QUESTION BANK

Course Name	:	Machine Learning
Corse Code	:	CS603C
Regulation	:	R21

Group-A
(Multiple Choice Questions)

Question No.			Questions	Marks	Module No.	CO No.	BT Level
1.			Application of machine learning methods to large databases is called A. data mining. B. artificial intelligence C. big data computing D. internet of things	1	M1	CO4	BT5
2.			If machine learning model output involves target variable then that model is called as A. descriptive model B. predictive model C. reinforcement learning D. all of the above	1	M1	CO2	BT4
3.			In what type of learning labelled training data is used A. unsupervised learning B. supervised learning C. reinforcement learning D. active learning	1	M1	CO1	B2
4.			In following type of feature selection method we start with empty feature set A. forward feature selection B. backward feature selection C. both A and B D. none of the above	1	M3	CO2	BT2
5.			SVM can be used to solve _____ problems A. Classification B. Regression C. Clustering D. Both Classification and Regression	1	M1	CO3	BT3

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6.			Which of the following is a disadvantage of decision tree? A. Factor Analysis B. Decision Trees are robust to outliners C. Decision Trees are prone to overfit D. None of the above	1	M3	CO3	BT4
7.			Which of the following is the best machine learning method? A. scalable B. accuracy C. fast D. all of the above	1	M2	CO3	BT3
8.			What characterize unlabeled examples in machine learning? A. there is no prior knowledge B. there is no confusing knowledge C. there is prior knowledge D. there is plenty of confusing knowledge	1	M1	CO1	BT2
9.			What does dimensionality reduction reduce? A. stochastics B. collinerity C. performance D. entropyne	1	M2	CO2	BT1
10.			Data used to build a data mining model. A. training data B. validation data C. test data D. hidden data	1	M2	CO3	BT3
11.			The problem of finding hidden structure in unlabeled data is called… A. supervised learning B. unsupervised learning C. reinforcement learning D. none of the above	1	M1	CO1	BT3
12.			Of the Following Examples, Which would you address using an supervised learning Algorithm? A. given email labeled as spam or not spam, learn a spam filter. B. given a set of news articles found on	1	M1	CO3	BT5

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			the web, group them into set of articles about the same story. C. given a database of customer data, automatically discover market segments and group customers into different market segments. D. find the patterns in market basket analysis.				
13.			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	1	M1	CO4	BT5
14.			Which of the following is a good test dataset characteristic? A. large enough to yield meaningful results B. is representative of the dataset as a whole C. both A and B D. None of the above	1	M2	CO3	BT3
15.			Following are the types of supervised learning A. classification B. regression C. subgroup discovery D. all of the above	1	M1	CO3	BT2
16.			Type of matrix decomposition model is A. descriptive model B. predictive model C. logical model D. none of the above	1	M2	CO2	BT2
17.			The output of training process in machine learning is A. machine learning model B. machine learning algorithm C. null D. accuracy	1	M1	CO4	BT4
18.			A feature F1 can take certain value: A, B, C,	1	M3	CO3	BT4

			D, E, & F and represents grade of students from a college. Here feature type is A. nominal B. ordinal C. categorical D. Boolean				
19.			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	1	M1	CO3	BT3
20.			What characterize is hyper plane in geometrical model of machine learning? A. a plane with 1 dimensional fewer than number of input attributes. B. a plane with 2 dimensional fewer than number of input attributes. C. a plane with 1 dimensional more than number of input attributes. D. a plane with 2 dimensional more than number of input attributes.	1	M6	CO3	BT4
21.			K-Nearest Neighbors (KNN) is classified as what type of machine learning algorithm? a) Instance-based learning b) Parametric learning c) Non-parametric learning d) Model-based learning	1	M3	CO1	BT2
22.			Which of the following is not a supervised machine learning algorithm? a) K-means b) Naïve Bayes c) SVM for classification problems d) Decision tree	1	M3	CO1	BT2
23.			What's the key benefit of using deep learning for tasks like recognizing images? a) They need less training data than other methods. b) They're easier to explain and understand than other models.	1	M6	CO4	BT5

