



1. What is a neuron in the context of neural networks ?
  - (A) A type of memory storage unit
  - (B) A fundamental building block of neural networks
  - (C) A data structure used for input/output operations
  - (D) A component of the CPU
  
2. What is a synapse in neural networks ?
  - (A) A type of artificial neuron
  - (B) A mathematical function used for activation
  - (C) A component of the CPU
  - (D) A connection between neurons where information is transmitted
  
3. What is an artificial neuron ?
  - (A) A mathematical model inspired by biological neurons
  - (B) A neuron made of artificial materials
  - (C) A type of memory unit in a computer
  - (D) A component of the GPU
  
4. What is an activation function in neural networks ?
  - (A) A component of the CPU
  - (B) A type of memory storage unit
  - (C) A function used to determine the output of a neuron
  - (D) A type of data structure used for storing input
  
5. What is the architecture of a single-layer neural network ?
  - (A) It consists of only one neuron.
  - (B) It consists of multiple layers of neurons.
  - (C) It consists of a single neuron with multiple inputs and one output.
  - (D) It does not have any neurons.
  
6. What is a feedforward network ?
  - (A) A network where information flows only in one direction.
  - (B) A network where information flows in both directions.
  - (C) A network with multiple layers of neurons.
  - (D) A network without any neurons.

7. What is a recurrent network ?
- (A) A network where information flows only in one direction.
  - (B) A network where information flows in both directions.
  - (C) A network with multiple layers of neurons.
  - (D) A network where neurons are connected in loops.
8. What is the convergence rule in neural networks ?
- (A) A rule that determines when the network has reached a stable state.
  - (B) A rule that determines the rate of learning in the network.
  - (C) A rule that determines the activation function of neurons.
  - (D) A rule that determines the architecture of the network.
9. What is supervised learning in neural networks ?
- (A) Learning with labelled data where the desired output is known.
  - (B) Learning with unlabelled data where the desired output is unknown.
  - (C) Learning without any input data.
  - (D) Learning without any output data.
10. What is unsupervised learning in neural networks ?
- (A) Learning with labelled data where the desired output is known.
  - (B) Learning with unlabelled data where the desired output is unknown.
  - (C) Learning without any input data.
  - (D) Learning without any output data.

11. The truth values of traditional set theory can be defined as \_\_\_\_\_ and that of fuzzy logic is termed as \_\_\_\_\_.
- (A) Either 0 or 1, either 1 or 1  
 (B) Between 1 & 1, either 0 or 1  
 (C) Either 0 or 1, between 0 & 1  
 (D) Between 0 & 1, between 0 & 1
12. The probability density function is represented by :
- (A) table  
 (B) graph  
 (C) mathematical equation  
 (D) Both (B) and (C)
13. How many types of Artificial Neural Networks are there ?
- (A) 3  
 (B) 2  
 (C) 4  
 (D) 5
14. Neural Networks consist of artificial neurons that are similar to the biological model of neurons.
- (A) True  
 (B) False  
 (C) Not cleared  
 (D) None of the above
15. What is the perceptron model ?
- (A) A model of a multilayer neural network  
 (B) A type of activation function  
 (C) A model of a single-layer neural network  
 (D) A mathematical equation for calculating error
16. In a perceptron model, what is the solution provided by the network ?
- (A) Optimization of the activation function  
 (B) Classification of input data into two categories  
 (C) Generation of random weights  
 (D) Calculation of the learning rate

17. What is a multilayer perceptron model ?

- (A) A model with only one layer of neurons
- (B) A model with multiple layers of neurons
- (C) A model with no activation function
- (D) A model without any connections between neurons

18. What is the purpose of back propagation learning methods ?

- (A) To propagate errors backward through the network
- (B) To propagate input data forward through the network
- (C) To calculate the learning rate of the network
- (D) To generate random weights for the neurons

19. How does the learning rule coefficient affect the back propagation algorithm ?

- (A) It determines the number of layers in the network.
- (B) It determines the activation function of the neurons.
- (C) It controls the rate at which weights are adjusted during learning.
- (D) It determines the output of the network.

