



## BRAINWARE UNIVERSITY

### Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Computer Science

Course Name – Soft Computing

Course Code - BCS504

Semester / Year - Semester V

Time allotted : 85 Minutes

Full Marks : 70

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 70=70

1. (Answer any Seventy)

(i) Core of soft Computing is

- |  |   |
|--|---|
| a) Fuzzy Computing, Neural Computing, Genetic Algorithms | b) Fuzzy Networks and Artificial Intelligence |
| c) Artificial Intelligence and Neural Science            | d) Neural Science and Genetic Science         |

(ii) Who initiated the idea of Soft Computing

- |                   |                  |
|-------------------|------------------|
| a) Charles Darwin | b) Lofti A Zadeh |
| c) Rechenberg     | d) Mc_Culloch    |

(iii) Machine learning is

- |   |   |
|---|---|
| a) The autonomous acquisition of knowledge through the use of computer programs | b) The autonomous acquisition of knowledge through the use of manual programs |
| c) The selective acquisition of knowledge through the use of computer programs  | d) The selective acquisition of knowledge through the use of manual programs  |

(iv) How many types of agents are there in artificial intelligence?

- |      |      |
|------|------|
| a) 1 | b) 2 |
| c) 3 | d) 4 |

(v) What are the composition for agents in artificial intelligence

- a) Program
- b) Architecture
- c) Both Program & Architecture
- d) None of these

(vi) Fuzzy Computing

- a) mimics human behavior
- b) does not deal with 2 valued logic
- c) deals with information which is vague, imprecise, uncertain, ambiguous, inexact, or probabilistic
- d) All of these

(vii) The values of the set membership is represented by

- a) Discrete Set
- b) Degree of truth
- c) Probabilities
- d) Both Degree of truth & Probabilities

(viii) Let's assume that a fuzzy set A is defined as follows:  $A = 0.1/50 + 0.3/60 + 0.5/70 + 0.8/80 + 1/90 + 1/100$ . What will be the value of  $|A|$ ?

- a) 3.7
- b) 6
- c) 1.7
- d) None of these

(ix) Every fuzzy complement has at most

- a) two equilibrium
- b) three equilibrium
- c) one equilibrium
- d) None of these.

(x) Fuzzy logic is usually represented as

- a) IF-THEN-ELSE rules
- b) IF-THEN rules
- c) Both IF-THEN-ELSE rules & IF-THEN rules
- d) None of these

(xi) \_\_\_\_\_ is/are the way/s to represent uncertainty.

- a) Fuzzy Logic
- b) Probability
- c) Entropy
- d) All of these

(xii) The membership functions are generally represented in

- a) Tabular Form
- b) Graphical Form
- c) Mathematical Form
- d) Logical Form

(xiii) Membership function can be thought of as a technique to solve empirical problems on the basis of

- a) knowledge
- b) examples
- c) learning
- d) experience

(xiv) Three main basic features involved in characterizing membership function are

- a) Intuition, Inference, Rank Ordering
- b) Fuzzy Algorithms, Neural network, Genetic Algorithm
- c) Core, Support, Boundary
- d) Weighted Average, center of Sums, Median

(xv) What is meant by probability density function

- a) probability distributions
- b) Continuous variable
- c) discrete variable
- d) probability distributions for Continuous variables

(xvi) The room temperature is hot. Here the hot (use of linguistic variable is used can be)

- a) Fuzzy set
- b) Crisp set
- c) Both Fuzzy set & Crisp set
- d) None of these

(xvii) How many types of random variables are available

- a) 1
- b) 2
- c) 3
- d) 4

(xviii) The truth values of traditional set theory is

- a) Either 0 or 1
- b) 0
- c) 1
- d) None of these

(xix) There are also other operators, more linguistic in nature, called \_\_\_\_\_ that can be applied to fuzzy set theory.

