

Examination (January - 2024)
Semester-II

Certificate/Diploma Programme in Artificial Intelligence and Data Science

Machine Learning

Time Allowed: 2 Hours

Max. Marks: 70

Instructions for the Students

1. The question paper shall consist of 70 Multiple Choice questions.
2. All questions are compulsory. Each question carries 1 mark.
3. There will be no negative marking.

<p>Q1. Among the following option identify the one which is not a type of learning.</p> <p>a) Supervised b) Unsupervised c) Reinforcement d) Semi-unsupervised</p>	<p>Q2. Identify the kind of learning algorithm for “facial identities for facial expressions”.</p> <p>a) Prediction b) Recognition Patterns c) Recognize anomalies d) Generating Patterns</p>
<p>Q3. Identify the type of learning in which labelled training data is used.</p> <p>a) Supervised b) Unsupervised c) Reinforcement d) Semi-unsupervised</p>	<p>Q4. Machine learning is a subset of which of the following.</p> <p>a) Artificial Intelligence b) Deep Learning c) Data Learning d) None of the above</p>
<p>Q5. Which of the following machine learning techniques helps in detecting the outliers in data?</p> <p>a) Classification b) Clustering c) Anomaly detection d) All of the above</p>	<p>Q6. The father of machine learning is _____</p> <p>a) Geoffrey Everest Hinton b) Geoffrey Hill c) Geoffrey Chaucer d) None of the above</p>
<p>Q7. Which of the following are common classes of problems in machine learning?</p> <p>a) Regression b) Clustering c) Classification d) All of the above</p>	<p>Q8. Among the following options identify the one which is false regarding regression.</p> <p>a) It is used for the prediction b) It is used for the interpretation c) It relates inputs to outputs d) It discovers casual relationships</p>
<p>Q9. Identify the successful applications of ML.</p> <p>a) Learning to identify human face b) Learning to classify patterns c) Learning to disease diagnosis d) All of the above</p>	<p>Q10. Identify the incorrect numerical functions in the various function representation of machine learning.</p> <p>a) Case-based b) SVMs c) Linear Regression d) Neural Networks</p>
<p>Q11. Choose whether the following statement is true or false: The backpropagation law is also known as the generalized Delta rule.</p> <p>a) True</p>	<p>Q12. Choose the general limitations of the backpropagation rule among the following.</p> <p>a) Slow convergence b) Scaling</p>

b) False	c) Local Minimum Problem d) All of the above
Q13. Analysis of ML algorithm needs a) Statistical learning theory b) computational learning theory c) Both A and B d) None of the above	Q14. Choose the most widely used mattress and tools to assess the classification models. a) Area under ROC Curve b) Confusion Matrix c) Cost-sensitive Accuracy d) All of the above
Q15. Choose that following statement is true or false: True error is defined over the entire instance space, and not just over training data a) True b) False	Q16. The total types of the layer in radial basis function neural networks is _____ a)1 b)2 c)3 d)4
Q17. Choose whether the following statement is true or false: Artificial intelligence is the process that allows a computer to learn and make decisions like humans. a) True b) False	Q18. Choose whether true or false: Decision tree cannot be used for clustering a) True b) False
Q19. Identify the clustering method which takes care of variance in data a) Decision Tree b) Gaussian Mixture Model c) K means d) All of the above	Q20. Which of the following is not machine learning? a) Artificial Intelligence b) Rule-based inference c) Both a and b d) None of the above
Q21. The problem of finding hidden structure in unlabelled data is called _____ a) unsupervised learning b) reinforcement learning c) supervised learning d) None of the above	Q22. For a classification task, instead of random weight initializations in a neural network, we set all the weights to zero. Which of the following statements is true? (a) There will not be any problem and the neural network will train properly (b) The neural network will train but all the neurons will end up recognizing the same thing (c) The neural network will not train as there is no net gradient change (d) None of these
Q23. 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) Under fitting (d) SVM is highly flexible	Q24. In the k-Means Algorithm, which of the following alternatives can be utilized to get global minima? (1). Experiment with different centroid initialization algorithms (2). Change the number of iterations (3). Determine the appropriate number of clusters. (a) 2 and 3 (b) 1 and 3 (c) 1 and 2 (d) All of above
Q 25. In neural how can connections between different layers be achieved? a) Interlayer b) Intralayer c) Both Interlayer and Intralayer d) none of the mentioned	Q26. In ADALINE model what is the relation between output & activation value(x)? a) linear b) nonlinear c) can be either linear or non-linear d) none of the mentioned
Q27. The k-means algorithm is a a) Supervised learning algorithm b) Unsupervised learning algorithm	Q28. Which of the following options is true about the kNN algorithm? a) It can be used only for classification