20. What is the back propagation algorithm used for ?

- (A) Generating random input data
- (B) Calculating the learning rate of the network
- (C) Classifying input data into categories
- (D) Adjusting the weights of connections between neurons

21. What are some common applications of back propagation networks ?

- (A) Sorting algorithms
- (B) Database management systems
- (C) Sound processing techniques
- (D) None of the above

22. In a multilayer perceptron model, how many layers of neurons are typically present ?
- (A) One
  - (B) Two
  - (C) Three
  - (D) Four
23. Which of the following neural network architectures is used for Pattern Recognition ?
- (A) Multilayer Perceptron
  - (B) Kohonen SOM
  - (C) Feed Forward Networks
  - (D) All of the above
24. The cell body of neuron can be analogous to what mathematical operation ?
- (A) Summing
  - (B) Integrator
  - (C) Differentiator
  - (D) None of the above
25. What is Fuzzy Logic ?
- (A) A precise logic system
  - (B) A logic system dealing with uncertainty
  - (C) A binary logic system
  - (D) A logic system with only one set of rules
26. What are Fuzzy sets ?
- (A) Sets with clear boundaries
  - (B) Sets with uncertain boundaries
  - (C) Sets with only one element
  - (D) Sets with infinite elements
27. Which theory deals with Fuzzy Sets and Crisp Sets ?
- (A) Probability theory
  - (B) Boolean algebra
  - (C) Calculus
  - (D) Fuzzy Set Theory
28. What are the properties of Fuzzy Sets ?
- (A) Completeness, identity, commutativity
  - (B) Fuzziness, crispness, uncertainty
  - (C) Fuzziness, membership function, membership grade
  - (D) Membership function, membership grade, ambiguity

29. What is a Fuzzy Relation ?

- (A) A relation with uncertain boundaries
- (B) A relation with clear boundaries
- (C) A one-to-one relation
- (D) A relation with only one element

30. How can a Fuzzy Relation be converted to a Crisp Relation ?

- (A) By rounding off the values
- (B) By applying a threshold
- (C) By taking the average
- (D) By ignoring uncertain values

31. What are Membership Functions in Fuzzy Logic ?

- (A) Functions describing the degree of membership of an element in a fuzzy set
- (B) Functions determining the size of a set
- (C) Functions describing the binary relationship between elements
- (D) Functions describing the crispness of a set

32. What is Interference in Fuzzy Logic ?

- (A) The process of converting fuzzy relations to crisp relations
- (B) The process of converting crisp relations to fuzzy relations
- (C) The process of making decisions based on fuzzy rules
- (D) The process of defining membership functions

33. What are Fuzzy IF-THEN Rules ?

- (A) Rules with clear conditions and conclusions
- (B) Rules with only one condition
- (C) Rules with multiple conclusions
- (D) Rules with uncertain conditions and conclusions

34. What are Fuzzy Functions ?

- (A) Functions with uncertain inputs and outputs
- (B) Functions with clear inputs and outputs
- (C) Functions with only one input
- (D) Functions with linear relationships

35. What is Defuzzification in Fuzzy Logic ?
- (A) The process of converting crisp values to fuzzy values
  - (B) The process of converting fuzzy values to crisp values
  - (C) The process of determining membership grades
  - (D) The process of applying fuzzy rules
36. How can Fuzzy Sets and Crisp Sets be distinguished ?
- (A) By their shapes
  - (B) By their sizes
  - (C) By their boundaries
  - (D) By their membership functions
37. What does Fuzzy Set Theory primarily deal with ?
- (A) Sets with clear boundaries
  - (B) Sets with only one element
  - (C) Sets with infinite elements
  - (D) Sets with uncertain boundaries
38. Which of the following is a property of Fuzzy Sets ?
- (A) Completeness
  - (B) Crispness
  - (C) Fuzziness
  - (D) Identity
39. What are Genetic Algorithms (GAs) primarily used for ?
- (A) Solving mathematical equations
  - (B) Finding optimal solutions to complex problems
  - (C) Sorting data
  - (D) Generating random numbers
40. What is the basic working principle of Genetic Algorithms ?
- (A) Mimicking the process of natural selection and evolution
  - (B) Solving differential equations
  - (C) Executing a sequence of logical operations
  - (D) Generating random permutations
41. What are the typical procedures involved in Genetic Algorithms ?
- (A) Sorting, searching and merging
  - (B) Summation, subtraction, multiplication and division
  - (C) Input, process and output
  - (D) Initialization, selection, crossover and mutation



