**Duration: 3 Hours** **[Max Marks: 80]**

(1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

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|---|---|---|---|
| 1 | | Attempt any **four** | **[20]** |
| | a) | Comment on the Representation Power of MLPs. | |
| | b) | Explain Gradient Descent in Deep Learning. | |
| | c) | Explain the dropout method and it's advantages. | |
| | d) | What are Denoising Autoencoders? | |
| | e) | Explain Pooling operation in CNN. | |
| 2 | a) | What are the Three Classes of Deep Learning , explain each? | **[10]** |
| | b) | Explain and analyze the architectural of AlexNet Convolution Neural Network. | **[10]** |
| 3 | a) | What are the different types of Gradient Descent methods, explain any three of them. | **[10]** |
| | b) | Differentiate between the architecture of LSTM and GRU network. | **[10]** |
| 4 | a) | Explain the key components of an RNN. | **[10]** |
| | b) | Consider a CNN layer with the following configuration:<br>-The input to the layer has 32 channels and a spatial size of 64x64.<br>-The convolutional layer has 64 filters (kernels), each of size 3x3, with a stride of 1 and no padding.<br>-Each filter is applied to every channel of the input.<br>Calculate the total number of parameters (weights) in this convolutional layer. | **[10]** |
| 5 | a) | Comment on the significance of Loss functions and explain different types of Loss functions while training a network. | **[10]** |
| | b) | Explain any three types of Autoencoders. | **[10]** |
| 6 | a) | What is the significance of Activation Functions in Neural Networks, explain different types Activation functions used in NN. | **[10]** |
| | b) | Explain Generative Adversarial Networks Architecture and its applications. | **[10]** |

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