

**2021**

**Computer Science**

**[HONOURS]**

**(CBCS)**

**(B.Sc. Fifth Semester End Examination-2021)**

**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**

**Answer any FIVE questions of the following: 5x2=10**

1. How machine learning is different from Traditional learning.
2. Explain the scenarios where unsupervised learning is suitable.
3. Why feature engineering is necessary in machine learning?
4. How Do You Decide Which Machine Learning Algorithm to Use to solve a problem.
5. Differentiate between classification and regression.
6. Calculate the dissimilarity between two data points  $x_1(2,3,4)$  and  $x_2(4,3,5)$  Using Euclidian distance (b) Manhattan Distance.
7. Define reinforcement learning.

(2)

8. What is Overfitting and Underfitting? How to Tackle Overfitting and underfitting.

**Group B**

Answer any FOUR questions of the following: 5x4 = 20

1. What do you mean by feature engineering? Explain different techniques of features extraction and selection. 2+3
2. What are the different methods for measuring classifier performance.
3. With suitable equation, explain any two types of activation functions used in neural network.
4. What is cost functions? Explain cost function mathematically for linear regression 2+3
5. What is binomial classification and Multinomial classification? Why a single perceptron cannot simulate simple XOR function? Explain. 2+2+1
6. What is a Artificial Neural Network? Compare between biological and artificial neuron. 1+2+2

**Group C**

Answer any ONE questions of the following: 10x1 = 10

1. What is the slope? What is the y-intercept In linear regression

(3)

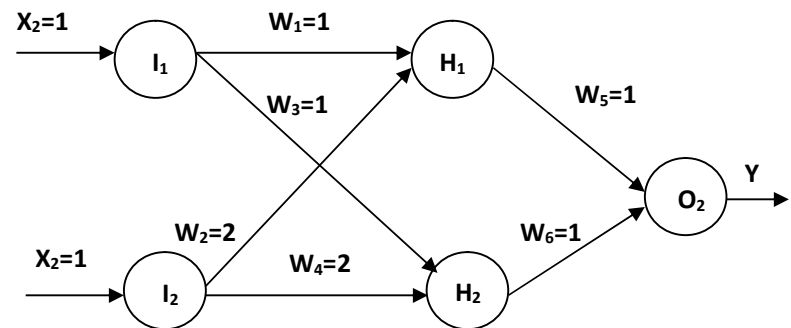
The sales of a company (in million dollars) for each year are shown in the table below.

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 squares regression line as a model to estimate the sales of the company in 2012. 2+1+2+5
2. What is gradient descent learning? Compare between forward and backward propagation.

Consider the following Neural Network with  $\alpha = 0.5$ ,  $\eta=0.24$ , desired output=1 and sigmoid activation function.

- i. Perform one forward pass and calculate the error.
- ii. Calculate the updated weights for  $w_5$  and  $w_6$  using back propagation. 2+2+3+3



Internal assessment - 10