SOFT COMPUTING

UNIT – I

1. The structural constitute of a human brain is known as ------------------

1. **Neuron** b)Cells c)Chromosomes d)Genes

2.Neural networks also known as -----------------------

a)Artificial Neural Network b)Artificial Neural Systems

**c)Both A and B** d) None of the above

3. Neurons also known as -----------------

a)Neurodes b)Processing elements c)Nodes **d)All the above**

4. In the neuron, attached to the soma are long irregularly shaped filaments called--------------

**a)Dendrites** b)Axon c)Synapse d)Cerebellum

5. Signum function is defined as -------------------

**a) φ(I) =+1, I>0, -1, I<=0**

b) φ(I)=0

c) φ(I)=+1,I>0

d) φ(I)=-1,I<=0

6. To generate the final output, the sum is passed on to a non-linear filter φ called

a)Smash function b)sum function **c)Activation function** d)Output function

7. ---------------function is a continuous function that varies gradually between the asymptotic values 0 and 1 or -1 and +1

a)Activation function b)Thresholding function c)Signum function **d)Sigmoidal function**

**8**.-----------------produce negative output values

**a)Hyperbolic tangent function** b)Parabolic tangent function

c)Tangent function d)None of the above

9.-------------------- carrying the weights connect every input neuron to the output neuron but not vice-versa.

**a)Feed forward network**

b)Fast forward network

c)Fast network

d)Forward network

10.------------- has not feedback loop

a)Neural network **b)Recurrent Network** c)Multilayer Network d)Feed forward network

11. In the learning method, the target output is not presented to the network ----------------

a) Supervised learning **b)Unsupervised learning**

c)Reinforced learning d)Hebbian learning

12. Combining a number of ADALINE is ----------------

a) MULTILINE b)MULTIPLE LINE **C)MADALINE** d)MANYLINE

13.Neural network applications -----------------

a) Pattern Recognition b)Optimization Problem c)Forecasting **d)All the above**

14.------------------ is a Systematic method for training multilayer artificial neural network

**a)Back propagation** b)Forward propagation c)Speed propagation d)Multilayer propagation

15. --------------------- is a computational model

a) neuron b) cell **c)Perception** d)Neucleus

16.Intermediatry layer is present in ----------------------

**a)Multilayer feedforward perception model**

b)Multilayer perception model

c)Multilayer Feedforward model

d)None of the above

17.Linear Activation Operator equation is ---------------

**a) O=gI,g=tanφ**

b) O=gI,g=sinφ

c) O=gI,g=cosφ

d) O=gI,g=-tanφ

18.--------------- is never assured of finding global minimum as in the simple layer delta rulecase.

**a)Back propagation** b)Front Propagation c)Propagation d)None above

19.The test of neural network is known as--------------

**a)Inference Engine** b)Checking c)Deriving d)None

20.Application of Back Propagation

a)Design of Journal Bearing b)Classification of soil

c)Hot Extrusion of soil **d)All the above**

21. Reinforced learning also known as ----------------

**a)Output based learning** b)Error based learning

c)Back propagation learning d)None

22.---------------------learning follows “Winner takes all” strategy

a)Stochastic learning **b)Competitive learning** c)Hebbian learning d)BackPropagation learning

23.------------------earlier neural network architecture,

**a)Rosenblatt Perception** b)Rosen Perception c)Roshon Perception d)None

24. In Rosenblatt’s Perception network has three units, sensory unit, association unit and --------------a)Output unit **b) Response unit** c) feedback unit d) Result unit

25.ADALINE stands for --------------------------

**a)Adaptive Linear Neural Element Network**

b)Adaptive Line Neural Network

c)Adapt Line Neural Element Network

d)Adaptive Linear Neural Network

PART-B

1. Explain model of artificial neuron
2. Differentiate Learning methods supervised, unsupervised, and reinforced learning
3. Explain Rosenblatt’s Perception
4. Explain ADALINE network
5. Explain Single layer ANN
6. Explain any one application of Back propagation networks

