Started on	Monday, 7 March 2022, 12:00 PM
State	Finished
Completed on	Monday, 7 March 2022, 1:00 PM
Time taken	59 mins 7 secs
Grade	**22.00** out of 30.00 (**73**%)

Question **1**

Complete

Mark 1.00 out of 1.00

Which activation function does not give the fuzzy output

- Exponential linear unit function
- Threshold
- Hyperbolic tangent function
- Sigmoid

The correct answer is:
Threshold

Question **2**

Complete

Mark 1.00 out of 1.00

From the given data, apply naïve bayes classification technique and predict the probability of P(N|Today), where Today={Sunny, Normal}. **Note: choose the best suitable value from the given option with exclusion of dinominator part of the bayes equation.**

Outlook	Humidity	Class
Sunny	High	N
Sunny	High	N
Overcast	High	P
Rain	High	P
Rain	Normal	P
Rain	Normal	N
Overcast	Normal	P
Sunny	High	N
Sunny	Normal	P

- 0.0621
- 0.0812
- 0.0833
- 0.0666

The correct answer is:
0.0833

Question **3**

Complete

Mark 1.00 out of 1.00

Find the correct statements about boosting tree from the given options.

1. **Individual weak learners are independent of one another in boosting trees.**
2. **It is a method for improving prediction accuracy by aggregating the results of weak learners.**

- 2
- both 1 and 2
- None of the given option is valid.
- 1

The correct answer is:
2

Question **4**

Complete

Mark 1.00 out of 1.00

Finding the class of a potential customer for a financial institution (bank), which may not be considered as an essential features

- Repay history of previous loan
- Source of income
- To visit an anonymous place by particular customer
- Total liability cost for respective user

The correct answer is:
To visit an anonymous place by particular customer

Question **5**

Complete

Mark 1.00 out of 1.00

In Random Forest, hundreds of trees can be generated to get the final predication by aggregating their outcomes. Which of the following statements about the individual tree in Random Forest is true?

1. **Each tree is constructed from a subset of the features.**
2. **Each tree is built from all of the features.**

- None of the given option is valid
- 1
- 2
- both 1 and 2

The correct answer is:
1

Question **6**

Complete

Mark 0.00 out of 1.00

From the given data, apply naïve bayes classification technique and predict the probability of P(N|Today), where Today={Rain, High}. **Note: choose the best suitable value from the given option with exclusion of dinominator part of the bayes equation.**

Outlook	Humidity	Class
Sunny	High	N
Sunny	High	N
Overcast	High	P
Rain	High	P
Rain	Normal	P
Rain	Normal	N
Overcast	Normal	P
Sunny	High	N
Sunny	Normal	P

- 0.0888
- 0.0833
- 0.0812
- 0.0828

The correct answer is:
0.0833

Question **7**

Complete

Mark 0.00 out of 1.00

Which of the following shows the upper bound of classifier error (training and test error), considering total total number of samples N and VC dimension h for small residue η.

- $\text{Training error} \leq \text{Test error} + \sqrt{\frac{h(\log(2N/h)+1)-\log \eta/4}{N}}$
- $\text{Training error} \geq \text{Test error} + \sqrt{\frac{h(\log(2N/h)+1)-\log \eta/4}{N}}$
- $\text{Test error} \leq \text{Training error} + \sqrt{\frac{h(\log(2N/h)+1)-\log \eta/4}{N}}$
- $\text{Test error} \geq \text{Training error} + \sqrt{\frac{h(\log(2N/h)+1)-\log \eta/4}{N}}$

The correct answer is:

$\text{Test error} \leq \text{Training error} + \sqrt{\frac{h(\log(2N/h)+1)-\log \eta/4}{N}}$

Question **8**

Complete

Mark 1.00 out of 1.00

Twitter receives millions of tweets per second; most tweets are general or related to a particular event like an election in a state, a war in a country, a newly released movie, etc. If you have to design a system that can cluster event-specific posts, which type of learning model will be preferable? Choose the best suitable answer from the given options.