- a) Hedges
- b) Lingual Variable
- c) Fuzz Variable
- d) None of these

(xx) The height  $h(A)$  of a fuzzy set  $A$  is defined as  $h(A) = \sup A(x)$

- a)  $h(A) = 0$
- b)  $h(A) < 0$
- c)  $h(A) = 1$
- d)  $h(A) < 1$

(xxi) What are the following sequence of steps taken in designing a fuzzy logic machine ?

- a) Fuzzification ? Rule evaluation ? Defuzzification
- b) Fuzzification ? Defuzzification ? Rule evaluation
- c) Rule evaluation ? Fuzzification ? Defuzzification
- d) Rule evaluation ? Defuzzification ? Fuzzification

(xxii) \_\_\_\_\_ are algorithms that learn from their more complex environments (hence eco) to generalize, approximate and simplify solution logic

- a) Fuzzy Relational DB
- b) Ecorithms
- c) Fuzzy Set
- d) None of these

(xxiii) What is the form of Fuzzy logic

- a) Two-valued logic
- b) Crisp set logic
- c) Many-valued logic
- d) Binary set logic

(xxiv) The region of the universe that is characterized by complete membership in the set is called?

- a) Core
- b) Support

c) Boundary

d) Fuzzy

(xxv) In a Fuzzy set a prototypical element has a value

a) 1

b) 0

c) infinite

d) None of these

(xxvi) A fuzzy set where no membership function has its value equal to 1 is called

a) subnormal fuzzy sets

b) normal fuzzy set

c) convex fuzzy set

d) concave fuzzy set

(xxvii) Perceptron is

a) General class of approaches to a problem.

b) Performing several computations simultaneously

c) Structures in a database those are statistically relevant

d) Simple forerunner of modern neural networks, without hidden layers.

(xxviii) In supervised learning

a) classes are not predefined

b) classes are predefined

c) classes are not required

d) classification is not done

(xxix) The Hebbian learning rule is ..... type of learning.

a) supervised

b) competitive

c) Boltzmann

d) Reinforcement

(xxx) Artificial neural network used for

a) Pattern Recognition

b) Classification

c) Clustering

d) All of these

(xxxix) A Neural Network can answer

a) For Loop questions

b) what-if questions



(xxxviii) Search space

- a) The large set of candidate solutions possible for a problem
- b) The information stored in a database that can be retrieved with a single query.
- c) Worth of the output of a machine learning program that makes it understandable for humans
- d) None of these

(xxxix) Shallow knowledge

- a) The large set of candidate solutions possible for a problem
- b) The information stored in a database that can be retrieved with a single query
- c) Worth of the output of a machine learning program that makes it understandable for humans
- d) All of these

(xl) Quantitative attributes are

- a) A reference to the speed of an algorithm, which is quadratically dependent on the size of the data
- b) Attributes of a database table that can take only numerical values
- c) Tools designed to query a database
- d) All of these

(xli) Factors which affect the performance of learner system does not include

- a) Representation scheme used
- b) Training scenario
- c) Type of feedback
- d) Good data structures

(xlii) Different learning methods does not include

- a) Memorization
- b) Analogy
- c) Deduction
- d) Introduction

(xliii) A model of language consists of the categories which does not include

- a) Language units
- b) Role structure of units
- c) System constraints
- d) Structural units

(xliv) What is a top-down parser?

- a) Begins by hypothesizing a sentence (the symbol S) and successively predicting lower level constituents until individual preterminal symbols are written
- b) Begins by hypothesizing a sentence (the symbol S) and successively predicting upper level constituents until individual preterminal symbols are written
- c) Begins by hypothesizing lower level constituents and successively predicting a sentence (the symbol S)
- d) Begins by hypothesizing upper level constituents and successively predicting a sentence (the symbol S)

(xlv) What is the rule of simple reflex agent

- a) Simple-action rule
- b) Condition-action rule
- c) Simple & Condition-action rule
- d) None of these

(xlvi) Neuro software is:

- a) A software used to analyze neurons
- b) It is powerful and easy neural network
- c) Designed to aid experts in real world
- d) It is software used by Neurosurgeon

(xlvii) The competition in upper subnet of hamming network continues till?

