



**NAVRACHANA
UNIVERSITY**
a UGC recognized University

ENROLLMENT NO. _____

School: School of Engineering and Technology
Program/s: B.Tech(CSE)
Year: 3rd **Semester:** 6th
Examination: End Semester Examination
Examination year: May - 2023

Course Code: CS324 **Course Name:** Artificial Intelligence
Date: 15/05/2023
Time: 02:00 am to 04:00 am

Total Marks: 40
Total Pages: 13

Instructions:

- a) Attempt All the Questions
- b) No Calculator is allowed

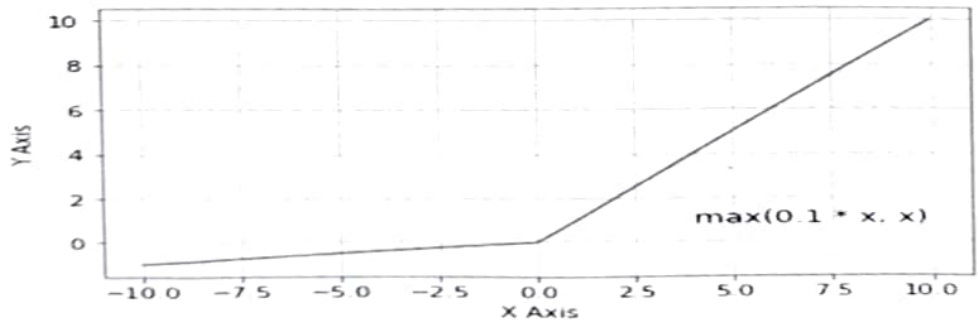
Q. No.	Details	Marks	CO	BTLO
	Attempt All the Questions(1 marks each)	40		
Q.1	Minimax algorithm is A. only Optimal B. only Complete C. Optimal and Complete D. Not Optimal, Not Complete		C02	BT1, BT2
Q.2	There is no need of using activation function in output layer in case of regression p A. True B. False		C05	BT1, BT2
Q.3	Following are the points related to K-Nearest Neighbour ML algorithm. A. It is Supervised learning algorithm B. Used for Classification problem only. C. It is Lazy algorithm D. Uses Euclidean, Manhattan and Minkowski distance to find the distance between E. Sometimes uses Hamming distance. A. Only A, B, C, D and E are true B. Only A, B, C and D are true C. Only C and D are true D. Only B, C and D are true		C05	BT2, BT3, BT4
Q.4	Chat-GPT developed by OpenAI is an example of A. Narrow AI B. General AI C. Strong AI		C01	BT1, BT2
Q.5	According to Uniform Cost Shortest path algorithm the shortest path is _____.		C02	BT2, BT3, BT4, BT5

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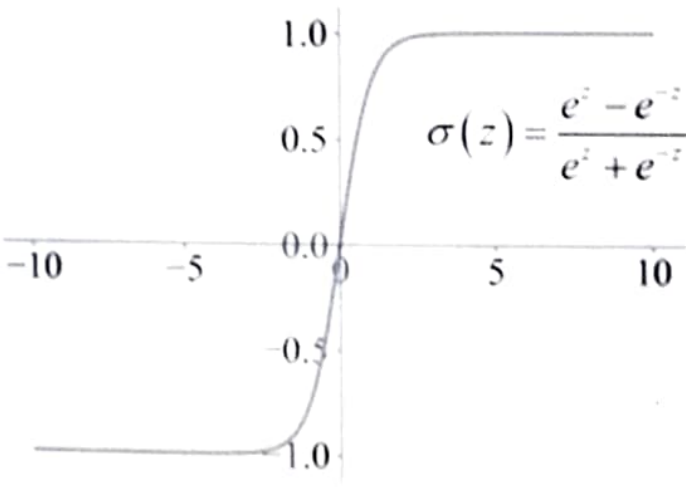
graph TD
    A["A: {'B': 2, 'C': 2}"]
    B["B: {'D': 4, 'E': 2}"]
    C["C: {'F': 2}"]
    D["D: {'G': 5}"]
    E["E: {'G': 7}"]
    F["F: {'G': 6}"]
    G["G: {}"]
    
