

SET-A

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2024		
(B.Tech) Program: Computer Engineering , Scheme I/II/III: II		
Regular Examination: LY Semester: VIII		
Course Code: CEDLC8024 and Course Name: Deep Learning		
Date of Exam: 16/05/2024	Duration: 02.5 Hours	Max. Marks: 60

Instructions:
 (1) All questions are compulsory.
 (2) Draw neat diagrams wherever applicable.
 (3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Define Reinforcement Learning and give a suitable example.	2	CO1	U
ii)	Describe the working of softmax Activation function.	2	CO2	U
iii)	What is Dataset Augmentation? Why it is used in deep learning?	2	CO3	U
iv)	An input image has been converted into a matrix of size 12 X 12 along with a filter of size 3 X 3 with a Stride of 1. Determine the size of the convoluted matrix.	2	CO4	Ap
v)	What are Attention Networks? What is their importance?	2	CO5	U
vi)	Explain in short how deep learning can be used in Natural Language Processing tasks?	2	CO6	U
vii)	Compare L1 and L2 Regularization	2	CO3	U
viii)	What are Depth wise separable CNN?	2	CO4	U
Q.2	Solve any four questions out of six.	16		
i)	Apply Mc-Culloch Pitts model to simulate the logical AND Gate	4	CO1	Ap
ii)	Explain Mean Absolute Error and Cross Entropy loss.	4	CO2	U
iii)	Explain Stochastic and Mini-Batch Gradient Descent Algorithms	4	CO3	An
iv)	Describe the architecture of LeNet -5.	4	CO4	U

v) Draw and explain encoder-decoder architecture with a suitable example.

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2024		
(B.Tech) Program: Computer Engineering , Scheme I/II/IIB/III: II		
Regular Examination: LY Semester: VIII		
Course Code: CEDLC8024 and Course Name: Deep Learning		
Date of Exam: 16/05/2024	Duration: 02.5 Hours	Max. Marks: 60

Vi)	Explain the architecture of GAN(Generative adversarial network)	4	CO6	U																																													
Q.3	Solve any two questions out of three.	16																																															
i)	What is Linear Separability? Give example and demonstrate the same for implementation of logical OR Gate.	8	CO1	Ap																																													
ii)	<p>Consider the input image (6*6) and Sobel filter(3*3) for Convolution</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>3</td><td>0</td><td>1</td><td>2</td><td>7</td><td>4</td></tr> <tr><td>1</td><td>5</td><td>8</td><td>9</td><td>3</td><td>1</td></tr> <tr><td>2</td><td>7</td><td>2</td><td>5</td><td>1</td><td>3</td></tr> <tr><td>0</td><td>1</td><td>3</td><td>1</td><td>7</td><td>8</td></tr> <tr><td>4</td><td>2</td><td>1</td><td>6</td><td>2</td><td>8</td></tr> <tr><td>2</td><td>4</td><td>5</td><td>2</td><td>3</td><td>9</td></tr> </table> <table style="margin-left: auto; margin-right: auto;"> <tr><td>1</td><td>0</td><td>-1</td></tr> <tr><td>2</td><td>0</td><td>-2</td></tr> <tr><td>1</td><td>0</td><td>-1</td></tr> </table> <p style="text-align: center;">Sobel filter</p> <p>Apply convolution with padding of size 1, and avg pooling with stride = 2 and filter size 2. Finally apply Relu activation function. Show the output at each step with proper calculations.</p>	3	0	1	2	7	4	1	5	8	9	3	1	2	7	2	5	1	3	0	1	3	1	7	8	4	2	1	6	2	8	2	4	5	2	3	9	1	0	-1	2	0	-2	1	0	-1	8	CO4	Ap
3	0	1	2	7	4																																												
1	5	8	9	3	1																																												
2	7	2	5	1	3																																												
0	1	3	1	7	8																																												
4	2	1	6	2	8																																												
2	4	5	2	3	9																																												
1	0	-1																																															
2	0	-2																																															
1	0	-1																																															
iii)	Explain and compare LSTM and GRU architectures.	8	CO5	U																																													
Q.4	Solve any two questions out of three.	16																																															
i)	Implement NAND function with Bipolar inputs and targets using adaline network.(Apply delta rule for weight and bias updations.). Consider initial weights w1, w2, b =1 and learning rate = 0.1. Simulate the network upto 2 Epochs.	8	CO2	Ap																																													
ii)	Explain the mathematical foundation of Adams and Adagrad Optimization Algorithms	8	CO3	U																																													
iii)	<p>You will be given the tasks of object recognition for following objects:</p> <ol style="list-style-type: none"> 1. Medical Images 2. Vehicle Number Plates 3. Objects in a moving environment for autonomous vehicle <p>Suggest and explain suitable deep learning models/architecture to be used with reasons.</p>	8	CO6	An																																													