<p>c) Semi-supervised learning algorithm d) Weakly supervised learning algorithm</p>	<p>b) It can be used only for regression c) It can be used for both classification and regression d) It is not possible to use for both classification and regression</p>
<p>Q29. How can hierarchical clustering be used for dimensionality reduction? a)By applying the clustering algorithm to the features instead of the data points b)By applying the clustering algorithm to the data points and using the cluster centroids as a reduced feature space c)By applying the clustering algorithm to the data points and using the cluster labels as a reduced feature space d)By applying the clustering algorithm to the data points and using the dendrogram to guide the selection of a reduced feature space</p>	<p>Q30. Hierarchical clustering should be primarily used for exploration. a) True b) False</p>
<p>Q31. What is hebb's rule of learning? a) the system learns from its past mistakes b)the system recalls previous reference inputs & respective ideal outputs c)the strength of neural connection get modified accordingly d) none of the mentioned</p>	<p>Q32. _____ in terms of SVM means that an SVM is inflexible in classification a) Hard Margin b) Soft Margin c) Linear Margin d) Non-linear Classifier</p>
<p>Q33. What is delta (error) in perceptron model of neuron? a) error due to environmental condition b) difference between desired & target output c) can be both due to difference in target output or environmental condition d) none of the mentioned</p>	<p>Q34. ART is made to tackle a) stability problem b) hard problems c) storage problems d) none of the mentioned</p>
<p>Q35. Which rule is followed by the Backpropagation algorithm? a)Static Rule b)Dynamic Rule c)Chain Rule d)None</p>	<p>Q36. Time complexity in Backpropagation algorithm is dependent upon _____? a) Networks Structure b) Networks Gradient c) Network Loss d) Network Channel</p>
<p>Q37. Convergence refers to equilibrium behaviour of activation state? a) yes b) no</p>	<p>Q38. ART1 is capable of clustering binary input values a)True b)False</p>
<p>Q39. Which of the following is not a machine learning algorithm? a) SVM b) SVG c) Random forest d) none of the mentioned</p>	<p>Q40. Data pre-processing includes a) Importing the libraries b) Checking missing data c) Importing the dataset d) All of the above</p>
<p>Q41. SOM stands for a) Self-Operating map b) Self-Organization map c) Self-Optimization method</p>	<p>Q42. Logistic Regression transforms the output probability to be in a range of [0, 1]. Which of the following function is used by logistic regression to convert the probability in the range between [0,1].</p>