PART-C

1. Explain neural network architecture
2. Explain back propagation learning briefly
3. Explain basic concepts of neural network

UNIT-2

1.----------------is a store house of associated patterns which are encoded in some form

**a)Associative memory** b) Commutative memory

c)Neural networks d)Memory

2. If the associated pattern pairs (x,y) are different and if the model recalls a y given an x or vice versa, then it is termed as -------------

a) Auto associative memory **b) Hetero associative memory**

c) neuro associative memory d) none

3. Autoassociative correlation memories are known as ---------------

**a) Auto correlators** b) Hetero Correlators c)Neuro Correlators d) None

4.--------------- recalls an output given an input in one feedforward pass

**a)Static networks** b) Dynamic networks c)Recurrent networks d) None

5.BAM stands for ----------------

**a)Bidirectional Associative Memory** b)v Associative Memory

c)Biconventional Associative Memory d) None

6.----------------- associates patterns in bipolar forms that are real-coded

**a)Simplified Bidirectional Associative Memory** b)Bipolar form

c)Bidirectional form d)None

7)---------------------- uses bipolar coding

a)Fabric defect identification **b)Recognition of Characters**

c)Design of Journal Bearing d) Classification of soil

8)Self-organizing network also known as ---------------------

a)Back Propagation network **b)Training free counter propagation network**

c)Propagation network d)none

9)Kesko proposed an energy function for the two states -----------------

a)E(A,B)=AMBT

**b)E(A,B)=-AMBT**

C)E(A,B)=-ABT

D)E(A,B)=ABT

10) BAM was introduced by ----------------------

a) Cruz b) Stubberd **c)Kosko** d)Rosenbatt

11)The algorithm which computes operator M is known as ------------------

a)Memory algorithm **b)Recording Algorithm** c)Transfer Algorithm d)None

12) Real coding is used by -----------------

a)Recognition of characters **b)Fabric defect identification**

c)Optimization d)Classification of soil

13)ART stands for --------------------

**a)Adaptive Resonance Theory** b)Adaptive Recent Theory

c)Adapt Resonance Theory d)Adaptive Retail Theory

14)A program --------------- is written in fortran for cluster formation

**a) Vecquent** b)Vecant c)Vector d)Quantization

15)----------------- networks were developed by carpenter and grossberg

**a)ART** b)ARP c)ARC d)ARD

16)------------------ of the network means that a pattern should not oscillate among different cluster units at different stages of training

**a)Stability** b)Mobility c)Versitality d)Placticity

17)------------------- is the analogus version of ART

**a)ART2** b)ART1 c)ART2A d)ARTMAP

18)----------------- test is incorporated into the adaptive backward network

**a)Vigilance** b)Indulgence c)Revailance d)None

19)In ---------------- learning the weights are adjusted only when the external input matches one of the stored prototypes

a)Supervised b)UnSupervised **c)Match-based** d)None

20)Kim et al. Proposed an ------------------ method using ART2 architecture.