			c) They can learn complex details from the data on their own. d) They work faster and are more efficient computationally.				
24.			Which algorithm is best suited for a binary classification problem? a) K-nearest Neighbors b) Decision Trees c) Random Forest d) Linear Regression	1	M3	CO2	BT3
25.			Which of the following statements is true about AdaBoost? a) It is particularly prone to overfitting on noisy datasets b) Complexity of the weak learner is important in AdaBoost c) It is generally more prone to overfitting d) It improves classification accuracy	1	M6	CO1	BT2
26.			Which one of the following models is a generative model used in machine learning? a) Support vector machines b) Naïve Bayes c) Logistic Regression d) Linear Regression	1	M5	CO2	BT3
27.			An artificially intelligent car decreases its speed based on its distance from the car in front of it. Which algorithm is used? a) Naïve-Bayes b) Decision Tree c) Linear Regression d) Logistic Regression	1	M6	CO3	BT4
28.			Which of the following statements is false about Ensemble learning? a) It is a supervised learning algorithm b) It is an unsupervised learning algorithm c) More random algorithms can be used to produce a stronger ensemble d) Ensembles can be shown to have more flexibility in the functions they can represent	1	M3	CO2	BT2
29.			Decision tree uses the inductive learning machine learning approach.	1	M1	CO3	BT3

			a) False b) True				
30.			Which of the following statements is not true about boosting? a) It mainly increases the bias and the variance b) It tries to generate complementary base-learners by training the next learner on the mistakes of the previous learners c) It is a technique for solving two-class classification problems d) It uses the mechanism of increasing the weights of misclassified data in preceding classifiers	1	M3	CO2	BT2
31.			In which category does linear regression belong to? a) Neither supervised nor unsupervised learning b) Both supervised and unsupervised learning c) Unsupervised learning d) Supervised learning	1	M1	CO1	BT1
32.			The learner is trying to predict housing prices based on the size of each house. What type of regression is this? a) Multivariate Logistic Regression b) Logistic Regression c) Linear Regression d) Multivariate Linear Regression	1	M1	CO4	BT3
33.			The learner is trying to predict housing prices based on the size of each house. The variable "size" is _____ a) dependent variable b) label set variable c) independent variable d) target variable	1	M1	CO3	BT4
34.			The learner is trying to predict the cost of papaya based on its size. The variable "cost" is _____ a) independent variable b) target Variable c) ranked variable	1	M1	CO2	BT3

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			d) categorical variable				
35.			The independent variable is represented along _____ a) Either X-axis or Y-axis, it doesn't matter b) Y axis c) X axis d) Depends on the dataset	1	M2	CO3	BT3
36.			The learner is trying to predict the price of a house based on the length and width of the house. x1 = length and x2 = width. What is a better hypothesis? a) $h(X) = t_0 + t_1 x_1$ b) $h(X) = t_0 + t_1 x_1 + t_2 x_2$ c) $h(X) = t_0 + t_2 x_2$ d) $h(X) = t_0 + t_1 X$, where area of the house: $X = x_1 * x_2$	1	M1	CO2	BT3
37.			A drawback of Polynomial Regression is handling of features with a different priority. a) True b) False	1	M6	CO2	BT3
38.			$h(x) = y$. What is the cost $(h(x), y)$? a) -infinite b) infinite c) 0 d) always h(x)	1	M2	CO3	BT3
39.			Let m be the number of training instances. What is the summation of cost function multiplied by to get the gradient descent? a) $1/m$ b) m c) $1 + m$ d) $1 - m$	1	M6	CO3	BT2
40.			The cost function is minimized by _____ a) Linear regression b) Polynomial regression c) PAC learning d) Gradient descent	1	M6	CO4	BT4
41.			What is the minimum number of parameters	1	M2	CO1	BT1

			of the gradient descent algorithm? a) 1 b) 2 c) 3 d) 4				
42.			What happens when the learning rate is low? a) It always reaches the minima quickly b) It reaches the minima very slowly c) It overshoots the minima d) Nothing happens	1	M3	CO2	BT3
43.			Gradient descent tries to _____ a) maximize the cost function b) minimize the cost function c) minimize the learning rate d) maximize the learning rate.	1	M2	CO1	BT2
44.			Feature scaling can be used to simplify gradient descent for multivariate linear regression. a) True b) False	1	M2	CO3	BT3
45.			On which factor is the updating of each parameter dependent on? a) The number of training examples b) Target variable c) The learning rate and the target variable d) The learning rate	1	M3	CO2	BT2
46.			What is updated by gradient descent after each iteration? a) The learning rate b) Independent variables c) Target variable d) The number of training examples	1	M2	CO3	BT3
47.			Mean normalization can be used to simplify gradient descent for multivariate linear regression. a) True b) False	1	M2	CO2	BT2
48.			What is the objective of backpropagation algorithm? a) to develop learning algorithm for multilayer	1	M6	CO3	BT2

