Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - OCT 2023

Semester : Semester VII - 2020

Course Code : ECE3051

Course Name : Sem VII - ECE3051 - Machine Learning and Deep Learning Using Fpga

Program : B. TECH

Date : 31-OCT-2023

Time : 2:00PM - 3:30PM

Max Marks : 60

Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. Based on the truth table of any given digital logic circuit , the Behavioral model in VHDL is developed. Develop the VHDL code for Half Adder using the behavioural IF statement

(CO1) [Knowledge]

2. An opportunity to call multiple times a compiled design and thus reducing the number of lines in code is called structural style of modeling in the VHDL. Develop the VHDL code in structural model for the half subtractor circuit.

(CO1) [Knowledge]

3. The most common machine learning algorithms utilized for the clustering of the data sets in the binary form is SVM. Represent the formula for the Coordinates in the non-linear Support Vector Machine

(CO1) [Knowledge]

4. The artificial intelligence merit is to make the machine perform classification, identification and prediction. Categorize the types of learning in Artificial Intelligence

(CO2) [Knowledge]

5. The field of engineering that incorporates both computer science and dataset to solve real time problems is referred as Artificial Intelligence. Differentiate between Machine Learning and Deep Learning

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(2 X 15 = 30M)**

6. Based on the robability functions, the Naive Bayes algorithm is used to classify and categorize the datasets.Predict the new instance say {Yellow, Sports, Imported} will be stolen or not using the Naïve Bayes Algorithm

Example No.	Color	Type	Origin	Stolen?
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	SUV	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

(CO1) [Comprehension]

7. K-nearest neighbor uses proximity to make classifications or predictions about the grouping of an individual data point**.** Illustrate the K-Nearest Neighbor Algorithm with suitable example

(CO2) [Comprehension]

PART B

ANSWER THE FOLLOWING QUESTION **(1 X 20 = 20M)**

8. The decision tree machine learning algorithm based classification is simple. Develop the decision tree algorithm for the following dataset as given below. Calculate the entropy, information at every iteration of the Decision Tree algorithm.

Day	Outlook	Temp	Humidity	Wind	Play Tennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

(CO2,CO1) [Application]