- a) only one unit remains negative
- b) all units are destroyed
- c) output of only one unit remains positive
- d) None of these

(xlviii) What happens in upper subnet of the hamming network?

- a) classification
- b) storage
- c) output
- d) none of these

(xlix) Which is true for neural networks?

- a) It has set of nodes and connections
- b) Each node computes it's weighted input
- c) Node could be in excited state or non-excited state
- d) None of these

(l) What is shape of dendrites like

- a) oval
- b) round



c) tree

d) rectangular

(li) The fundamental unit of network is

a) brain

b) nucleus

c) neuron

d) axon

(lii) Each connection link in ANN is associated with \_\_\_\_\_ which has information about the input signal

a) Neurons

b) Weights

c) Bias

d) activation function

(liii) Internal state of neuron is called \_\_\_\_\_, is the function of the inputs the neurons receives

a) Weight

b) activation or activity level of neuron

c) Bias

d) None of these

(liv) Neuron can send \_\_\_\_\_ signal at a time.

a) Multiple

b) One

c) None

d) any number of

(lv) Back propagation is a learning technique that adjusts weights in the neural network by propagating weight changes.

a) Forward from source to sink

b) Backward from sink to source

c) Forward from source to hidden nodes

d) Backward from sink to hidden node

(lvi) Identify the following activation function :  $f(V) = \frac{Z}{1 + \exp(-X * V + Y)}$ , Z, X, Y are parameters

a) Step function

b) Ramp function

c) Sigmoid function

d) Gaussian function

(lvii) An artificial neuron receives n inputs  $x_1, x_2, x_3, \dots, x_n$  with weights

$w_1, w_2, \dots, w_n$  attached to the input links. The weighted sum \_\_\_\_\_ is computed to be passed on to a non-linear filter ? called activation function to release the output.

- a) ?  $w_i$
- b) ?  $x_i$
- c) ?  $w_i * x_i$
- d) None of these

(lviii) How does the transmission/pulse acknowledged

- a) by lowering electric potential of neuron body
- b) by raising electric potential of neuron body
- c) both by lowering & raising electric potential
- d) None of these

(lix) Slots and facets are used in

- a) Semantic Networks
- b) Frames
- c) Rules
- d) All of these

(lx) What is charge at protoplasm in state of inactivity

- a) positive
- b) negative
- c) neutral
- d) may be positive or negative

(lxi) Which action is faster pattern classification or adjustment of weights in neural nets?

- a) pattern classification
- b) adjustment of weights
- c) equal
- d) either of them can be fast, depending on conditions

(lxii) What is the feature of ANNs due to which they can deal with noisy, fuzzy, inconsistent data?

- a) associative nature of networks
- b) distributive nature of networks
- c) both associative & distributive
- d) none of these

(lxiii) What was the name of the first model which can perform weighted sum

of inputs?

- a) McCulloch-pitts neuron model
- b) Marvin Minsky neuron model
- c) Hopfield model of neuron
- d) none of these

(lxiv) Who developed the first learning machine in which connection strengths could be adapted automatically?

- a) McCulloch-pitts
- b) Marvin Minsky
- c) Hopfield
- d) none of these

(lxv) Negative sign of weight indicates?

- a) excitatory input
- b) inhibitory input
- c) excitatory output
- d) inhibitory output

(lxvi) The amount of output of one unit received by another unit depends on what?

- a) output unit
- b) input unit
- c) activation value
- d) weight

(lxvii) The process of adjusting the weight is known as?

- a) activation
- b) synchronisation
- c) learning
- d) none of these

(lxviii) In what ways can output be determined from activation value?

- a) deterministically
- b) stochastically
- c) both deterministically & stochastically
- d) none of these

(lxix) How can output be updated in neural network?

- a) synchronously
- b) asynchronously
- c) both synchronously & asynchronously
- d) none of these

(lxx) What are the advantages of neural networks over conventional computers?

(i) They have the ability to learn by example (ii) They are more fault tolerant  
(iii) They are more suited for real time operation due to their high  
'computational' rates

a) All of these

b) ii and iii

c) i,ii

d) None of these