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Question No.			Questions	Marks	Module No.	CO No.	BT Level
			feed forward neural network				
			b) to develop learning algorithm for single layer feed forward neural network				
			<mark>c) to develop learning algorithm for multilayer feed forward neural network, so that network can be trained to capture the mapping implicitly</mark>				
			d) none of the mentioned				
49.			What are general limitations of back propagation rule? a) local minima problem b) slow convergence c) scaling <mark>d) all of the mentioned</mark>	1	M6	CO4	BT3
50.			There is feedback in final stage of back propagation algorithm? <mark>a) yes</mark> b) no	1	M6	CO1	BT2

* Please don't add any column in the above table. However, you may add rows as per requirement.

Group-B
(Short Answer Type Questions)

Question No.			Questions	Marks	Module No.	CO No.	BT Level
1.			Compare Traditional Programming Model and Machine Learning Model with suitable diagram.	5	M1	CO1	BT1
2.			Consider the confusion matrix: 			Actual Values	
---	---	---	---
		Yes	No
Predicted Values	Yes	12	3
	No	1	9 | Compute algorithm training accuracy.	5	M2	CO1	BT3
3.			Define machine learning. Briefly describe different types of machine learning with	1 + 4	M1	CO2	BT1

			suitable example.				
4.			Compare between machine learning and deep learning.	5	M1	CO1	BT2
5.			Differentiate between supervised and unsupervised learning. What is Reinforcement Learning? Give suitable example.	3 + 2	M1	CO1	BT2
6.			Calculate entropy of a single attribute 'Playing Golf' problem when the following data is given:	5	M1	CO3	BT3
7.			Calculate the Gini Index when the following data is given:	5	M2	CO4	BT3
8.			Explain KNN Algorithm.	5	M2	CO3	BT3
9.		a)	Why do we perform normalization?	2	M2	CO2	BT3
		b)	What is the difference between precision and recall?	3	M1	CO2	BT2
10.			How can you conclude about the model's performance using the confusion matrix?	5	M1	CO3	BT4
11.			What is the difference between L1 and L2 regularization? What is their significance?	2 + 3	M2	CO2	BT2
12.		a)	Does the accuracy score always a good metric to measure the performance of a classification	3	M2	CO4	BT4

Question 6 table:

Playing Golf	
Yes	No
9	5

Question 7 table:

ID	Loan Amount	Loan Status
1	100	Bad
2	200	Good
3	250	Bad
4	150	Good
5	300	Bad

				Marks	Module No.	CO No.	BT Level
			model?				
		b)	What is the purpose of splitting a given dataset into training and validation data?	2	M2	CO2	BT3
13.		a)	What is the difference between k-means and the KNN algorithm?	3	M2	CO2	BT2
		b)	What is Linear Discriminant Analysis?	2	M6	CO1	BT1
14.		a)	What is the null hypothesis in linear regression problem?	3	M6	CO1	BT2
		b)	Can SVMs be used for both classification and regression tasks?	2	M1	CO4	BT4
15.			What are the assumptions behind the K-means algorithm? How do these assumptions affect the results?	2 + 3	M2	CO4	BT5
16.			How does Random Forest ensure diversity among the trees in the model?	5	M3	CO3	BT4
17.			What is the concept of information gain in decision trees? How does it guide the creation of the tree structure?	2 + 3	M1	CO2	BT3
18.			How does the independence assumption affect the accuracy of a Naive Bayes classifier?	5	M5	CO4	BT5
19.			Why does PCA maximize the variance in the data?	5	M2	CO2	BT2
20.			How do you evaluate the effectiveness of a machine learning model in an imbalanced dataset scenario? What metrics would you use instead of accuracy?	3 + 2	M6	CO4	BT5

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Group-C
(Long Answer Type Questions)

Question No.			Questions	Marks	Module No.	CO No.	BT Level
1.		a)	Explain Decision Tree Algorithm.	5	M1	CO3	BT3

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				10	M2	CO 4	BT5
	b)	Apply ID3 algorithm for constructing decision tree for the following Play Tennins.csv dataset					