- Reinforcement Learning
- Unsupervised Learning
- None of the given option is valid
- Supervised Learning

The correct answer is:
Unsupervised Learning

Question **9**

Complete

Mark 0.00 out of 1.00

From the given data, apply naïve bayes classification technique and predict the probability of P(P|Today), where Today={Sunny, high}. **Note: choose the best suitable value from the given option with exclusion of dinominator part of the bayes equation.**

Outlook	Humidity	Class
Sunny	High	N
Sunny	High	N
Overcast	High	P
Rain	High	P
Rain	Normal	P
Rain	Normal	N
Overcast	Normal	P
Sunny	High	N
Sunny	Normal	P

- 0.250
- 0.444
- 0.025
- 0.044

The correct answer is:
0.044

Question **10**

Complete

Mark 1.00 out of 1.00

Rahul has 2 bags. Bag 1 has 7 green and 2 yellow balls, and bag 2 has 5 green and 9 yellow balls. Rahul draws a ball at random, and it turns out to be green. Determine the ball's probability from bag 1 using the Bayes theorem.

- 0.75
- 0.36
- 0.64
- 0.58

The correct answer is:
0.64

Question **11**

Complete

Mark 0.00 out of 1.00

Which of the following statements about Gradient Boosting trees is correct?

1. **Introduce a new regression tree at each stage to compensate for the shortcomings of the existing model.**
2. **To minimise the loss function, we can not use the gradient decent method.**

- 2
- None of the given option is valid
- 1
- Both 1 and 2

The correct answer is:
1

Question **12**

Complete

Mark 1.00 out of 1.00

Which of the following statements about bagging trees is/are correct?

1. **Individual trees in bagging are related to one another.**
2. **Bagging is a technique for improving prediction accuracy by combining the outcomes of weak learners.**

- both 1 and 2
- 2
- None of the given option is correct
- 1

The correct answer is:
2

Question **13**

Complete

Mark 1.00 out of 1.00

Which of the following is used for analyzing the total error in the context of Stein's Lemma $\rightarrow \frac{1}{n}\sum_{i=1}^{n}\epsilon_i(\hat{f}(x_i) - f(x_i)) = \frac{\sigma^2}{n}\sum_{i=1}^{n}\frac{\partial\hat{f}(x_i)}{\partial y_i}$?
Note: All notations have their usual meaning.

- Model is too complex, when $\frac{\partial\hat{f}(x_i)}{\partial y_i}$ is lower.
- $\text{True error} \propto \frac{1}{Model\ Complexity}$
- Large change in observation causes a small change in the estimation.
- Small change in observation causes a large change in the estimation.

The correct answer is:
Small change in observation causes a large change in the estimation.

Question **14**

Complete

Mark 1.00 out of 1.00

The future stock price prediction can be done using;

- Regression
- None of the given option is valid
- Classification
- Clustering

The correct answer is:
Regression

Question **15**

Complete

Mark 1.00 out of 1.00

Empirical estimate error related to the

- None of the above
- Test error
- Total error
- Training error

The correct answer is:
Training error

Question **16**

Complete

Mark 0.00 out of 1.00

If X is a random variable then the inequality probability $P(X < p)$ (p is an arbitrary constant) requires least number of statistical parameters for

- Chebyshev inequality
- Chernoff inequality
- Markov inequality
- Jenson's inequality

The correct answer is:
Markov inequality

Question **17**

Complete

Mark 0.00 out of 1.00

With the information given in Table 1, predict the species category of the new object having Sepal_length =6.9 and Petal_length=3.5 using KNN algorithm, where K=5.

Table 1: Iris dataset description

SL No.	**Sepal_length**	**Petal_length**	**Species**
1	5.1	1.4	setosa
2	4.9	1.4	setosa
3	4.7	4.7	versicolor
4	6.4	4.5	versicolor
5	6.9	4.9	versicolor
6	5.7	5.1	virginica
7	5.8	5.1	virginica
8	6.4	5.3	virginica

- virginica
- setosa
- versicolor
- None of the given option is valid

The correct answer is:
virginica

Question **18**

Complete

Mark 1.00 out of 1.00

With the information given in Table 1, predict the species category of the new object having Sepal_length =5.3 and Petal_length=2.4 using KNN algorithm, where K=3.

