

2022

COMPUTER SCIENCE

[HONOURS]

(CBCS)

(B.Sc. Fifth Semester End Examination-2022)

PAPER-DSE2T

Full Marks: 40

Time: 02 Hrs

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Group-A

- 1. Answer any five questions of the following: 5x2=10**
- a) Explain the scenarios where unsupervised learning is suitable.
 - b) Explain the applications of numpy and pandas package?
 - c) Explain the difference between classification and Regression.
 - d) What is Overfitting and underfitting? How to Tackle Overfitting and underfitting?
 - e) Differentiate between concept learning as a task and concept learning as a search.
 - f) How are bias and variance addressed in linear regression?
 - g) What is a learning rate in a perceptron network? State its purpose.
 - h) Give an example of sampling and its use.

(2)

Group-B

Answer any four questions of the following: **4x5 = 20**

2. What is back propagation algorithm? Explain how weight are update using back propagation algorithm?
3. What is the purpose of Activation Function? Explain sigmoid function and its application 2+3
4. What is binomial classification and Multinomial classification? Why a single perceptron cannot simulate simple XOR function? Explain 2+3
5. Go to the following table where Attributes are Color, Type, Origin and the subject, stolen can be either yes or no. Now using The Bayes Naive classifier We want to classify a Red Domestic SUV and find whether it will be classified as yes or no.

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

(3)

6. What is decision tree? Explain various issues in the decision tree learning.
7. Describe how principle component analysis is carried out to reduce dimensionality of data sets. 5

Group -C

Answer any one question: **1x10 = 10**

8. What is the slope? What is the y-intercept? In linear regression The sales of a company(in million dollars) for each year are shown in the table below.

x(year)	2005	2006	2007	2008	2009
y (sales)	12	19	29	37	45

- a) Find the least square regression line $y = ax + b$.
 - b) Use the least square regression line as a model to estimate the sales of the company in 2012. 2+1+2+5
9. a) What is gradient descent learning?
 - b) Explain the algorithm of Gradient descent.
 - c) What is bias and variance? Explain the trade off between bias and variance. 2+3+5