Day	Outlook	Temp	Humidity	Windy	Play
Day 1	Sunny	Hot	High	False	No
Day 2	Sunny	Hot	High	True	No
Day 3	Overcast	Hot	High	False	Yes
Day 4	Rainy	Mild	High	False	Yes
Day 5	Rainy	Cool	Normal	False	Yes
Day 6	Rainy	Cool	Normal	True	No
Day 7	Overcast	Cool	Normal	True	Yes
Day 8	Sunny	Mild	High	False	No
Day 9	Sunny	Cool	Normal	False	Yes
Day 10	Rainy	Mild	Normal	False	Yes
Day 11	Sunny	Mild	Normal	True	Yes
Day 12	Overcast	Mild	High	True	Yes
Day 13	Overcast	Hot	Normal	False	Yes
Day 14	Rainy	Mild	High	True	No

			Marks	M	CO	BT
2.	a)	Describe Support Vector Machine and Non-Linear Support Vector Machine in detail.	7	M1	CO 1	BT1
	b)	What is Ensemble modeling? Discuss about Bagging, Boosting and Stacking.	8	M2	CO 2	BT2
3.	a)	Compare Entropy and Information Gain in ID3 with an example.	5	M2	CO 3	BT4
	b)	Use K-means algorithm to create two clusters of the following dataset.	10	M2	CO 4	BT5

Data point	Coordinate(x,y)
A	2,2
B	3,2
C	1,1
D	3,1

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			E	1.5,0.5			
4.		a)	What is overfitting and underfiting?	5	M3	CO2	BT1
		b)	Discuss cross validation.	5	M3	CO1	BT2
		c)	Define Sparse Modeling.	5	M4	CO2	BT3
5.		a)	Explain Support Vector Machine (SVM).	5	M1	CO2	BT2
		b)	Explain non linear SVM and kernel function.	5	M1	CO2	BT3
		c)	Explain polynomial regression.	5	M6	CO2	BT2
6.			**Write Short Note. (any three)**	3 x 5			
		a)	Naïve Bayes Classification	5	M6	CO2	BT1
		b)	Reinforcement Learning	5	M5	CO1	BT2
		c)	Sparse Modeling	5	M4	CO1	BT3
		d)	Performance metrics to evaluate an ML model	5	M1	CO4	BT5
		e)	Clustering	5	M2	CO3	BT4
7.		a)	Explain the various issues in Decision tree Learning	5	M1	CO2	BT2
		b)	What do you mean by Gradient Descent? What are the conditions in which Gradient Descent is applied?	2 + 3	M3	CO4	BT5
		c)	Differentiate between Gradient Descent and Stochastic Gradient Descent.	5	M3	CO2	BT2
8.		a)	Explain the concept of Bayes theorem with an example.	5	M5	CO4	BT4

	b)	Explain Naïve Bayes Classifier with an Example.	5	M6	CO 2	BT3
	c)	Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can be corrected.	5	M2	CO 4	BT5
9.	a)	Define the following terms with respect to K - Nearest Neighbour Learning: i) Regression ii) Residual iii) Kernel Function.	3 + 3 + 3	M2	CO 1	BT1
	b)	Define the following terms: a. Sample error b. True error c. Random Variable d. Expected value e. Variance f. standard Deviation	6	M4	CO 1	BT1
10.	a)	How is KNN different from k-means clustering?	5	M2	CO 4	BT5
	b)	What is the difference between a generative and discriminative model?	5	M6	CO 2	BT2
	c)	When should you use classification over regression?	5	M3	CO 4	BT5
11.	a)	Explain Logistic Regression. Also, explain its types	8	M2	CO 3	BT2
	b)	Write the assumptions made in simple linear regression. Explain the properties of least-square estimators.	7	M2	CO 3	BT2
12.	a)	Explain the DBSCAN algorithm for density based clustering. List out its advantages compared to K-means	8	M3	CO 3	BT2
	b)	Define clustering. Explain K-means clustering with algorithm and flowchart.	7	M3	CO 3	BT2
13.	a)	What is Data pre-processing? Why is Data Preprocessing important?	5	M1	CO 3	BT2
	b)	What is over fitting? How can you avoid it?	5	M3	CO 3	BT2
	c)	Difference between Bias and Variance?	5	M1	CO 3	BT3
14.	a)	Explain Regression and Classification with an example.	8	M2	CO 3	BT2
	b	What are Linear Regression and Logistic Regression?	7	M2	CO	BT2

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		)	Explain with an example.			4	
15.		a)	What is under fitting in Machine Learning?	2	M1	CO3	BT2
		b)	What is Cross-Validation?	3	M2	CO3	BT2
		c)	Define Confusion Matrix.	4	M1	CO3	BT3
		d)	What is Regularization in Machine Learning?	3	M3	CO2	BT3
		e)	What is Feature Scaling?	3	M3	CO3	BT2

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