    A --> B
    B --> C
    C --> D
    D --> E
    E --> F
    F --> G
  
```

start = 'A'
 goal = 'G'

- A. ABDG
- B. ABEG
- C. ACFG
- D. ABFG

<p>Q.6</p> <p>Area Under Curve (AUC) is the plot</p> <p>A. A plot 1-Specificity(FP rate) Vs Sensitivity(TP rate)</p> <p>B. Used to compare two or more Models.</p> <p>C. The area under curve shows truly predicted data points.</p> <p>D. The higher value of the area under AUC depicts higher accuracy</p> <p>A. A, B, C and D are true</p> <p>B. A, B and C are true</p> <p>C. C and D are true</p> <p>D. A, C and D are true</p>		C04	BT2, BT3, BT4
<p>Q.7</p> <p>To create Word Embedding model, skip-gram technique must be used if corpora is</p> <p>A. False</p> <p>B. True</p>		C05	BT1, BT2
<p>Q.8</p> <p>Select the algorithm which is more susceptible to over-fitting.</p> <p>A. Random Forest</p> <p>B. Decision Tree</p> <p>C. Gradient-Boosted Trees</p> <p>D. Extra Tree Classifier</p>		C04	BT1, BT2
<p>Q.9</p> <p>The following image depicts _____ activation function in ANN.</p>		C05	BT2, BT3, BT4

- A. ReLU
- B. Leaky ReLU
- C. Sigmoid
- D. Softmax
- E. tanh

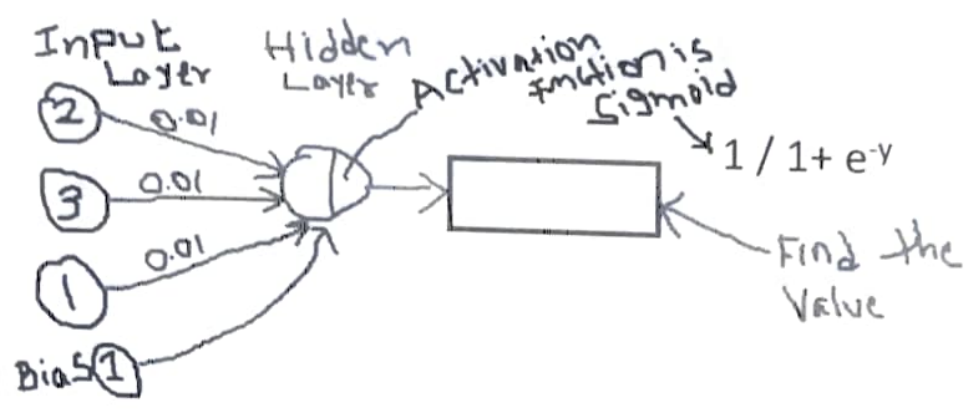
Q.10	<p>_____ algorithm is used to find line of best fit.</p> <ul style="list-style-type: none"> A. Gradient Descent B. Gradient Fall C. Gradient Lasso D. Gradient Boosted 	C05	BT1, BT2
Q.11	<p>In deep learning networks _____ optimizer is suitable for mid to large sized d high dimensional data.</p> <ul style="list-style-type: none"> A. SGD B. GD C. ADAM D. RMS-PROP 	C05	BT1, BT2
Q.12	<p>Z-Score is calculated as</p> <ul style="list-style-type: none"> A. M stands for Mean, SD stands for Standard Deviation B. less than $M-3*SD$ and greater than $M+3*SD$ C. greater than $M-3*SD$ and less than $M+3*SD$ D. less than $M-2*SD$ and greater than $M+2*SD$ E. less than $M-5*SD$ and greater than $M+5*SD$ 	C04	BT1, BT2
Q.13	<p>The following image depicts following activation function in ANN.</p>  <ul style="list-style-type: none"> A. tanh B. ReLU C. Leaky ReLU D. Sigmoid 	C05	BT2, BT3, BT4

Q.14	<p>For an image of width=9 and height=9, we must have 81 neurons in input layer. Then the next hidden layer will have how many neurons.</p> <p><input checked="" type="radio"/> 40</p> <p><input type="radio"/> 162</p> <p><input type="radio"/> 41</p> <p><input type="radio"/> No Thumb Rule available to calculate neurons in hidden layer</p>	C05	BT2, BT3, BT4, BT5
Q.15	<p>Statement : Benefits of Feature Selection</p> <p>A. Reduces Overfitting</p> <p>B. Improves Accuracy</p> <p>C. Reduces Training Time</p> <p>D. Leads to smaller size of trained model</p> <p><input type="radio"/> All are true</p> <p><input type="radio"/> A and B are true</p> <p><input type="radio"/> A and C are true</p> <p><input type="radio"/> A, B and C are true</p> <p><input type="radio"/> A, B and D are true</p>	C05	BT2, BT3, BT4

Q.16

Calculate the value of red hidden neuron after application of sigmoid function. weights are mentioned on graphs vertices in blue color (0.01) * (1 Point)