Table 1: Iris dataset description

SL No.	**Sepal_length**	**Petal_length**	**Species**
1	5.1	1.4	setosa
2	4.9	1.4	setosa
3	4.7	4.7	versicolor
4	6.4	4.5	versicolor
5	6.9	4.9	versicolor
6	5.7	5.1	virginica
7	5.8	5.1	virginica
8	6.4	5.3	virginica

- None of the given option is valid
- setosa
- virginica
- versicolor

The correct answer is:
setosa

Question **19**

Complete

Mark 1.00 out of 1.00

With the information given in Table 1, predict the species category of the new object having Sepal_length =6.9 and Petal_length=3.5 using KNN algorithm, where K=1.

Table 1: Iris dataset description

SL No.	Sepal_length	Petal_length	Species
1	5.1	1.4	setosa
2	4.9	1.4	setosa
3	4.7	4.7	versicolor
4	6.4	4.5	versicolor
5	6.9	4.9	versicolor
6	5.7	5.1	virginica
7	5.8	5.1	virginica
8	6.4	5.3	virginica

- None of the given option is valid
- versicolor
- virginica
- setosa

The correct answer is:
versicolor

Question **20**

Complete

Mark 1.00 out of 1.00

The price of the house varies due to several parameters, including- location, area, connectivity, and others. You have assigned a task to build a model which can take the input as the values of the mentioned parameters and predict the tentative price of the house. Which of the following technique will be a best choice to predict the house price using the given parameters?

- Classification
- Clustering
- Regression
- All are correct

The correct answer is:
Regression

Question **21**

Complete

Mark 1.00 out of 1.00

Suppose the tweets collected from Twitter are of two categories (i) Political (ii) Non-political. If you have to perform the classification task, which of the following action is not required. Choose the best suitable answer from the given options.

- Classification
- Cleaning
- Clustering
- Stemming

The correct answer is:
Clustering

Question **22**

Not answered

Marked out of 1.00

From the given data, apply naïve bayes classification technique and predict the probability of P(N|Today), where Today={Sunny, high}. **Note: choose the best suitable value from the given option with exclusion of dinominator part of the bayes equation.**

Outlook	Humidity	Class
Sunny	High	N
Sunny	High	N
Overcast	High	P
Rain	High	P
Rain	Normal	P
Rain	Normal	N
Overcast	Normal	P
Sunny	High	N
Sunny	Normal	P

- 0.25
- 0.025
- 0.444
- 0.044

The correct answer is:
0.25

Question **23**

Complete

Mark 1.00 out of 1.00

Which one is the true statement

- Higher learning rate increases the total number of iterations
- Number of iterations for weight updation is independent from learning rate.
- Higher learning rate can give better results as compare to lower learning rate.
- Lower learning rate can give better results as compare to higher learning rate.

The correct answer is:
Lower learning rate can give better results as compare to higher learning rate.

Question **24**

Complete

Mark 1.00 out of 1.00

Which one represents the true scenario, regarding underfit, overfit and bestfit for any classifier in terms of training error (TE) and test error (TTE).

- $\text{Bestfit}\sim(\text{TE}=11\%, \text{TTE}=41\%), \text{Overfit}\sim(\text{TE}=28\%, \text{TTE}=6\%), \text{Underfit}\sim(\text{TE}=0\%, \text{TTE}=1\%)$
- $\text{Underfit}\sim(\text{TE}=28\%, \text{TTE}=19\%), \text{Bestfit}\sim(\text{TE}=8\%, \text{TTE}=27\%), \text{Overfit}\sim(\text{TE}=2\%, \text{TTE}=31\%)$
- $\text{Underfit}\sim(\text{TE}=28\%, \text{TTE}=1\%), \text{Overfit}\sim(\text{TE}=2\%, \text{TTE}=6\%), \text{Bestfit}\sim(\text{TE}=41\%, \text{TTE}=9\%)$
- $\text{Overfit}\sim(\text{TE}=5\%, \text{TTE}=29\%), \text{Underfit}\sim(\text{TE}=28\%, \text{TTE}=19\%), \text{Bestfit}\sim(\text{TE}=8\%, \text{TTE}=10\%)$

