University of Mumbai

Examination 2021 under cluster KJSIEIT

Examinations Commencing from 22nd April 2021 to 30th April 2021

Program: Computer Engineering

Curriculum Scheme: Rev2019

Examination: M.E. (Artificial Intelligence) Semester I

Course Code: MEAIC101 and Course Name: Building Blocks of Artificial Intelligence

Time: 2 hours Max. Marks: 80

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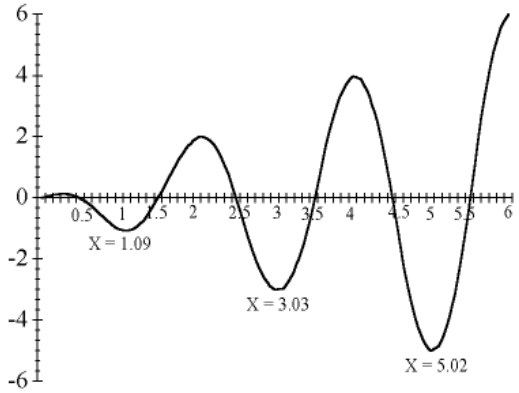
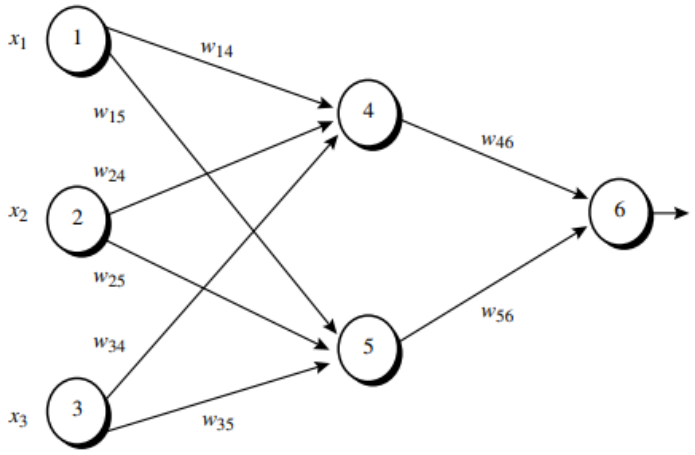
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks (2 marks each).**
1.	Which of the following best suits the context of Artificial Intelligence?
Option A:	Systems that think like humans
Option B:	Systems that think rationally
Option C:	Systems that act like humans
Option D:	Systems that act rationally
2.	Blind search can be used in:
Option A:	Real-life situations
Option B:	Small search Space
Option C:	Complex games
Option D:	Large search Space
3.	Which search algorithm checks the neighboring solutions not explored till the time?
Option A:	Depth First Search
Option B:	Beam Search
Option C:	Hill Climbing
Option D:	Tabu Search
4.	Which of the following disciplines does not strongly connect to Artificial Intelligence?
Option A:	Computer Vision
Option B:	Transaction Processing
Option C:	Information Retrieval
Option D:	Machine Learning
5.	Nodes in Neural Network that take values TRUE (T) and FALSE (F) are called _____.
Option A:	Dual Nodes
Option B:	Boolean Nodes
Option C:	Two-way Nodes
Option D:	Ordered Nodes
6.	Which of the following strategies are not used in ANN?
Option A:	Unsupervised Learning
Option B:	Reinforcement Learning
Option C:	Supreme Learning
Option D:	Supervised Learning

7.	A perceptron can be defined as:
Option A:	A single layer feed-forward neural network with pre-processing
Option B:	An auto-associative neural network
Option C:	A double layer auto-associative neural network
Option D:	A neural network that contains feedback
8.	In _____ method for defuzzification, the crisp value of the output variable is computed by finding the variable value of the centre of gravity of the membership function for the fuzzy value
Option A:	Center of Sums
Option B:	Mean of Maxima
Option C:	Mean of Minima
Option D:	Centroid
9.	For solving Travelling Salesman Optimization Problem using Genetic Algorithms, which encoding scheme is the best suited?
Option A:	Binary Encoding
Option B:	Permutation Encoding
Option C:	Tree Encoding
Option D:	Value Encoding
10.	Which parameters are randomly considered in a Neural Network?
Option A:	Weight and Bias
Option B:	Only Weights
Option C:	Activation Function
Option D:	Only Bias
11.	Which of the following is not the application of Genetic Algorithms?
Option A:	Scheduling
Option B:	Optimization
Option C:	Classification
Option D:	Management of Applications
12.	In uniform crossover, what does the mask value ‘1’ imply?
Option A:	Bits that should be ignored
Option B:	Bits that should be inverted
Option C:	Bits that should be copied from the parent to the offspring
Option D:	Bits that should not be copied from the parent to the offspring
13.	The Fuzzy Logic System Architecture does not include .
Option A:	Fuzzification Module
Option B:	Knowledge Base
Option C:	Defuzzification Module
Option D:	Activation Function
14.	Concerning fuzzy set theory, which of the following is not a fuzzy operator?
Option A:	XOR
Option B:	AND
Option C:	OR