a)Pattern Recognition **b) Chinese Recognition method**

c)Character Recognition d)None

21)--------------- learning weight update during resonance occurs rapidly

a)Error-based **b) Fast** c)Slow d)Match-based

22)Comparison layer and recognition layer constitute -----------

a)Attenuation  **b)Attenuated System**  c)Synaptic System d)None

23)ART1 is an elegant theory that address ------------------

**a)Stability – plasticity dilemma**

b)Stability dilemma

c)Plasticity dilemma

d)None

24)Supervised version of ART -----------------

**a)ARTMAP**

b)Fuzzy art

c)Fuzzy Artmap

d)ART1

25)Slow learning is used as -----------------

a)ART1

**b)ART2**

c)ARTMAP

d)Fuzzy ART

PART-B

1.Explain Auto Correlators

2.Explain HeterCorrelators

3.Explain any one application of associative memory

4.Explain Simplified ART architecture

5.Disitinguish ART1 and ART2

6.Explain any one application of ART

PART-C

7.Explain Exponential BAM

8.Explain Classical ART network

9.Explain ART1 algorithm

UNIT-3

1.Fuzziness means -------------

**a)Vagueness** b)Clear c)Precise d)Certainty

2.---------------- are pictorial representations to denote a set

a)Flow chart  **b)Venn diagram**  c)DFD d)ER diagrams

3.The number of elements in a set is called its -------------

a)modality b)placiticity  **c)Cardinality** d)elasticity

4.A set with a single element is called -----------

a)Single set  **b)Singleton set**  c)1 set d)none

5.A -------------- of a set A is the set of all possible subsets that are derivable from A including null set

**a)Power set**  b)Impower set c)Rational set d)Irrational set

6.The member ship function of fuzzy set not always be described by ----------------

a)continuous  **b)Discrete**  c)crisp d)specific

7.Fuzzy relation is a fuzzy set defined on the Cartesian product of -----------

a)single set **b)crisp set** c)union set d)intersection set

8.Raising a fuzzy set to its second power is called --------------

**a)concentration** b)intersection c)conjunction d)disjunction

9.Taking a square root of fuzzy set is called -------------------

**a)Dilemma**  b)Dual c)dialama d)none

10.Fuzzy relation associates ------------ to a varying degree of membership.

a)records **b)tuples** c)felds d)none

11.In case of => operator, the proposition occurring before the “=>” symbol is called---------

**a. antecedent** b.consequent c.conjunction d.disjunction

12. A truth table comprises rows known as -------------

**a. interpredations**  b.contradiction c.conjunction d.disjunction

13.A formula which has all its interpretations recording true is known as a ----------------

a.disjunction b.conjunction **c.tautology**  d.antecedent

14.In propositional logic, ---------------- widely used for inferring facts.

a.pones b.modus  **c.modus ponens**  d.pons

15.------------------ represent objects that do not change values

**a.constants**  b.variables c.predicates d.subject

16.------------------------ are representative of associations between objects that are constants or variables and acquire truth values.

a.Subject **b.Predicate**  c.Quantifier d.Functions

17.----------------- truth values are multivalued.

a.crisp logic b.boolean logic **c.fuzzy logic** d.none

18.Fuzzy logic propositions are also quantified by --------------

a.fuzzy b.fuzzy qualifiers **c.fuzzy quantifiers**  d.none

19.Fuzzy inference also referred to as --------------

**a.approximate reasoning** b.reasoning c.fixed reasoning d.none

20.Conversion of a fuzzy set to single crisp value is called -----------------

**a.fuzzification** b.defuzzification c.fuzzy logic d.fuzzy rule

21.--------------- obtains centre of area occupied by the fuzzy set

a.center **b.center of gravity**  c.center of area d.center point

22.The ---------------- is the arithmetic average of mean values of all intervals

a.mean  **b.mean of maxima**  c.maximum d.mean interval

23.The ------------------ are obtained by computing the minimum of the membership functions of the antecedents.

**a.rule base**  b.rule strengths c.rules d.none

24.Relative quantifiers are defined as ---------

a.0 to 10  **b.0 to 1**  c.0 d.1

25.Fuzzy cruise controller has --------------- inputs

**a.2** b.3 c.1 d.0

PART-B

1.Explain fuzzy set

2.Explain crisp set

Explain fuzzy relations

3.Distinguish between crisp logic and predicate logic

4.Explain fuzzy quantifiers

5.Explain fuzzy logic

6.Explain fuzzy inference

PART-C

1.Explain Fuzzy System

2.Explain any one of applications of Fuzzy systems

3.Explain fuzzy rule based systems.

