Time: **3 Hours** Max. Marks: **80**

N.B.: (1) Q. 1 is compulsory. **80 Marks**
(2) Attempt any Three out of the remaining five.
(3) Figures to the right indicate full marks.

Q.1	**A**	Briefly describe the working of a McCulloch-Pitts Neuron Model	**5**
	B	Write a short note on Dataset Augmentation	**5**
	C	Explain Regularization vs. Optimization	**5**
	D	Write a short note on: Deep Learning vs. Traditional Machine Learning	**5**
Q.2	**A**	Explain the architecture of a Convolutional Neural Network with a neat diagram.	**10**
	B	Explain the Gradient based Learning in detail with suitable examples.	**10**
Q.3	**A**	What is multi-task learning? When should multi-task learning be used? Explain in detail.	**10**
	B	What is the activation function? List and explain the various activation functions used in models of artificial neurons.	**10**
Q.4	**A**	What is regularization? Explain types of regularization techniques in detail.	**10**
	B	What is the need for optimization? List and explain some of the challenges in neural network optimization.	**10**
Q.5	**A**	Explain Multi-Layered Perceptron (MLP) with a neat diagram	**10**
	B	Explain deep learning Applications with suitable examples.	**10**
Q.6	**A**	What are Recurrent Neural Networks (RNNs)? explain various applications of RNN with suitable examples.	**10**
	B	Explain the architecture, working and applications of the Long Short-Term Memory (LSTM) network.	**10**