e is Eulers Constant whose value is 2.71



- 0.98
- 0.74
- 0.45
- 0.51

C05 BT2, BT3, BT4, BT5

Q.17

In CNN, if the image size is 30x30, the padding size is 4 pixels, the kernel size is 6x6, the stride is 2 then the resultant image will be of _____ dimension.

- 15x15
- 16x16
- 17x17
- 18x18
- 28x28
- 30x30

C05 BT2, BT3, BT4, BT5

Q.18

If the independent variables (X) X-Sets are boolean variables, then _____ algorithm is most suitable for Classification problem.

- Gaussian Naive Bayes Classifier.
- Multinomial Naive Bayes Classifier
- Bernoulli Naive Bayes Classifier

C05 BT2, BT3, BT4

Q.17

Choose the Feature selection methods

- A. Recursive Feature Elimination
- B. Principal Component Analysis
- C. Univariate Selection
- D. ExtraTreeClassifier
- E. Z-Score Analysis

- Only A, B and E
- Only A, B, C and E
- Only A, B, C and D
- Only A, B, D and E

Q.20

In deep learning, if the predicted values are labels like dog, cat, rat and mouse, then _____ activation function and _____ no. of neurons are needed at output layer. [1]

(1 Point)

- softmax, 4
- sigmoid, 4
- softmax, 1
- sigmoid, 1

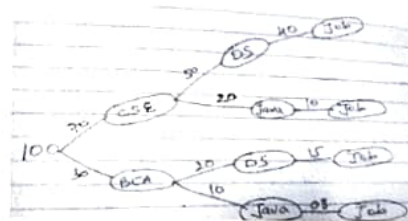
C05

BT2, BT3, BT4, BT5

Q.21

23

Consider graph below with total students 100 distributed in two courses viz CSE and BCA with DS and JAVA specialization. (Values written on edges of graph are student counts)
 Calculate conditional probability of $P(\text{Job} | \text{Java, CSE})$ [1] (1 Point)



- 0.6
- 0.33
- 0.14
- 0.2

C03


BT2, BT3, BT4, BT5

Q.23
Q.24
Q.25

Q.22	<p>Following statements are related to Backpropagation algorithm</p> <p>A. A process of finding optimal values of weights. B. The weights are learned from difference of actual output and predicted output as well as optimizers C. The Gradient Descent helps as one of the basic optimizer which finds the optimal weight value D. The loop process of back-propagation must be continued till local minima is achieved.</p> <p><input type="radio"/> All statements are true</p> <p><input type="radio"/> Statements A, B and D are true</p> <p><input type="radio"/> Statements A, B and C are true</p> <p><input type="radio"/> Statements B, C and D are true</p>	C03	BT2, BT3, BT4
Q.23	<p>Most suitable function at output layer for Binary classification is</p> <p><input type="radio"/> tanh</p> <p><input type="radio"/> sigmoid</p> <p><input type="radio"/> relu</p> <p><input type="radio"/> softmax</p>	C05	BT1, BT2
Q.24	<p>The error metric used for _____ problem is confusion matrix and for _____ problem Mean Square Error (MSE) is used.</p> <p><input type="radio"/> Regression, Classification</p> <p><input type="radio"/> Classification, Regression</p> <p><input type="radio"/> Classification, Classification</p> <p><input type="radio"/> Regression, Classification</p>	C04	BT1, BT2
