BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Master of Technology in Computer Science & Engineering
Course Name – Computational Intelligence
Course Code - PCC-MCS202
(Semester II)

Time allotted : 1 Hrs.15 Min. **Full Marks : 60**

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

Choose the correct alternative from the following :

(1) _____ refers to the discrepancy among a computed, observed or measured value and the true specified or theoretically correct values.

a) Fault b) Failure
c) Defect d) Error

(2) Ranking is a technique used for

a) Deleting undesirable members of the population. b) Obtaining the selection probabilities for reproduction.
c) Copying the fittest member of each population into the mating pool. d) Preventing too many similar individuals from surviving to the next generation.

(3) In a rule based system, procedural domain knowledge is in the form

a) Production rules b) Rule interpreters
c) Control rules d) Meta rules

(4) Which of the following is being investigated as a means of automating the creation of a knowledge base?

a) automatic knowledge acquisition b) simpler tools
c) discovery of new concepts d) all of the mentioned

(5) The Blocks World Problem in Artificial Intelligence is normally discussed to explain a _____

a) Search technique b) Planning system
c) Constraint satisfaction system d) Knowledge base system

(6) An intelligent robot

a) Respond to changes in its environment b) Follows instruction

c) Possesses no more intelligent than a dishwasher
d) All of the above

(7) For speech understanding systems to gain widespread acceptance in office automation, they must feature

a) speaker independence
b) speaker dependence
c) isolated word recognition
d) all of the above

(8) In supervised learning

a) classes are not predefined
b) classes are predefined
c) classes are not required
d) classification is not done

(9) Input segments of AI programming contain(s)

a) sound
b) smell
c) touch
d) all of the above

(10) Which approach to speech recognition avoids the problem caused by the differences in the way words are pronounced according to context?

a) continuous speech recognition
b) connected word recognition
c) solated word recognition
d) speaker-dependent recognition

(11) A series of AI systems developed by Pat Langley to explore the role of heuristics in scientific discovery.

a) RAMD
b) BACON
c) CU
d) MIT

(12) The intelligent agents sense through_____ and take actions through_____

a) sensors, actuators
b) remote, signals
c) both a and b
d) none of these

(13) Weak AI is

a) A set of computer programs that produce output that would be considered to reflect intelligence if it were generated by humans.
b) The study of mental faculties through the use of mental models implemented on a computer.
c) The embodiment of human intellectual capabilities within a computer.
d) All

(14) When both inputs are 1, what will be the output of the pitts model NAND gate?

a) 0
b) 1
c) either 0 or 1
d) none of these

(15) Computational learning theory analyzes the sample complexity and computational complexity of

a) Forced based learning
b) Weak learning
c) Inductive learning
d) Knowledge based learning.

(16) What stage of manufacturing process has been described as “the mapping of function onto form”?

a) distribution
b) project management
c) design
d) field service

(17) In LISP, the addition 3+2 is entered as:

a) 3 add 2
b) 3 + 2
c) 3 + 2 =
d) (+ 3 2)

(18) The truth values of traditional set theory is _____ and that of fuzzy set is

_____

a) Either 0 or 1, between 0 & 1
b) Between 0 & 1, either 0 or 1
c) Between 0 & 1, between 0 & 1
d) Either 0 or 1, either 0 or 1

(19) 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 the mentioned

(20) _____ 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 the mentioned

(21) What is synchronous update in Hopfield model?

a) all units are updated simultaneously
b) a unit is selected at random and its new state is computed
c) a predefined unit is selected and its new state is computed
d) none of the mentioned

(22) For symmetric weights there exist?

a) basins of attraction corresponding to energy minimum
b) false wells
c) fluctuations in energy landscape
d) none of the mentioned

(23) For analysis of storage capacity what are the conditions imposed on Hopfield model?

a) symmetry of weights
b) asynchronous update
c) symmetry of weights and asynchronous update
d) none of the mentioned

(24) What is a Boltzmann machine?

a) A feedback network with hidden units
b) A feedback network with hidden units and probabilistic update
c) A feed forward network with hidden units
d) A feed forward network with hidden units and probabilistic update

(25) What property should a feedback network have, to make it useful for storing information?

a) accretive behavior
b) interpolative behavior
c) both accretive and interpolative behavior
d) none of the mentioned

(26) Which layer has feedback weights in competitive neural networks?

a) input layer
b) second layer
c) both input and second layer
d) none of the mentioned

(27) What conditions are must for competitive network to perform pattern clustering?

a) non linear output layers
b) connection to neighbors is excitatory and to the farther units inhibitory
c) on centre off surround connections
d) none of the mentioned fulfils the whole criteria

(28) If a competitive network can perform feature mapping then what is that network can be called?

a) self excitatory
b) self inhibitory
c) self organization
d) none of the mentioned

(29) Activation value is associated with?

a) potential at synapses
b) cell membrane potential
c) all of the mentioned
d) none

(30) What is noise saturation dilemma?

a) at saturation state neuron will stop working, while biologically it's not feasible
b) how can a neuron with limited operating range be made sensitive to nearly unlimited range of inputs
c) can be either way
d) none of the mentioned

(31) The crossover points of a membership function are defined as the elements in the universe for which a particular fuzzy set has values equal to

a) infinite
b) 1
c) 0
d) 0.5

(32) Which models belongs to main subcategory of activation models?

a) additive & subtractive activation models
b) additive & shunting activation models
c) subtractive & shunting activation models
d) all of the mentioned

(33) What was the goal of shunting activation model?

a) to make system dynamic
b) to keep operating range of activation value to a specified range
c) to make system static
d) can be either for dynamic or static, depending on inputs

