

JAMIA HAMDARD
Department of Computer Science & Engineering
School of Engineering Sciences & Technology
New Delhi-110062

Even Semester Examination 2023

Course Name: Neural Networks and Deep Learning

Time: 3 Hours

Paper Code: BTCSE-DED33

Maximum Marks: 75

Follow proper numbering for answering the questions.

Q. No.	Questions	Marks	CO	BL															
Section A All questions are compulsory.		7×5=35																	
1	What is soft computing? How it differs from hard computing? Name some soft computing techniques	5	CO1	L2, L4															
2	Find out accuracy, and F1 score for the following. <table><tr><td>Actual →</td><td>Right hand motion</td><td>Left hand motion</td></tr><tr><td>Right hand motion</td><td>[roll_no]</td><td>2 [roll_no]</td></tr><tr><td>Left hand motion</td><td>[roll_no]²</td><td>100 + [roll_no]</td></tr></table>	Actual →	Right hand motion	Left hand motion	Right hand motion	[roll_no]	2 [roll_no]	Left hand motion	[roll_no] ²	100 + [roll_no]	5	CO2	L2, L3						
Actual →	Right hand motion	Left hand motion																	
Right hand motion	[roll_no]	2 [roll_no]																	
Left hand motion	[roll_no] ²	100 + [roll_no]																	
3	What is the limitation of using thresholding activation function in artificial neural network? Give the solution to it.	5	CO1	L4, L5															
4	Can we use a model designed for a specific problem to another problem of other domain? What do we call this learning? Explain with example.	5	CO2	L3, L4															
5	Explain the reasons why Recurrent models are more suitable for Video, Audio and Signal processing based classification problems.	5	CO4	L4															
6	What is unsupervised learning? Differentiate between classification and clustering with the help of suitable example.	5	CO2	L1, L3															
7	Design Neural Network using Perceptron Model to classify the given dataset with suitable weights and bias. <table><tr><td>X1</td><td>X2</td><td>Class</td></tr><tr><td>-2</td><td>-4/3</td><td>A</td></tr><tr><td>12/7</td><td>3</td><td>A</td></tr><tr><td>-3/2</td><td>2</td><td>B</td></tr><tr><td>2</td><td>-2</td><td>B</td></tr></table>	X1	X2	Class	-2	-4/3	A	12/7	3	A	-3/2	2	B	2	-2	B	5	CO3	L3
X1	X2	Class																	
-2	-4/3	A																	
12/7	3	A																	
-3/2	2	B																	
2	-2	B																	

Section B <i>Attempt any Four questions.</i>		4×10=40		
1	Discuss the history of Artificial Intelligence. What is difference between Machine Learning and Deep Learning? Write a code to read CSV, JSON and SQL file in python.	10	CO3	L1, L5
2	What is self-organizing feature map? Consider a Kohonen net with two cluster unit and three input units. The weight vectors for the cluster unit are (0.8, 0.6, 0.5) and (0.4, 0.3, 0.5). Find the winning cluster unit for the input vector (0.4, 0.2, 0.1). Use learning rate of 0.2. Find the new weights for the winning unit.	10	CO2	L3
3	How can you find the changes in weights for hidden layer in back propagation algorithm.	10	CO3	L6
4	Explain the Convolution operation in details used in the CNNs. Highlight the effect of stride on this process using suitable examples.	10	CO4	L1, L3
5	A 2-layer feed-forward neural network consisting of two-input, three hidden and single-output neuron, has the hidden layer weights as $V_j = [0.3, 0.4; 0.2, 0.8; 0.1, 0.6]$ and output layer weights as $W_k = [0.22, 0.47, 0.36]$. The bias values are $b_j = 0.5$ and $b_k = 0.45$. Consider a sigmoidal function with $s=0.2$ as activation function. Determine the output of neural network if the input is, $I = [0.5, 0.2]$ and find the changes in weights using back-propagation algorithm for given target = 0.7 and learning rate of 0.6.	10	CO3	L5
6	Write a short note of the following : i) Application of Deep learning in Safe Driving ii) Application of Computer Vision in COVID-19 Detection	10	CO5	L2, L3

BL-Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3- Applying, 4- Analysing, 5- Evaluating, 6- Creating)