Q.25	<p>Consider the following Statement below</p> <p>"AI is the future technology for all. Regarding the future of human, it is unpredictable as of now human are still intelligent, hence future is theirs."</p> <p>The conditional probability $P(\text{future} \text{the})$ and $P(\text{human} \text{now})$ is respectively _____ and _____ .</p> <p><input type="radio"/> 1, 0.66</p> <p><input type="radio"/> 1, 1</p> <p><input type="radio"/> 0.33, 0.33</p> <p><input type="radio"/> 1, 0.5</p>	C03	BT2, BT3, BT4, BT5

Q.26

The following image depicts _____ activation function in ANN.

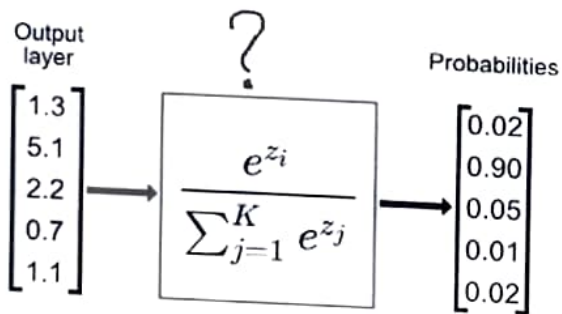
*  (1 Point)

Sigmoid

Softmax

ReLU


tanh



C03
BT2,
BT3,
BT4

Q.27

The following image depicts _____ activation function in ANN.

*  (1 Point)

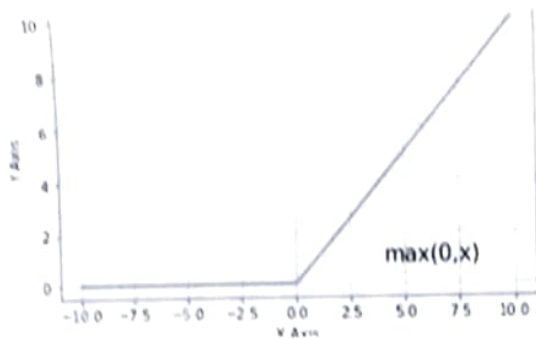
tanh

sigmoid

ReLU

softmax

C05
BT2,
BT3,
BT4



Q.28

Following statements are related to Bagging Algorithms

- A. Creates multiple trees from sample of data and average accuracy of each sample tree is considered final accuracy.
- B. Creates only one single tree instead of many. At each level accuracy is calculated and the maximum is taken.
- C. Creates graphs instead of trees to model complexity present in dataset.
- D. One of the example is Gradient Boosted Trees.

- A is True
- B is True
- C is True
- D is True

C05

BT2,
BT3,
BT4

Q.29

Most suitable function at output layer for Binary classification is

- tanh
- sigmoid
- relu
- softmax

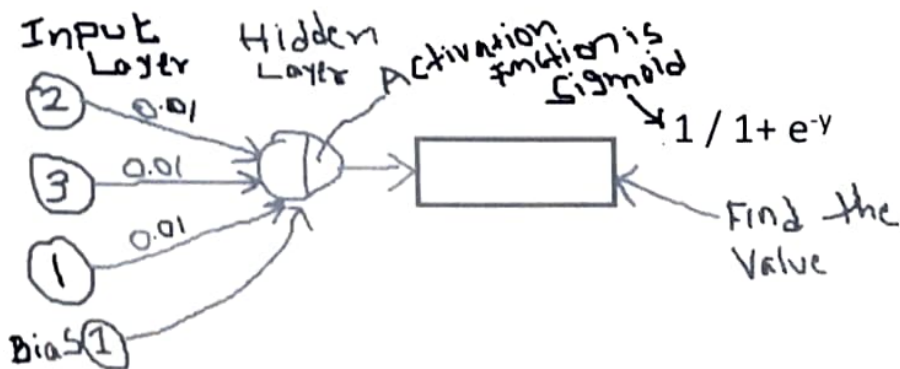
C05

BT1,
BT2

Q.30

Calculate the value of red hidden neuron after application of Sigmoid function. Weights are mentioned on graphs vertices in blue color (0.01) * e^{-1} (1 Point)

e is Eulers Constant whose value is 2.71



C05

BT2,
BT3,
BT4,
BT5

	<input type="radio"/> 0.98 <input type="radio"/> 0.74 <input type="radio"/> 0.45 <input type="radio"/> 0.51											
Q.31	<p><u>Match the following</u></p> <table border="0"> <tr> <td>1. Completeness</td> <td>A. Algorithm gives exact solution to a random input.</td> </tr> <tr> <td>2. Optimality</td> <td>B. Storage space required to algorithm execution</td> </tr> <tr> <td>3. Time Complexity</td> <td>C. Time required by algorithm to generate solution</td> </tr> <tr> <td>4. Space Complexity</td> <td>D. Solution is guaranteed to be the best</td> </tr> </table> <input type="radio"/> 1-A, 2-B, 3-C, 4-D <input type="radio"/> 1-A, 2-D, 3-B, 4-C <input type="radio"/> 1-A, 2-D, 3-C, 4-B <input type="radio"/> 1-D, 2-B, 3-C, 4-A	1. Completeness	A. Algorithm gives exact solution to a random input.	2. Optimality	B. Storage space required to algorithm execution	3. Time Complexity	C. Time required by algorithm to generate solution	4. Space Complexity	D. Solution is guaranteed to be the best		C02	BT1, BT2
1. Completeness	A. Algorithm gives exact solution to a random input.											
2. Optimality	B. Storage space required to algorithm execution											
3. Time Complexity	C. Time required by algorithm to generate solution											
