

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

End Semester Exam

April - May 2021/ Nov - Dec 2021

(B. Tech / M. Tech.) Program: Electronics and Telecommunication Engineering

Examination: ~~FY/SY/TY/LY~~ Semester: ~~I/II/III/IV/V/VI/VII/VIII~~

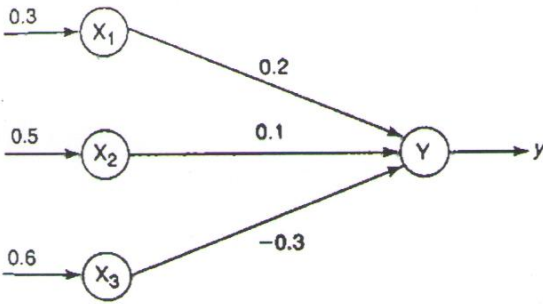
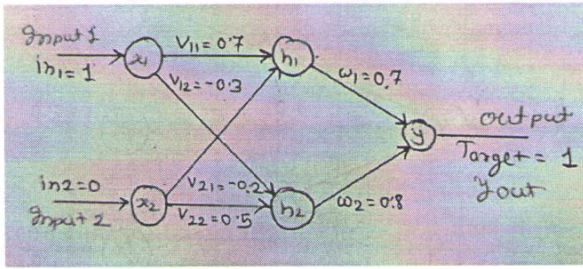
Course Code: IUEXDLC7041 and Course Name: Neural Networks and Deep Learning

Duration: 03 Hours Max. Marks: 60

Instructions:

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

Q. No.	Question	Max. Marks	CO	BT Level
Q 1	Solve any six questions out of eight:	12		
i)	What are the two important aspects of network operation?	2	1	U
ii)	State and explain different types of activation functions.	2	2	U
iii)	What is saddle point problem in neural network	2	3	U
iv)	What is forward propagation?	2	4	U
v)	Explain Max Pooling and its importance.	2	5	U
vi)	Explain Application of Neural Network with Examples	2	5	U
vii)	State the difference between biological neurons and artificial neurons	2	1	U
viii)	Outline the layer diagram of LeNet.	2	5	U

Q.2	Solve any four questions out of six.	16		
i)	State and prove perceptron Converge Theorem	4	1	U, AP
ii)	What is perceptron? What are the different types of perceptron?	4	1	U
iii)	Explain underfitting and overfitting in machine learning, explain how to deal with it.	4	3	U
iv)	Explain steps, Plots, Formulas, advantages, disadvantages of Adam optimization technique	4	2 & 3	U, AP, AN
v)	What is Regularization? Explain Dropout,	4	3	U, AP, AN
vi)	Find the output of the neuron Y for the network shown in figure below using binary sigmoid activation function	4	2, 4, 5	AP, AN
				
Q.3	Solve any two questions out of three.	16		
i)	Calculate set of New Weights of the network shown in below using Mean Square Error. (Show one Iteration)	8	1,2 & 4	AN, AN
				

ii)	Compare Resnet and Alexnet pretrained CNN	8	4 & 5	AN
iii)	Explain the use of FC layer and Pooling Layer in CNN	8	5	U
Q.4	Solve any two questions out of three.	16		
i)	Calculate set of New Weights of the network shown in below using Gradient Descent. (Show one Iteration)	8	1,2 & 4	AN, AP
<p>The diagram shows a neural network with the following components and values:</p> <ul style="list-style-type: none"> Input 1: $x_1 = 1$ Input 2: $x_2 = 0$ Hidden Node 1: h_1 Hidden Node 2: h_2 Output Node: y Weights: $v_{11} = 0.5$, $v_{12} = 0.3$, $v_{21} = -0.2$, $v_{22} = 0.7$, $w_1 = 0.7$, $w_2 = 0.8$ Target Output: 1 				
ii)	Distinguish the contrast between Data Augmentation, L1 and L2 Regulation Strategy.	8	2	U, AN
iii)	Draw and interpret function of each component in LSTM	8	5	U, AP

BT Levels:

- RE – Remembering,
- UN – Understanding,
- AP – Applying,
- AN – Analyzing,
- EV – Evaluating,
- CR – Creating.