42. What is the purpose of initialization in Genetic Algorithms ?
- (A) To evaluate the fitness of individuals
  - (B) To perform crossover operations
  - (C) To generate random solutions to the problem
  - (D) To select the best individuals for the next generation
43. Which of the following represents the flow chart of Genetic Algorithm ?
- (A) A tree structure
  - (B) A directed graph
  - (C) A sequence of steps involving initialization, selection, crossover and mutation
  - (D) A decision tree
44. What does genetic representation (encoding) involve in Genetic Algorithms ?
- (A) Representing solutions as strings of symbols
  - (B) Evaluating the fitness of individuals
  - (C) Selecting the best individuals for reproduction
  - (D) Performing crossover operations
45. What are genetic operators in Genetic Algorithms ?
- (A) Operations that manipulate genetic representations
  - (B) Arithmetic operations
  - (C) Logical operations
  - (D) Sorting operations
46. What is mutation in Genetic Algorithms ?
- (A) A process of selecting the fittest individuals
  - (B) A crossover operation
  - (C) An initialization process
  - (D) A random change in the genetic representation of an individual
47. What does the generational cycle refer to in Genetic Algorithms ?
- (A) The process of selecting parents for reproduction
  - (B) The process of evaluating the fitness of individuals
  - (C) The sequence of operations performed in one iteration of the algorithm
  - (D) The process of initializing the population

48. How do Genetic Algorithms mimic natural selection ?
- (A) By randomly selecting individuals for reproduction
  - (B) By performing crossover operations
  - (C) By evaluating the fitness of individuals and selecting the fittest for reproduction
  - (D) By generating random solutions to the problem
49. What is the primary objective of initialization in Genetic Algorithms ?
- (A) To evaluate the fitness of individuals
  - (B) To generate random solutions to the problem
  - (C) To perform crossover operations
  - (D) To select the best individuals for the next generation
50. What are genetic operators primarily responsible for in Genetic Algorithms ?
- (A) Manipulating genetic representations
  - (B) Performing arithmetic operations
  - (C) Executing logical operations
  - (D) Sorting individuals based on fitness
51. Feedback connection strength are usually :
- (A) Variable
  - (B) Fixed
  - (C) Both fixed and variable
  - (D) None of the above
52. What is Soft Computing primarily concerned with ?
- (A) Precise and deterministic solutions
  - (B) Fuzzy and probabilistic solutions
  - (C) Binary and Boolean solutions
  - (D) Exact and analytical solutions

53. Which of the following is a characteristic of Soft Computing techniques ?
- (A) High computational complexity
  - (B) Limited adaptability to uncertainty
  - (C) Robustness and tolerance for imprecision
  - (D) Dependence on precise data
54. What is the main goal of Soft Computing ?
- (A) Achieving absolute accuracy in computations
  - (B) Emulating human-like decision-making processes
  - (C) Minimizing computational resources
  - (D) Solving problems with crisp logic
55. Which of the following is NOT a component of Soft Computing ?
- (A) Fuzzy logic
  - (B) Artificial neural networks
  - (C) Genetic algorithms
  - (D) Deterministic algorithms
56. What is Fuzzy Logic mainly used for in Soft Computing ?
- (A) Handling uncertainty and imprecision
  - (B) Performing exact computations
  - (C) Processing crisp data
  - (D) Implementing binary decision-making
57. How do Artificial Neural Networks (ANNs) emulate human-like decision-making ?
- (A) By using fuzzy logic rules
  - (B) By applying deterministic algorithms
  - (C) By relying on crisp data
  - (D) None of the above
58. What is the primary advantage of Genetic Algorithms (GAs) in Soft Computing ?
- (A) Robustness in handling noisy data
  - (B) High computational complexity
  - (C) Limited adaptability to uncertainty
  - (D) Dependency on precise inputs