Option D:	NOT
15.	The truth values in fuzzy logic are _____
Option A:	between 0 and 1, both exclusive
Option B:	either 0 or 1
Option C:	both 0 and 1
Option D:	between 0 and 1, both inclusive
16.	Consider a 3-input neuron with weights 1, 2, and 3. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 3, 2 and 1 respectively. What will be the output?
Option A:	10
Option B:	20
Option C:	30
Option D:	40
17.	Which operator is used to avoid local minima?
Option A:	Reproduction
Option B:	Crossover
Option C:	Mutation
Option D:	Cross-site
18.	The chromosomes with bigger fitness value will be selected more times. This statement is true for:
Option A:	Roulette Wheel Selection
Option B:	Rank Selection
Option C:	Steady-State Selection
Option D:	Elitism
19.	Consider Genetic Algorithm (GA) is applied for finding the minimum optimal value of X for any function F(X). The possible values are shown in the affixed figure. Which point will most likely be selected after the first generation of GA run? 
Option A:	X = 1.09
Option B:	X = 3.03
Option C:	X = 5.02
Option D:	X = 2.00
20.	Which of the following is not the characteristic property for representation of knowledge in Artificial Intelligence?
Option A:	Inferential Adequacy

Option B:	Representational Adequacy
Option C:	Representational Verification
Option D:	Inferential Efficiency

Q2. A	**Solve any Two out of Three** **05 marks each**
i.	Analyze and describe applications of Artificial Intelligence for Agriculture.
ii.	Differentiate Soft Computing and Hard Computing.
iii.	Explain different encoding methods in Genetic Algorithms.
Q2. B	**Solve any One out of Two** **10 marks each**
i.	Consider the following multilayer feed-forward neural network. Let the learning rate be 0.9. The initial weight and bias values of the network are given in the table below, along with the first training tuple, X = (1, 0, 1), whose class label is 1. Calculate the net input, output and error of each unit in hidden and output layer once the tuple is fed into the network. Also show updated values of weights and bias after first iteration calculating the error.
ii.	Explain any one method for defuzzification using example.



w14	w15	w24	w25	w34	w35	w46	w56	θ1	θ2	θ3
0.2	-0.3	0.4	0.1	-0.5	0.2	-0.3	-0.2	-0.4	0.2	0.1

Q3. A	**Solve any Two out of Three** **05 marks each**
i.	Analyse Travelling Salesman Problem and identify suitable Genetic Algorithm components for it.
ii.	Differentiate supervised and unsupervised learning. For solving each of the below use cases, state whether to use supervised or unsupervised learning algorithm and justify it. i. Understand consumer behaviour on your website that leads to a product getting purchases ii. Predicting customer churn based on past records iii. Segment banking customers on whether or not they will default on a loan based on the records of previous customers
iii.	Write the sequence of steps taken in designing a fuzzy logic machine.
Q3. B	**Solve any One out of Two** **10 marks each**

i.	Consider the problem of maximizing the function $f(x) = x^2$ where x is permitted to vary between 0 to 31. Solve the example using Genetic Algorithm and demonstrate the best offspring after the first generation
ii.	Explain Backpropagation algorithm in detail. Argue why weights are modified in Neural Networks.

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Question Number	Correct Option
Q1.	C
Q2.	B
Q3.	D
Q4	B
Q5	B
Q6	C
Q7	A
Q8.	D
Q9.	B
Q10.	A
Q11.	D
Q12.	C
Q13.	D
Q14.	A
Q15.	D
Q16.	B
Q17.	C
Q18.	A
Q19.	A
Q20.	C