UNIT-IV

PART-A

1.--------------- mimic the principle of natural genetics

a.Genetic programming **b.Genetic Algorithm** c.Genetic Evolution d.none

2.------------ mimics the behaviour of social insects

**a.Swarm intelligence** b.Ant colony c.Gentic Algorithm d.none

3.Possible settings of traits are called in genes -------------------

a.locus **b.alleles** c.genome d.genotype

4.------------------ means that the element of DNA is modified.

a.Recombination b.Selection **c.Mutation** d.none

5.The -------------- of an organism is measured by means of success of organism in life

a.Strength **b.fitness** c.Gene d.Chromosome

6.The space for all possible feasible solutions is called ------------------

a.space b.search **c.search space**  d.area

7.------------- is a way of representing individual genes

a.conversion **b.encoding** c.coding d.none

8.In --------------, every chromosomes is a string of numbers

a.hexadecimal encoding b.octal encoding **c.Permutation encoding**  d.none

9.------------ is the first operator applied on population.

**a.Reproduction** b.Recombination c.Mutation d.none

10.------------------ means that the genes from the already discovered good individuals are exploited

a.Diversity **b.Population diversity** c.Unity in diversity d.none

11.-------------is the degree to which the better individuals are favoured

**a.Selective pressure** b.Reproduction pressure c.Recombination pressure d.Mutation

12.The selection method which is less noisy is -----------

**a.stochastic remainder solution** b.Boltzman solution c.Remainder solution d.none

13.The ----------------- is referred the proportion of individuals in the the population which are replaced in each generation.

a.gap **b.generation gap** c.generation interval d.interval

14.Crossover operator proceeds in ------------- steps

a.4 **b.3** c.5 d.2.

15.Matrix crossover is also known as ------------

a.One dimensional **b.Two dimensional** c.Three dimensional d.none

16.------------------performs linear inversion with a specified probability of 0.75.

**a.Linear+end-inversion** b.Discrete inversion c.Continuous inversion d.Mass inversion

17.---------------- of bit involves changing bits from 0 to 1 and 1 to 0.

**a.Mutation** b.Crossover c.Inversion d.Segregation

18.-------------------- is a process in which a given bit pattern is transformed into another bit pattern by means of logical bit-wise operation.

a.Inversion b.Conversion **c.Masking** d.Segregation

19.In ------------------, inversion was applied with specified inversion probability p to each new individual when it is created.

a.Discrete **b.Continuous** c.Mass inversion d.none

20.The -------------causes all the bits in the first operand to the shifted to the left by the number of positions indicated by the second operand.

a.Shift right **b.Shift left** c.Shift operator d.none

21.A --------------- returns 1 if one of the bits have a value of 1 and the other has a value of 0 otherwise it returns a value 0.

**a.bit wise or** b.bit wise and c.not d.none

22.Population size, Mutation rate and cross over rate are together referred to as ---------------

**a.control parameters** b.central parameters c.connection parameters d.none

23.-------------selection is slow cooling of molten metal to achieve the minimum function value in a minimization problem.

**a.Boltzmann selection** b.Tournament selection c.Roulette-wheel selection d.none

24.---------------is not a particular method of selecting the parents.

**a.Steady-state** b.Elitism c.Boltzmann selection d.Tournament Selection

25.Reproduction operator is also known as ---------

a.Recombination  **b.Selection**  c.Regeneration d.none

PART-B

1.Explain biological background of genetic algorithm

2.Explain Working principle of genetic algorithm

3.Explain any two types of encoding

4.Explain inheritance operators

5.Explain Mutation operator

6.Explain Bit-wise operator

PART-C

1.Explain Reproduction operator

2.Explain Inversion and Deletion

3.Explain Generation Cycle

UNIT-5

PART-A

1.Hybrid systems is combination of neural networks, fuzzy logic and --------------

**a.Genetic Algorithm**  b.Genetic Programming c.Genetic d.none

2.In -------------, one technology calls the other as a subroutine to process or manipulate information needed by it.