(34) The membership values of the membership function are nor strictly monotonically increasing or decreasing or strictly monotonically increasing than decreasing.

a) Convex Fuzzy Set
b) Complex Fuzzy Set
c) Normal Fuzzy set
d) None of these

(35) Computer-controlled machines that mimic the motor activities of living things are :

a) Virtual reality
b) Robotics
c) Knowledge-based systems
d) Machines that think like a human

(36) State which of the following statements hold foe perceptron learning law?

a) it is supervised type of learning law
b) it requires desired output for each input
c) all of the mentioned
d) None of these

(37) What's the other name of Widrow & Hoff learning law?

a) Hebb
b) LMS
c) MMS
d) None of the mentioned

(38) Which of the following learning laws belongs to same category of learning?

a) hebbian, perceptron
b) perceptron, delta
c) hebbian, widrow-hoff
d) instar, outstar

(39) What is the nature of weights in plain hebbian learning?

a) convergent
b) divergent
c) may be convergent or divergent
d) none of these

(40) A _____ point of a fuzzy set A is a point $x \in X$ at which $\mu A(x) = 0.5$

a) Core
b) Support
c) Cross-over
d) none of these

(41) What are the following sequences 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

(42) A perceptron has input weights W1 = -3.9 and W2 = 1.1 with threshold value T = 0.3. What output does it give for the input x1 = 1.3 and x2 = 2.2?

a) -2.65
b) -2.3
c) 0
d) 1

(43) Each connection link in ANN is associated with _____ which has information about the input signal.

a) Neurons
b) Weights
c) Bias
d) activation function

(44) The membership functions are generally represented in

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

(45) A 3-input neuron is trained to output a zero when the input is 110 and a one when the input is 111. After generalization, the output will be zero when and only when the input is?

a) 000 or 110 or 011 or 101
b) 010 or 100 or 110 or 101
c) 000 or 010 or 110 or 100
d) 100 or 111 or 101 or 001

(46) What is an auto-associative network?

a) a neural network that contains no loops
b) a neural network that contains feedback
c) a neural network that has only one loop
d) a single layer feed-forward neural network with pre-processing

(47) 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

(48) Given U = {1,2,3,4,5,6,7} A = {(3, 0.7), (5, 1), (6, 0.8)} then A will be: (where ~ → complement)

a) {(4, 0.7), (2,1), (1,0.8)}
b) {(4, 0.3.): (5, 0), (6. 0.2) }
c) {(l, 1), (2, 1), (3, 0.3), (4, 1), (6,0.2), (7, 1)}
d) {(3, 0.3), (6.0.2)}

(49) Consider a fuzzy set old as defined below Old = {(20, 0.1), (30, 0.2), (40, 0.4), (50, 0.6), (60, 0.8), (70, 1), (80, 1)} Then the alpha-cut for alpha = 0.4 for the set old will be

a) {(40,0.4)}
b) {50, 60, 70, 80}
c) {(20, 0.1), (30, 0.2)}
d) {(20, 0), (30, 0), (40, 1), (50,1), (60, 1), (70, 1), (80, 1)}

(50) In a single perceptron, the updating rule of weight vector is given by

a) w(n + 1)=w(n)+η[d(n)-y(n)]
b) w(n + 1)=w(n)–η[d(n)-y(n)]
c) w(n + 1)=w(n)+η[d(n)-y(n)]* x (n)
d) w(n + 1)=w(n)–η[d(n)-y(n)]* x (n)

(51) 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) (i) and (ii) are true
b) (i) and (iii) are true
c) all of them are true
d) None of Above

(52) Associativity Property of Classical set is

a) AUB=BUA A^B=B^A
b) AU(BUC)=(AUB)UC A^(B^C)=(A^B)^C
c) AU(B^C)=(AUB)^(AUC) A^(BUC)= (A^B)U(A^C)
d) AUA=A A^A=A

(53) In Classical sets Difference Operation represented as

a) AUB={x|xEA or xEB}
b) A^B={x|xEA and xEB}
c) ~A={x|x!EA and xEX}
d) A|B={x|xEA and xEB}=A^~B

(54) Which of the following function returns t If the object is a symbol m LISP?

a) (*)
b) ( )
c) (nonnumeric)
d) (constantp)

(55) If input is 'a(l) + e' where 'e' is the noise introduced, then what is the output in case of auto associative feedback network?

a) a(l)
b) a(l) + e
c) could be either a(l) or a(l) + e
d) e

(56) If input is 'a(l) + e' where 'e' is the noise introduced, then what is the output if system is accretive in nature?

a) a(l)
b) a(l) + e
c) could be either a(l) or a(l) + e
d) e

(57) If input is 'a(l) + e' where 'e' is the noise introduced, then what is the output if system is interpolative in nature?

a) a(l)
b) a(l) + e
c) could be either a(l) or a(l) + e
d) e

(58) The update in weight vector in basic competitive learning can be represented by?

a) w(t + 1) = w(t) + del.w(t)
b) w(t + 1) = w(t)
c) w(t + 1) = w(t) – del.w(t)
d) none of the mentioned

(59) Which of the following equation represent perceptron learning law?

a) Δwij= μ(si) aj
b) Δwij= μ(bi – si) aj
c) Δwij= μ(bi – si) ajÁ(xi),where Á(xi) is derivative of xi
d) Δwij= μ(bi – (wi a)) aj

(60) A _____ point of a fuzzy set A is a point x ∈ X at which μA(x) = 0.5

a) Core
b) Support
c) Cross-over
d) α – cut