BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MTECH **SEMESTER : II**
BRANCH: AIML **SESSION : SP/2023**

SUBJECT: CS631 DEEP LEARNING

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall. NIL

			CO	BL
Q.1(a)	Write a note on Gradient descent with Momentum and RMS prop. Elaborate on how the ADAM optimization algorithm combines the two together.	[7]	1	4
Q.1(b)	Differentiate between Leaky ReLU and Softplus activation functions.	[3]	1	3
Q.2(a)	Summarize the steps of Principal Component Analysis with the help of an example.	[5]	2	5
Q.2(b)	How is SMOTE technique applied for class imbalance handling? Explain with an example	[5]	2	3
Q.3(a)	Write a note on (i) Local Connectivity in CNN (ii) Effect of Zero Padding	[2.5+2.5]	3	4
Q.3(b)	Perform the computations for convolution operation on the given Input volume and the filter with Stride S=1; Zero padding P=1	[5]	3	3

0	20	0	30
1	51	4	2
32	80	0	75
0	9	0	95

Input volume

$\otimes$

-1	0	1
-2	0	2
-1	0	1

Filter

Q.4(a)	Explain the functioning of a RNN in terms of its unfolded computational graph.	[5]	4	4
Q.4(b)	"Learning long term dependencies is a challenge" – Justify the statement and suggest any one solution to deal with this.	[5]	4	5
Q.5(a)	How does the LSTM solve the vanishing gradient problem? What is the importance of Cell state?	[5]	5	5
Q.5(b)	Explain briefly the application of RNN in building Language models, text generation and natural language processing.	[5]	5	3

:::::18/07/2023:::::