Course Code: 20CS0531 **R20**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code: **Soft Computing(20CS0531)** Course & Branch: **B.Tech – CSE,CSM,CIC**

Regulation: **R20** Year &Sem: **III-B.Tech & I - Sem**

UNIT –I

INTRODUCTION TO SOFT COMPUTING

1	**a**	Illustrate the basic components of Artificial Intelligence and itsapplications.	[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]	**[12M]**
6	**a**	Analyze Learning Techniques in ANN	[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 ANDNOT function is implemented in M-P Neuron Model.	[L3][CO1]	**[6M]**
8	**a**	List out the different Learning rules and terminology in ANN.	[L2][CO1]	**[4M]**
	b	Describe Hebb Network in Artificial Neural Network.	[L2][CO1]	**[8M]**
9		Illustrate the Perceptron Network with neat diagram.	[L3][CO1	**[12M]**
10		Explain briefly Adaline and Madaline Networks.	[L2][CO1]	**[12M]**

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UNIT –II
ARTIFICIAL NEURAL NETWORKS

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		Analyze Fixed weight networks advanced neural network.	[L4][CO2]	**[12M]**
4	**a**	Explain Hamming neural network with neat diagram.	[L2][CO2]	**[8M]**
	b	Explain Max network with architecture.	[L2][CO2]	**[4M]**
5		Describe architectural functions and its characteristics of Hopfield Neural Network with neat sketch.	[L2][CO2]	**[12M]**
6	**a**	Discuss Bidirectional Associative Memory with neat architecture	[L2][CO2]	**[7M]**
	b	Analyze Auto Associative memory and Hetero Associative memory.	[L4][CO2]	**[5M]**
7	**a**	Generalize the Adaptive Resonance Theory Neural Network	[L6][CO2]	**[8M]**
	b	Identify some applications of ART Model	[L2][CO2]	**[4M]**
8	**a**	Illustrate the Support Vector Machine .	[L3][CO2]	**[8M]**
	b	List out the Applications of SVM.	[L1][CO2]	**[4M]**
9		Explain the types of Hopfield Network with neat architectures.	[L2][CO2]	**[12M]**
10		Summarize the following i)Feed forward phase in BPNN ii) Back propagation Error iii) Updation of weight and bias in BPNN.	[L2][CO2]	**[12M]**

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UNIT –III
FUZZY SYSTEMS

1		Explain the various types of operations and **properties**(now added) on Fuzzy Sets with examples.	[L2][CO3]	**[12M]**
2	**a**	Explain the various components of a FuzzyLogic System with neat block diagram.	[L2][CO3]	**[8M]**
	b	Differentiate the fuzzy sets and classical sets.	[L4][CO3]	**[4M]**
3	**a**	Discuss the various operations and properties on Classical Sets with simple examples.	[L2][CO3]	**[6M]**
	b	List out the various operations and composition operations on Classical relations explain it.	[L1][CO3]	**[6M]**
4	**a**	Describe the various fuzzy composition 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 with suitable examples: i)Fuzzy Arithmetic ii) Fuzzy Measures	[L5][CO4]	**[12M]**
9		Explain the Fuzzy rule base and approximate reasoning in Fuzzy logic.	[L2][CO4]	**[12M]**
10	**a**	Compare Mamdani FIS and Sugeno FIS	[L5][CO4]	**[6M]**
	b	Demonstrate the Fuzzy Decision Making briefly.	[L3][CO4]	**[6M]**

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UNIT –IV
GNETIC ALGORITHMS

1		Define the Genetic algorithm with basic terminologies and illustrate theworking principle of Genetic Algorithm?	[L3][CO4]	**[12M]**
2		Discuss about Simple genetic algorithm with neat sketch.	[L2][CO4]	**[12M]**
3	**a**	List out the various operators in Genetic Algorithm.	[L1][CO4]	**[4M]**
	b	Explain the Various Operators in Genetic Algorithm?	[L2][CO4]	**[8M]**
4		Summarize the following terms: i) Mutation operation ii) Selection operation.	[L5][CO4]	**[12M]**
5	**a**	Analyze Inversion and Deletion Operators in GA.	[L4][CO4]	**[6M]**
	b	Describe the applications of genetic algorithm.	[L1][CO4]	**[6M]**
6	**a**	How Fitness Function can be evaluated in Genetic Algorithm?	[L1][CO4]	**[4M]**
	b	Describe various Encoding Techniques of Genetic algorithm.	[L2][CO4]	**[8M]**
7	**a**	List out the various Bitwise Operators are in GA.	[L3][CO4]	**[4M]**
	b	Illustrate the bitwise operators in GA with suitable examples.	[L3][CO4]	**[8M]**
8		Analyze the various cross over operations performed in GA.	[L2][CO4]	**[12M]**
9	**a**	List out the different reproduction and inheritance operators in GA.	[L2][CO4]	**[6M]**
	b	Identify the Advantages and Disadvantages of Genetic Algorithm.	[L2][CO4]	**[6M]**
10	**a**	Draw the flow chart for the working principle of Genetic Algorithm. Explain it.	[L2][CO4]	**[6M]**
	b	Briefly explain Convergence of Genetic Algorithm.	[L2][CO4]	**[6M]**

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UNIT –V

HYBRID SYSTEMS

1	**a**	List out the various types of hybrid systems.	[L1][CO5]	**[4M]**
	b	Explain the basic categories of Hybrid system with neat architectures.	[L3][CO5]	**[8M]**
2	**a**	List out the applications of hybrid system.	[L4][CO5]	**[4M]**
	b	Analyze the Auxiliary hybrid system with neat architecture.	[L2][CO5]	**[8M]**
3	**a**	Discuss in detail about Fuzzy – Genetic Hybrid System.	[L4][CO5]	**[8M]**
	b	Identify the advantages and disadvantages of Fuzzy-Genetic hybrid systems.	[L1][CO5]	**[4M]**
4	**a**	Illustrate Neuro-Genetic hybrid systems with neat diagram.	[L3][CO5]	**[8M]**
	b	Explain the advantages and disadvantages of Neuro-genetic hybrid Systems	[L2][CO5]	**[4M]**
5	**a**	Explain Neuro – Fuzzy hybrid system with neat diagram.	[L2][CO5]	**[8M]**
	b	Illustrate the advantages and disadvantages of Neuro-Fuzzy hybrid systems.	[L3][CO5]	**[4M]**
6	**a**	Draw the Architecture of Fuzzy Back propagation. Explain it.	[L2][CO5]	**[6M]**
	b	Describe LR Type Fuzzy numbers	[L2][CO5]	**[6M]**
7	**a**	Explain about Fuzzy Neuron.	[L2][CO5]	**[6M]**
	b	Infer the Fuzzy Logic Controller with neat Architecture.	[L4][CO5]	**[6M]**
8	**a**	Design a Fuzzy Logic Controller using Genetic Algorithm.	[L6][CO5]	**[6M]**
	b	Describe the Fuzzy Rule Base with neat architecture.	[L2][CO5]	**[6M]**
9	**a**	Explain various Soft Computing Tools.	[L2][CO5]	**[6M]**
	b	Compare sequential , auxillary and embedded hybrid systems.	[L5][CO5]	**[6M]**
10	**a**	Explain the various components in Fuzzy Rule Base System.	[L2][CO5]	**[6M]**
	b	Compare Neuro processing and Fuzzy Processing.	[L4][CO5]	**[6M]**