21 MAY 2022

K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22

(Autonomous College Affiliated to University of Mumbai)

End Semester Exam

April - May 2022

(B.Tech/M.Tech.) Program: B.Tech - COMP

Examination: LY Semester: VIII

Course Code: 1UCEDLC8024 and Course Name: Deep Learning

Duration: 03 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 Deep Learning. Enlist applications of Deep learning in the Healthcare domain.	**2M**	CO1	R
ii)	Differentiate between biological neuron and artificial neuron.	**2M**	CO1	An
iii)	What is Over fitting and Underfitting, and How to Combat Them?	**2M**	CO1	U

iv)	Explain Batch Normalization with reference to Deep Neural Network	**2M**	CO3	U
v)	Why is Depthwise Separable Convolution so efficient?	**2M**	CO4	U
vi)	State difference between RNN and Gated RNN(GRU)	**2M**	CO4	An
vii)	What is the difference between over complete and under complete auto encoders?	**2M**	CO6	An
viii)	Why Convolution neural network.(CNN) is most preferred for the image data?	**2M**	CO4	R,U
Q.2	**Solve any four questions out of six.**	**16**		
i)	Discuss three classes of deep learning.	**4M**	CO1	U
ii)	Draw and explain the architecture of Convolution Neural Network.	**4M**	CO4	U
iii)	Discuss parameter norm penalties in deep networks.	**4M**	CO3	U
iv)	Write a short note on Bidirectional RNNs.	**4M**	CO4	U
v)	Describe Generative adversarial network (GAN)	**4M**	CO6	U
vi)	Discuss generalized delta learning rule and its significance in Deep Neural networks.	**4M**	CO4	U
Q.3	**Solve any two questions out of three.**	**16**		
i)	Discuss Recurrent Neural network and its types with	**8M**	CO4	U

<table>
<tr><td></td><td>suitable diagram and example.</td><td></td><td></td><td></td></tr>
<tr><td>ii)</td><td>Solve the following with reference to Convolution neural network

i)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.

ii)Assume the feature map as given below

<table><tr><td>0.34</td><td>-0.22</td><td>0.35</td><td>0.12</td><td>-0.15</td></tr><tr><td>0.11</td><td>0.13</td><td>-0.21</td><td>0.33</td><td>0.45</td></tr><tr><td>-0.55</td><td>0.11</td><td>-0.41</td><td>0.44</td><td>0.33</td></tr><tr><td>-.55</td><td>0.55</td><td>0.34</td><td>0.34</td><td>-0.21</td></tr><tr><td>0.21</td><td>0.76</td><td>-0.11</td><td>0.23</td><td>-.32</td></tr></table>Apply ReLU activation function and generate feature map at next level and represent as M1.

iii)Apply minimum two types of pooling operation on M1 calculated in pervious step and generate resultant matrix .</td><td>8M</td><td>CO4</td><td>Ap</td></tr>
<tr><td>iii)</td><td>Write a short note on

1.Evolution of Deep Neural networks

2.Basic architecture on neural network</td><td>8M</td><td>CO1</td><td>U</td></tr>
<tr><td>Q.4</td><td>Solve any two questions out of three.</td><td>16</td><td></td><td></td></tr>
<tr><td>i)</td><td>Discuss Challenges in Neural Network Optimization</td><td>8M</td><td>CO3</td><td>U</td></tr>
<tr><td>ii)</td><td>Discuss Learning factors with reference to multilayer feedforward Network.</td><td>8M</td><td>CO2</td><td>U</td></tr>
<tr><td>iii)</td><td>Explain auto encoder and its applications</td><td>8M</td><td>CO5</td><td>U</td></tr>
</table>