d) Self-Optimization map.	a) Sigmoid b) Mode c) Square d) All of the above
Q43. Which one of the statement is true regarding residuals in regression analysis? a) Mean of residuals is always zero b) Mean of residuals is always less than zero c) Mean of residuals is always greater than zero d) There is no such rule for residuals.	Q44. The correlation coefficient is used to determine a) A specific value of the y-variable given a specific value of the x-variable b) A specific value of the x-variable given a specific value of the y-variable c) The strength of the relationship between the x and y variables d) All of the above
Q 45. If your data grows in a non-linear fashion. Which model won't perform well? a) Polynomial regression b) Random forest regression c) Simple linear regression d) None	Q 46. What is a support vector? a) The average distance between all the data points b) The distance between any two data points c) The distance between two boundary data points d) The minimum distance between any two data point
Q 47. Suppose you have to predict the salary of employees from their experience. This is a _____ a) Classification task b) Regression task c) Clustering task d) None	Q 48. Which of the following is a popular algorithm for constructing decision trees? a) ID3 b) k-Nearest Neighbors c) Support Vector Machines d) Naive Bayes
Q49. The primary purpose of the Random Forest algorithm is a) To optimize the parameters of a single decision tree b) To handle missing data in decision trees c) To visualize the decision boundaries of a decision tree d) To combine multiple decision trees to improve prediction performance	Q 50. What is a common technique used to reduce the variance of a decision tree? a) Pruning b) Bagging c) Boosting d) Both b and c
Q51. What does vigilance parameter in ART determines? a) number of possible outputs b) number of desired outputs c) number of acceptable inputs d) none of the mentioned	Q52. The primary advantage of using decision trees in machine learning a) Computationally inexpensive b) Easy to interpret and visualize c) Handle missing data d) High predictive accuracy
Q53. How many neurons are in hidden layers of a Four-layer Neural network? a) Four b) Three c) Two d) One	Q54. Why is the XOR problem exceptionally interesting to neural network researchers? a) Because it can be expressed in a way that allows you to use a neural network b) Because it is complex binary operation that cannot be solved using neural networks c) Because it can be solved by a single layer perceptron d) Because it is the simplest linearly inseparable problem that exists.
Q55. Neural Networks are complex _____ with many parameters.	Q56. In terms of bias and variance. Which of the following is true when you fit degree 2 polynomial?

<p>a) Linear Functions b) Nonlinear Functions c) Discrete Functions d) Exponential Functions</p>	<p>a) bias will be high, variance will be high b) bias will be low, variance will be high c) bias will be high, variance will be low d) bias will be low, variance will be low</p>
<p>Q57. Problem in multi regression is a) multicollinearity b) overfitting c) both multicollinearity & overfitting d) underfitting</p>	<p>Q58. Concept of “open to new learning without discarding the previous or the old information” is called as a) Supervised learning b) Perceptron c) ART d) none of the mentioned</p>
<p>Q59. What is gini index? a) it is a type of index structure b) it is a measure of purity c) both options except none d) none of the options</p>	<p>Q60. How to handle the missing values in the dataset? a) Dropping the missing rows or columns b) Imputation with mean/median/mode value c) Taking missing values into a new row or column d) All of the above</p>
<p>Q61. A perceptron can be defined as _____ a) A double layer auto-associative neural network b) A neural network with feedback c) An auto-associative neural network d) A single layer feed-forward neural network with pre-processing</p>	<p>Q62. Having multiple perceptrons can solve the XOR problem satisfactorily because each perceptron can partition off a linear part of the space itself, and they can then combine their results. a) True - This works always, and these multiple perceptrons learn to classify even complex problems. b) False - Perceptrons are mathematically incapable of solving linearly inseparable functions, no matter what you do c) True - Perceptron can do this but are unable to learn to do it - they have to be explicitly hand-coded d) False - Just having a single perceptron is enough</p>
<p>Q63. ARTs can be classified as: a) ART1 b) Fuzzy ART c) FARTMAP d) All of the above</p>	<p>Q64. Each connection link in ANN is linked with _____ that contains statics about the input signal. a) Neurons b) Activation function c) Weights d) Bias</p>
<p>Q65. What is adaline in neural networks? a) Adaptive linear element b) automatic linear element c) adaptive line element d) none of the mentioned</p>	<p>Q66. What is the objective of feature maps? a) to capture the features in space of input patterns b) to capture just the input patterns c) update weights d) to capture output patterns</p>
<p>Q67. Automated vehicle is an application of _____ a) Unsupervised learning b) Supervised learning c) Reinforcement learning d) Active learning</p>	<p>Q68. When two classes can be separated by a separate line, they are known as a) linearly separable b) linearly inseparable classes c) may be separable or inseparable, it depends on system d) none of the mentioned</p>
<p>Q69. The characteristic of a good dataset is a) Sufficiently large for getting meaningful predictions b) The bias is lower c) Both a and b d) None</p>	<p>Q70. The purpose of feature scaling is to a) Accelerating the training time b) Getting better accuracy c) Both a and b d) None</p>