1) Among the following identify the one in which dimensionality reduction reduces.

    a) Performance
    b) statistics
    c) Entropy
    d) **Collinearity**

Collinearity is a situation where some features are highly correlated with each other, which can cause problems for some models such as linear regression. By reducing the number of features, dimensionality reduction can help to remove or reduce the collinearity among them, which can improve the accuracy and stability of the model. Therefore, the answer is (d) Collinearity.

2) Which of the following machine learning algorithm is based upon the idea of bagging? a)

Decision Tree

b) **Random Forest**

c) Classfication

d) SVM

3) Choose a disadvantage of decision trees among the following. a)

Decision tree robust to outliers

b) Factor analysis

c) **Decision Tree are prone to overfit**

d) all of the above

4) What is the term known as on which the machine learning algorithms build a model based on sample data?

    a) Data Training
    b) Sample Data
    c) **Training data**
    d) None of the above

5) Which of the following machine learning techniques helps in detecting the outliers in data?

    a) Clustering

    b) Classification
    c) **Anamoly detection**
    d) All of the above

6) Identify the incorrect numerical functions in the various function representation of machine learning.

    a) **Support Vector**
    b) Regression
    c) Case based
    d) Classification

Support Vector. Support vector is a term used to describe a subset of data points that define a hyperplane in support vector machines, which are a type of machine learning algorithm for classification and regression. Therefore, the answer is (a) Support Vector.

7) Analysis of ML algorithm needs

    a) Statistical learning theory
    b) Computational learning theory
    c) None of the above
    d) **Both a and b**

Both statistical learning theory and computational learning theory are important for understanding the theoretical foundations of machine learning and analyzing the properties and limitations of different learning algorithms.

Therefore, the answer is (d) Both a and b.

8) Identify the difficulties with the k-nearest neighbor algorithm.

    a) Curse of dimensionality
    b) Calculate the distance of test case for all training cases
    c) **Both a and b**
    d) None

9) The total types of the layer in radial basis function neural networks is _____

    a) 1

    b) 2
    c) **3**
    d) 4

The radial basis function neural networks are a special class of feed-forward neural networks consisting of **three layers**: an input layer, a hidden layer, and the output layer. The input layer receives input data and passes it into the hidden layer, where the computation occurs. The hidden layer uses radial basis functions as activation functions, which depend only on the distance from a center vector. The output layer is designated for prediction tasks like classification or regression.

Therefore, the answer is © 3.

10) Which of the following is not a supervised learning

    a) **PCA**
    b) Naïve bayes
    c) Linear regression
    d) KMeans

11) What is unsupervised learning?

a) Number of groups may be known

b) Features of groups explicitly stated

c) **Neither feature nor number of groups is known**

d) None of the above

Among the given options, the one that best describes unsupervised learning is © Neither feature nor number of groups is known. In unsupervised learning, the model does not have any prior information about the features or the number of groups in the data, and it has to discover them by itself. Therefore, the answer is © Neither feature nor number of groups is known.

12) Which of the following is not a machine learning algorithm?

a) SVM

b) **SVG**

c) Random Forest Algorithm

d) None of the above

13) _____ is the scenario when the model fails to decipher the underlying trend in the input data

    a) Overfitting

    b) **Underfitting**
    c) Both a and b
    d) None of the above

14) Real-Time decisions, Game AI, Learning Tasks, Skill acquisition, and Robot Navigation are applications of ....

a) **Reinforcement learning**

b) Supervised learning

c) Unsupervised Learning

d) None of the above

15) What is called the average squared difference between classifier predicted output and actual output?
55) What is called the average squared difference between 55classifier

    a) Mean relative error
    b) **Mean squared error**
    c) Mean absolute error
    d) Root mean squared error

16)   Logistic regression is a .... regression technique that is used to model data having a .... outcome.

    a) **Linear, binary**
    b) Linear, numeric
    c) Nonlinear, binary
    d) Nonlinear, numeric

17)   You are given reviews of few netflix series marked as positive, negative and neutral. Classifying reviews of a new netflix series is an example of

A. **supervised learning**

B. unsupervised learning

C. semisupervised learning

D. reinforcement learning

18) Following is powerful distance metrics used by Geometric model

A. euclidean distance

B. manhattan distance

C. both a and b

D. **square distance**

19) Which of the following techniques would perform better for reducing dimensions of a data set?