59. Which Soft Computing technique is inspired by the process of natural selection ?
- (A) Genetic algorithms
  - (B) Fuzzy logic
  - (C) Artificial neural networks
  - (D) Deterministic algorithms
60. What distinguishes Soft Computing from traditional computing approaches ?
- (A) Exact and deterministic solutions
  - (B) Tolerance for imprecision and uncertainty
  - (C) Dependency on precise data
  - (D) Inability to handle real-world problems
61. What role do fuzzy sets play in Soft Computing ?
- (A) They provide exact boundaries for sets
  - (B) They eliminate ambiguity in data
  - (C) They represent uncertainty and vagueness
  - (D) They rely on crisp values for computation
62. Which Soft Computing technique is primarily used for optimization and search problems ?
- (A) Fuzzy Logic
  - (B) Artificial Neural Networks
  - (C) Deterministic Algorithms
  - (D) Genetic Algorithms
63. What is the primary advantage of Soft Computing techniques ?
- (A) Exact solutions to complex problems
  - (B) Dependency on precise data
  - (C) Limited computational complexity
  - (D) Tolerance for imprecision and uncertainty
64. How do Artificial Neural Networks (ANNs) contribute to Soft Computing ?
- (A) By providing deterministic solutions
  - (B) By relying on crisp data
  - (C) By mimicking human-like decision-making processes
  - (D) By eliminating uncertainty

65. What distinguishes Genetic Algorithms (GAs) from other optimization techniques ?
- (A) Exact solutions to complex problems
  - (B) Robustness in handling noisy and incomplete information
  - (C) Dependency on precise data
  - (D) Limited adaptability to uncertainty
66. Feedback networks are used for :
- (A) Autoassociation
  - (B) Pattern Storage
  - (C) Both (A) and (B)
  - (D) None of the above
67. Which of the following is NOT a characteristic of Soft Computing techniques ?
- (A) Exact and deterministic solutions
  - (B) Tolerance for imprecision and uncertainty
  - (C) Robustness and adaptability
  - (D) None of the above
68. What is the basic building block of a neural network ?
- (A) Nodes
  - (B) Weights
  - (C) Neurons
  - (D) Inputs
69. What is the function of an activation function in a neural network ?
- (A) To store information
  - (B) To adjust weights
  - (C) To perform calculations
  - (D) To introduce non-linearity
70. What is the process of adjusting the weights of connections in a neural network called ?
- (A) Back propagation
  - (B) Activation
  - (C) Training
  - (D) Testing
71. What is the purpose of the bias term in a neuron ?
- (A) To store information
  - (B) To connect neurons
  - (C) To introduce non-linearity
  - (D) To adjust the output of the neuron

72. What is the input layer of a neural network responsible for ?
- (A) Storing information
  - (B) Processing input data
  - (C) Adjusting weights
  - (D) Outputting results
73. What is the output layer of a neural network responsible for ?
- (A) Processing input data
  - (B) Storing information
  - (C) Outputting results
  - (D) Adjusting weights
74. Which type of neural network architecture allows information to flow in only one direction ?
- (A) Feed-forward neural network
  - (B) Recurrent neural network
  - (C) Convolutional neural network
  - (D) Radial basis function network
75. Which activation function is commonly used in the hidden layers of a neural network ?
- (A) Sigmoid
  - (B) ReLU (Rectified Linear Unit)
  - (C) Tanh (Hyperbolic Tangent)
  - (D) Linear
76. Which neural network architecture is suitable for sequential data processing ?
- (A) Feed-forward neural network
  - (B) Recurrent neural network
  - (C) Convolutional neural network
  - (D) Radial basis function network
77. What is the primary objective of back propagation in neural networks ?
- (A) To propagate input data forward through the network
  - (B) To adjust the activation function of neurons
  - (C) To initialize the weights of connections
  - (D) To propagate errors backward through the network

78. What is the purpose of the activation function in a neural network ?

- (A) To store information
- (B) To perform calculations
- (C) To adjust the output of the neuron
- (D) To connect neurons together

79. Which of the following is associated with fuzzy logic ?

- (A) Many-valued logic
- (B) Crisp set logic
- (C) Two-valued logic
- (D) Binary set logic

80. The probability density function is represented by :

- (A) Probability distributions for Continuous variables
- (B) Continuous variable
- (C) Discrete variable
- (D) None of the above

81. Where can we use the Bayes' rule ?

- (A) To increase the complexity
- (B) To decrease the complexity
- (C) To answer the probabilistic query
- (D) To solve queries

82. .... represents the fuzzy logic.