**a.Auxiliary hybrid systems**  b.Embedded hybrid systems

c.sequential hybrid systems d.none

3.------------hyrbid systems make use of technologies in a pipeline fashion.

a.auxialiary hybrid systems b.embedded hybrid systems

**c.sequential hybrid systems**  d.none

4.--------------hyrbid systems the technologies participating are integerated in such a manner that they appear interwined.

a.auxialiary hybrid systems **b.embedded hybrid systems**

c.sequential hybrid systems d.none

5.------------- deals with uncertainty problems with its own merits and demerits

**a.neuro –fuzzy**  b.neuro-genetic c.fuzzy –genetic d.none

6.Neural network can learn various tasks from -------------

**a.training**  b.testing c.learning d.none

7.-------------exhibit non-linear functions to any desired degree of accuracy

a.neuro –fuzzy b.neuro-genetic  **c.fuzzy –genetic**  d.none

8.---------------- use to determine the weights of a multilayer feedforward network with backpropagation learning

a.neuro –fuzzy  **b.neuro-genetic**  c.fuzzy –genetic d.none

9.------------------ fuzzy input vectors to crisp outputs

**a.Fuzzy – backpropagation** b.neuro –fuzzy c.neuro-genetic d.fuzzy –genetic

10.----------------is a neuro-fuzzy hybrid in which the host is a recurrent network with a kind of competitive learning.

**a.Fuzzy ARTMAP** b.Fuzzy art c.ARTMAP d.none

11.FAM Stands for ------------

a.Fuzzy Associative Memory b.Fuzzy association memory

c.Fuzzy Assist Memory d.none

12.---------------maps fuzzy sets and can encode fuzzy rules.

**a.FAM**  b.Fuzzy c.ART d.none

13.Fuzzy truck backer-upper system is application of ---------------

a.FAM b.Fuzzy ART c.ART d.none

14.----------------- applicable on fuzzy optimization problems

**a.Fuzzy-genetic**  b.neuro – fuzzy c.fuzzy-logic d.fuzzy-backpropagation

15.--------------learning have reported difficulties in learning the topology of the networks whose weights they optimize

**a.Gradient descent learning** b.descent learning c.Gradient learning d.none

16.Applying neuronal learning capabilities to fuzzy systems is knowns as ---------

**a.NN driven fuzzy reasoning** b.fuzzy driven nn reasoning

c.neural network reasoning d.none

17.---------- can be applicable to mathematical relationship

**a. neuro-fuzzy** b.fuzzy-neuro c.neuro-network d.none

18.------------- is a multilayer feedforward network architecture with gradient learning.

**a.backpropagation** b.forward propagation c.Propagation d.none

19. Recurrent network architectures adopting -------------

**a.hebbian learning** b.supervised learning c.unsupervised learning d.reinforced learning

20.------------ set have no crisp boundaries

**a.fuzzy** b.boolean c.crisp set d.none

21.GA-NN also known as -----------

**a.GANN**  b.NNGA c.GA d.none

22.Image recognition under noisy is application of --------

a.Fuzzy **b.Fuzzy art** c.art d.none

23.Genetic algorithm ------------- uses to determine optimization

**a.fitness function**  b.fit function c.strength function d.none

24.------------proposed neuro –fuzzy system

**a.lee and lie** b.kosko c.gradient d.lee

25.Knowledge-based evaluation and earthquake damage evaluation is application of -----------

**a.fuzzy-backpropagation** b.neuro-fuzzy c.fuzzy d.none

PART-B

1.Explain neuro-fuzzy hybrids

2.Explain neuro-genetic hybrids

3.Explain fuzzy-genetic hybrids

4.Explain fuzzy-backpropagation network

5.Explain FAM

PART-C

1.Explain Hybrid Systems

2.Explain Fuzzy ARTMAP

3.Explain GA based backpropagation network