A. removing columns which have too many missing values

B. removing columns which have high variance in data

C. removing columns with dissimilar data trends

D. **none of these**

20) Supervised learning and unsupervised clustering both require which is correct according to the statement.

A. output attribute.

B. hidden attribute.
C. **input attribute.**
D. categorical attribute

21) What is the meaning of hard margin in SVM?

(A) **SVM allows very low error in classification**

(B) SVM allows high amount of error in classification

(C) Underfitting

(D) SVM is highly flexible

22) Increase in which of the following hyper parameter results into overfit in Random forest? (1). Number of Trees. (2). Depth of Tree, (3). Learning Rate

(A) Only 1

(B) Only 2

(C) **2 and 3**

(D) 1,2 and 3

23) Below are the 8 actual values of target variable in the train file: [0,0,0, 0, 1, 1,1,1,1,1], What is the entropy of the target variable?

(A) **-(6/10 log(6/10) + 4/10 log(4/10))**

(B) 6/10 log(6/10) + 4/10 log(4/10)

(C) 4/10 log(6/10) + 6/10 log(4/10)

(D) 6/10 log(4/10) – 4/10 log(6/10)

24) Lasso can be interpreted as least-squares linear regression where

(A) **weights are regularized with the l1 norm**

(B) weights are regularized with the l2 norm

(C) the solution algorithm is simpler

25) Consider the problem of binary classification. Assume I trained a model on a linearly separable training set, and now I have a new labeled data point that the model properly categorized and is far away from the decision border. In which instances is the learnt decision boundary likely to change if I now add this additional point to my previous training set and re-train? When the training model is,

(A) Perceptron and logistic regression

(B) Logistic regression and Gaussian discriminant analysis

(C) **Support vector machine**

(D) Perceptron

26) Assume you've discovered multi-collinear features. Which of the following actions do you intend to take next? (1). Both collinear variables should be removed. (2). Instead of deleting both variables, we can simply delete one. (3). Removing correlated variables may result in information loss. We may utilize penalized regression models such as ridge or lasso regression to keep such variables.

(A) Only 1

(B) Only 2

(C) Either 1 or 3

(D) **Either 2 or 3**

  The answer is **(D)**: either removing one of the collinear variables or using a penalized regression model can be a valid action to take next, depending on the situation and preference.

27) A least squares regression study of weight (y) and height (x) yielded the following least squares line: y = 120 + 5x. This means that if the height is increased by one inch, the weight should increase by what amount?

(A) increase by 1 pound

(B) **increase by 5 pound**

(C) increase by 125 pound

(D) None of the above

 In this question, the least squares regression line is given by y = 120 + 5x, where y is the weight in pounds and x is the height in inches. The slope of this line is 5, which means that for every one-inch increase in height, the weight should increase by 5 pounds on average. Therefore, **the answer is (B)**: increase by 5 pounds.

28) The line described by the linear regression equation (OLS) attempts to _____?

(A) **Pass through as many points as possible.**

(B) Pass through as few points as possible

(C) Minimize the number of points it touches

(D) Minimize the squared distance from the points

29) For two real-valued attributes, the correlation coefficient is 0.85. What does this value indicate?

(A) The attributes are not linearly related

(B) **As the value of one attribute increases the value of the second attribute also increases**

(C) As the value of one attribute decreases the value of the second attribute increases (D) The

attributes show a curvilinear relationship

In this question, the correlation coefficient is 0.85, which is close to 1. This indicates a strong positive correlation between the two variables, meaning that they tend to increase or decrease together in a linear fashion. Therefore, **the answer is (B)**: as the value of one attribute increases, the value of the second attribute also increases.

30) Which neural network architecture would be most suited to handle an image identification problem (recognizing a dog in a photo)?

(A) Multi Layer Perceptron

(B) **Convolutional Neural Network**

(C) Recurrent Neural network

(D) Perceptron

Convolutional Neural Networks are the most suited neural network architecture for image identification problems because they can effectively capture the spatial features and patterns of the images and perform accurate classification or recognition tasks.