- (A) IF-THEN-ELSE rules
- (B) IF-THEN rules
- (C) Both (A) and (B)
- (D) None of the above

83. Uncertainty can be represented by .....

- (A) Entropy
- (B) Fuzzy logic
- (C) Probability
- (D) All of the above

84. A perceptron can be defined as .....

- (A) A double layer auto-associative neural network
- (B) A single layer feed-forward neural network with pre-processing
- (C) A neural network with feedback
- (D) An auto-associative neural network

85. What is meant by an auto-associative neural network ?

- (A) A neural network containing no loops
- (B) A neural network having a single loop
- (C) A neural network including feedback
- (D) A single layer feed-forward neural network containing feedback

86. Which of the following is correct for the neural network ?

- (I) The training time is dependent on the size of the network.
- (II) Neural networks can be simulated on the conventional computers.
- (III) Artificial neurons are identical in operation to a biological one.

**Codes :**

- (A) Both (I) and (II) are true.
- (B) (I) is true.
- (C) All of the above
- (D) None of the above

87. Which of the following is not the promise of an artificial neural network ?

- (A) It can survive the failure of some nodes.
- (B) It can handle noise.
- (C) It has inherent parallelism.
- (D) It can explain the result.

88. What is the name of the network, which includes backward links from the output to the inputs as well as the hidden layers ?

- (A) Recurrent neural network
- (B) Perceptron
- (C) Self-organizing maps
- (D) Multi-layered perceptron

89. Which of the following is true for unsupervised learning ?

- (A) Some specific output values are disclosed.
- (B) Some specific output values aren't disclosed.
- (C) No relevant inputs value is specified.
- (D) Both inputs as well outputs are specified.



90. How many types of random variables are there in Fuzzy Logic ?
- (A) 4
  - (B) 3
  - (C) 2
  - (D) 1
91. Automated vehicle is an application of .....
- (A) Supervised learning
  - (B) Reinforcement learning
  - (C) Unsupervised learning
  - (D) Active learning
92. The room temperature is hot. Here the hot (use of linguistic variable is used) can be represented by .....
- (A) Fuzzy and Crisp Set
  - (B) Crisp Set
  - (C) Fuzzy Set
  - (D) None of the above
93. What is true regarding back propagation rule ?
- (A) Hidden layers output is not all important, they are only meant for supporting input and output layers.
  - (B) It is a feedback neural network.
  - (C) Actual output is determined by computing the outputs of units for each hidden layer.
  - (D) None of the above
94. What are general limitations of back propagation rule ?
- (A) Local minima problem
  - (B) Slow convergence
  - (C) Scaling
  - (D) All of the above

95. .... algorithm that propagates errors from nodes of output to input.
- (A) Signal Propagation
  - (B) Channel Propagation
  - (C) Back propagation
  - (D) Front Propagation
96. Which rule is followed by the back propagation algorithm ?
- (A) Chain Rule
  - (B) Static Rule
  - (C) Dynamic Rule
  - (D) None of the above
97. Which parameter should be set while using back propagation ?
- (A) Number of Outputs
  - (B) Number of Gradients
  - (C) Number of Inputs
  - (D) Number of Intermediate Stages
98. Backpropagation works with ..... neural networks.
- (A) Single layered
  - (B) Multi-layered
  - (C) Fixed layered
  - (D) Dynamic layered
99. Which layer in the back propagation algorithm is utilized for adjusting weights ?
- (A) Hidden layer
  - (B) Input layer
  - (C) Intermediate layer
  - (D) Output layer
100. Each connection link in ANN is linked with ..... that contains statics about the input signal.
- (A) Weights
  - (B) Bias
  - (C) Neurons
  - (D) Activation function