4. Space Complexity	D. Solution is guaranteed to be the best											
Q.32	<p>Area Under Curve (AUC) is the plot</p> <p>A. A plot 1-Specificity(FP rate) Vs Sensitivity(TP rate) B. Used to compare two or more Models. C. The area under curve shows truly predicted data points. D. The higher value of the area under AUC depicts higher accuracy</p> <input type="radio"/> A, B, C and D are true <input type="radio"/> A, B and C are true <input type="radio"/> C and D are true <input type="radio"/> A, C and D are true		C05	BT2, BT3, BT4								

As shown model results in confusion matrix here. Here the model has classified an animal as Cat and Not-Cat using some ML Classifier. The accuracy, precision, recall scores are _____, _____ and _____ respectively. * (1 Point)

- 82, 62, 61
- 62, 61, 82
- 61, 82, 62
- 62, 82, 61

		Actual	
		Cat	Not cat
Predicted	Cat	107	23
	Not cat	69	42

C03
BT3,
BT4,
BT5

Q.34

In deep learning, if the predicted values are labels like dog, cat, rat and mouse, then _____ activation function and _____ no. of neurons are needed at output layer. * (1 Point)

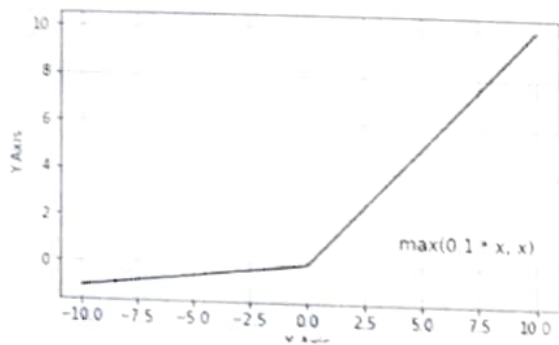
- softmax, 4
- sigmoid, 4
- softmax, 1
- sigmoid, 1

C05
BT2,
BT3,
BT4

The following image depicts _____ activation function in ANN.

* (1 Point)

- ReLU
- Leaky ReLU
- Sigmoid
- Softmax
- tanh



Q.36

Low Bias and High Variance model is considered as _____.

- Overfitted model
- Underfitted model
- Best Model

C05

BT1,
BT2

Q.37

The purpose of Convolutional Layer and Pooling layer in CNN is for dimensionality reduction.

- True
- False

C05

BT1,
BT2

D14
BT3,
BT4

Q.38	<p>Consider following two documents Doc 1 : You are on the right path as right path is beneficial. Doc 2 : The right path to travel path to Mumbai is always turn right on cross roads. The TF-IDF value of the word "right" and "Mumbai" is _____ and _____ respectively. *</p> <p>(1 Point)</p> <p><input type="radio"/> 0.30, 0.60</p> <p><input type="radio"/> 0.60, 0.30</p> <p><input type="radio"/> 0. 0.60</p> <p><input type="radio"/> 0.60, 0</p> <p><input type="radio"/> 0.60, 0.35</p>	C03 BT2, BT3, BT4, BT5
Q.39	<p>Z-Score is calculated as * <input type="checkbox"/> (1 Point)</p> <p>M stands for Mean, SD stands for Standard Deviation</p> <p><input type="radio"/> less than $M-3*SD$ and greater than $M+3*SD$</p> <p><input type="radio"/> greater than $M-3*SD$ and less than $M+3*SD$</p> <p><input type="radio"/> less than $M-2*SD$ and greater than $M+2*SD$</p> <p><input type="radio"/> less than $M-5*SD$ and greater than $M+5*SD$</p>	C03 BT2, BT3, BT4, BT5
Q.40	<p>In deep learning, if the predicted values are labels like dog, cat, rat and mouse, then _____ activation function and _____ no. of neurons are needed at output layer. *</p> <p>(1 Point)</p> <p><input type="radio"/> softmax, 4</p> <p><input type="radio"/> sigmoid, 4</p> <p><input type="radio"/> softmax, 1</p> <p><input type="radio"/> sigmoid, 1</p>	C05 BT2, BT3, BT4, BT5