The correct answer is:
$\text{Overfit}\sim(\text{TE}=5\%, \text{TTE}=29\%), \text{Underfit}\sim(\text{TE}=28\%, \text{TTE}=19\%), \text{Bestfit}\sim(\text{TE}=8\%, \text{TTE}=10\%)$

Question **25**

Complete

Mark 1.00 out of 1.00

Which of the following algorithms is not an example of ensemble learning?

A) Random Forest

B) Adaboost

C) Gradient Boosting

D) Decision Trees

- C
- B
- A
- D

The correct answer is:
D

Question **26**

Complete

Mark 1.00 out of 1.00

With the information given in Table 1, predict the species category of the new object having Sepal_length =5.3 and Petal_length=2.4 using KNN algorithm, where K=7.

Table 1: Iris dataset description

SL No.	Sepal_length	Petal_length	Species
1	5.1	1.4	setosa
2	4.9	1.4	setosa
3	4.7	4.7	versicolor
4	6.4	4.5	versicolor
5	6.9	4.9	versicolor
6	5.7	5.1	virginica
7	5.8	5.1	virginica
8	6.4	5.3	virginica

- virginica
- versicolor
- None of the given option is valid
- setosa

The correct answer is:
versicolor

Question **27**

Complete

Mark 1.00 out of 1.00

Let Y is a random variable then which one is true in the context moment generating function $M_Y(k)$

- $\frac{d^n M_Y(k)}{dk^n}|_{k=2} = \mathbf{E}[Y^n]$
- $\frac{d^n M_Y(k)}{dk^n}|_{t=0} = \mathbf{E}[X^n]$
- $\frac{d^n M_Y(k)}{dk^n}|_{k\to\infty} = \mathbf{E}[X^n]$
- $\frac{d^n M_Y(k)}{dk^n}|_{k=0} = \mathbf{E}[Y^n]$

The correct answer is:

$\frac{d^n M_Y(k)}{dk^n}|_{k=0} = \mathbf{E}[Y^n]$

Question **28**

Complete

Mark 1.00 out of 1.00

With the information given in Table 1, predict the species category of the new object having Sepal_length =6.9 and Petal_length=3.5 using KNN algorithm, where K=3.

Table 1: Iris dataset description

SL No.	Sepal_length	Petal_length	Species
1	5.1	1.4	setosa
2	4.9	1.4	setosa
3	4.7	4.7	versicolor
4	6.4	4.5	versicolor
5	6.9	4.9	versicolor
6	5.7	5.1	virginica
7	5.8	5.1	virginica
8	6.4	5.3	virginica

- None of the given option is valid
- virginica
- setosa
- versicolor

The correct answer is:
versicolor

Question **29**

Complete

Mark 0.00 out of 1.00

Which of the following is true regarding the back-propagation in neural network architecture.

- It is a feedback neural network.
- Hidden layer just support the input and output
- Hidden layer cannot be the part of any neural network
- It is combination of feedforward and feedback network.

The correct answer is:
It is combination of feedforward and feedback network.

Question **30**

Complete

Mark 1.00 out of 1.00

With the information given in Table 1, predict the species category of the new object having Sepal_length =5.3 and Petal_length=2.4 using KNN algorithm, where K=1.

Table 1: Iris dataset description

SL No.	**Sepal_length**	**Petal_length**	**Species**
1	5.1	1.4	setosa
2	4.9	1.4	setosa
3	4.7	4.7	versicolor
4	6.4	4.5	versicolor
5	6.9	4.9	versicolor
6	5.7	5.1	virginica
7	5.8	5.1	virginica
8	6.4	5.3	virginica

- setosa
- None of the given option is valid
- virginica
- versicolor

The correct answer is:
setosa

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