain membership value assignment in fuzzy logic.	[L2][CO3]	[6M]
7		Analyze the different types of defuzzification methods with relevant mathematical expression and diagram.	[L4][CO3]	[6M]
8		Summarize the following terms: i) Fuzzy Arithmetic ii) Fuzzy Measures	[L5][CO3]	[12M]
9		Explain about Fuzzy rule base and approximate reasoning in Fuzzy logic.	[L2][CO3]	[12M]
10	<b>a</b>	Compare Mamdani FIS and Sugeno FIS	[L5][CO3]	[8M]
	<b>b</b>	Demonstrate the Fuzzy Decision Making briefly.	[L3][CO3]	[4M]

**UNIT –IV**  
**GENETIC ALGORITHMS**

1		Explain the basic terminologies in Genetic Algorithm and illustrate the working of GA?	[L3][CO4]	[12M]
2		Discuss about Simple genetic algorithm with neat sketch.	[L2][CO4]	[12M]
3		Explain the Various Operators in genetic algorithm?		[12M]
4		Summarize the following terms: a) Mutation operation b) Selection operation.	[L5][CO4]	[12M]
5	<b>a</b>	Analyze Inversion and Deletion Operators in GA.	[L4][CO4]	[6M]
	<b>b</b>	Describe the applications of genetic algorithm.	[L1][CO4]	[6M]
6		Evaluate the operational procedure of Genetic Algorithm.	[L2][CO4]	[12M]
7		List out various Selection Methods in Genetic Algorithm. Explain Roulette Wheel Selection Method in GA.	[L2][CO4]	[12M]
8	<b>a</b>	Explain the various cross over operations performed in GA	[L2][CO4]	[6M]
	<b>b</b>	Illustrate the different bitwise operators in GA.	[L3][CO4]	[6M]
9	<b>a</b>	Describe the different reproduction and inheritance operators used in GA.	[L2][CO4]	[6M]
	<b>b</b>	Identify the Advantages and Disadvantages of Genetic Algorithm.	[L2][CO4]	[6M]
10		Briefly explain Convergence of Genetic Algorithm.	[L2][CO4]	[6M]

**UNIT –V**  
**HYBRID SYSTEMS**

1		Demonstrate the architecture of ANFIS network and Explain.	[L3][CO6]	[12M]
2		Draw and explain the LR type fuzzy Architecture.	[L2][CO5]	[12M]
3		Discuss in detail about Genetic learning of Rule Base and Knowledge Base	[L4][CO5]	[12M]
4		Design a Fuzzy Logic Controller using Genetic Algorithm	[L6][CO5]	[12M]
5		Explain the operational features and working principle of fuzzy ARTMAP	[L2][CO6]	[12M]
6		With a neat Architecture, explain Fuzzy Back propagation network.	[L2][CO5]	[12M]
7	<b>a</b>	Infer the characteristics of Neuro-fuzzy Hybrid System.	[L4][CO5]	[6M]
	<b>b</b>	Describe the working principle of Neuro-fuzzy system learn?	[L2][CO5]	[6M]
8		How are genetic algorithm utilized for optimizing the weights in neural network architecture.	[L1][CO6]	[12M]
9		Categorize the various types of Neuro-fuzzy System	[L4][CO5]	[12M]
10	<b>a</b>	Define Hybrid System and Explain the Classification of hybrid systems	[L2][CO5]	[6M]
	<b>b</b>	Compare Neural Processing and Fuzzy Processing	[L5][CO5]	[6M]

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