Name: **Enrolment no:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, May 2021

Course: Artificial Neural Network and Applications — **Semester: II**
Program: M.Tech. CSE — **Time: 03 hrs.**
Course Code: CSAI7005 — **Max. Marks: 100**

SECTION A

1. Each Question carries 5 Marks
2. Type answer in TEXTBOX provided. [DO NOT WRITE IN COPIES]

S. No.	Question	CO
Q 1	Discuss how the Perceptron model is different from an MP model?	CO1
Q 2	Describe the features of a biological neuron, which makes it superior to an artificial neuron.	CO1
Q 3	Explain K-Means clustering algorithm in Radial Basis Function (RBF) network.	CO2
Q 4	Define Backpropagation learning for determining linear weights.	CO2
Q 5	Elaborate the Hebb's Postulate and its modeling in ANN.	CO3
Q 6	Differentiate between Training set and Test set.	CO4

SECTION B

1. Each question carries 10 marks
2. Instruction: Write answers in your copies, SCAN AND UPLOAD.

Q 7	Describe McCulloch-Pitts Model for a neuron. Illustrate the significance of Activation function, Ramp function, Gaussian function and Sigmoid function in context to MP model. **OR** Construct a MP-Neuron Model for AND logical relations.	CO1
Q 8	Elaborate Gradient descent algorithm for error minimization. Also differentiate between Batch-based, Mini-Batch and Stochastic Gradient descent algorithms.	CO2
Q 9	Discuss the Back Propagation algorithm and demonstrate the activation functions commonly used in BP Algorithm with the help of suitable example.	CO3
Q 10	Demonstrate that unsupervised learning can be implemented in an on-line or off-line fashion. Also, discuss its physical implications.	CO4
Q 11	Illustrate Local Maxima problem using suitable example. **OR** Demonstrate how over-training of a network can be avoided.	CO4

Section C

1. **Question carries 20 Marks.**
2. **Instruction: Write long answer in your copies, SCAN AND UPLOAD.**

Q 12	a) Construct an auto-associative discrete Hopfield network with input vector (1, 1, -1, -1) b) Test discrete Hopfield network with missing entries in third and fourth component of stored vector **OR** a) Find the least square regression line for the following set of data **{(-1 , 0), (0 , 2), (1 , 4), (2 , 5)}** b) Plot the given points and the regression line in the same rectangular system of axes and Also, conduct the goodness of fit to justify your predictions.	CO2