

(Time: 2½ Hours)

[Total Marks: 60]

- N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculator is **allowed**.

1. Attempt **any two** of the following: 12
a. Explain Softmax function in detail.
b. Define Minimum, Maximum and Saddle point.
c. Compare Symmetric Matrix and Orthogonal Matrix.
d. Write a short note on a linear combination.
2. Attempt **any two** of the following: 12
a. Describe the Deep feedforward network with its types.
b. Explain in brief Gradient-Based Learning.
c. Write a short note on Underfitting and overfitting.
d. What is Dropout? Explain in detail.
3. Attempt **any two** of the following: 12
a. Give a comparison between Exploration and Exploitation.
b. Explain different types of Recurrent Neural Network .
c. Explain the classification process using sequence modeling.
d. Explain padding in Convolution Neural Network.
4. Attempt **any two** of the following: 12
a. Write a short note on the importance of Representation learning in deep learning.
b. Explain in brief about Autoencoders.
c. Write a short note on Linear Factor Models.
d. Write a short note on Slow feature analysis
5. Attempt **any two** of the following: 12
a. Write a short note on Boltzmann Machines.
b. Explain Conditional GANs in brief.
c. Explain the relationship between approximate Inference deep learning.
d. Write Maximum a Posteriori (MAP) algorithm.