BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/SP20)**

CLASS: MCA — **SEMESTER : III**
BRANCH: MCA — **SESSION : MO 22**

SUBJECT: CA511 BASICS OF MACHINE LEARNING

TIME: 03 Hours — **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a) Show relationship between Artificial Intelligence, machine learning and deep learning with the help of diagram. [2] [CO1][BT2]

Q.1(b) Identify "Prediction of house price is a regression/classification problem" Justify your answer. [3] [CO1][BT3]

Q.1(c) Do we need to normalize given data? If yes give justification why normalization is required in given data. Also write result of normalization. [5] [CO2][BT3]

	Age (X1)	Income (X2)
x1	12	300
x2	14	500
x3	18	1000
x4	23	2000
x5	27	3500
x6	28	4000
x7	34	4300
x8	37	6000
x9	39	2500
x10	40	2700

Q.2(a) Two six-sided dice are rolled. What is the probability that the numbers on the dice are different? [2] [CO3][BT5]

Q.2(b) Calculate accuracy, precision, recall, F1 score for given confusion matrix. [CO3][BT3] [3]

n=165	Predicted: NO	Predicted: YES	
Actual: NO	TN = 50	FP = 10	60
Actual: YES	FN = 5	TP = 100	105
	55	110	

Q.2(c) How regularization is done in logistic regression. Give all regularization formulas. [CO2][BT2] **[5]**

Q.3(a) Entropy is less preferred method to calculate information gain in decision tree. Why? [CO3][BT3] [2]

Q.3(b) Consider the following dataset: [3]

x	y
1	1
2	1
4	-1
5	-1
6	-1
7	-1
9	1
10	1

(Note: x is the feature and y is the output)

Which of these is not a support vector when using a Support Vector Classifier with a polynomial kernel with degree = 3, CC = 1, and gamma = 0.1? [CO3][BT3]

PTO

Q.3(c) Explain decision tree with example using Gini index. [CO3][BT2] [5]

Q.4(a) The value of bias and variance for efficient machine learning methods should be……..? Justify your answer. [CO4][BT4] [2]

Q.4(b) Apply Naïve bayes classifier on given data [CO4][BT4] [3]

Document	Text	Class
1	I loved the movie	+
2	I hated the movie	-
3	a great movie. good movie	+
4	poor acting	-
5	great acting. a good movie	+

Q.4(c) Show neural network learning in digit recognition system with the help of figure/flowchart/algorithm. [CO4][BT5] [5]

Q.5(a) Google assistance is an example of natural language generation or understanding or both. Justify your answer. [CO5][BT4] [2]

Q.5(b) Apply k mean clustering on given dataset. And show your steps For K=2 [CO5][BT3] [3]

Obs.	X_1	X_2
1	1	4
2	1	3
3	0	4
4	5	1
5	6	2
6	4	0

Q.5(c) How ensemble are different than traditional machine learning methods. [CO5][BT4] [5]

:::::21/11/2022:::::E