Oct-/Nov-2025

Total No. of Questions : 5]

SEAT No. :

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S.Y.M.C.A. (Management)

DEL 616 MJ : DEEP LEARNING

(2024 Pattern) (Semester - III)

Dr. D. Y. Patil Institute of Management & Entrepreneurship Development LIBRARY

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Use of scientific calculator is allowed.*

Q1) Solve any two **[2×5=10]**

a) Explain Deep learning with suitable example.

b) What is Activation function? Explain Leaky ReLU with example.

c) Explain the role of loss function & Discuss cross entropy loss with suitable example.

d) What is Backpropagation? Explain its importance in training Artificial Neural Network.

Q2) Solve any two **[2×5=10]**

a) Consider the following input image matrix to be feed to CNN apply the convolution operation using given 2×2 Kernel (Stride = 2, No padding)

1	3	2	1	4
4	6	5	2	0
7	8	4	9	5
3	2	1	0	7
8	6	1	2	3

Input image matrix - 5×5

2	4
1	3

Kernel

b) Describe VGG from CNN Architectures with suitable diagram.

c) Illustrate and explain the working of the SSD object detection algorithm.

d) Explain how VIT converts an image into a sequence of tokens.

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Q3) Solve any two. **[2×5=10]**

a) Explain in detail architecture of a Recurrent Neural Network (RNN)

b) Explain the architecture of a Gated Recurrent Unit (GRU) and discuss how it overcomes the limitations of traditional RNN.

c) Demonstrate how Word2Vec and Glove capture semantic meaning of words through vector representation with suitable example.

d) What is multimodal model? Explain CLIP with suitable example.

Q4) Solve any two. **[2×5=10]**

a) Explain the architecture and working of GANs.

b) Illustrate how to tune hyper parameters of a CNN using grid search.

c) Describe the concept of Edge AI and enlist its advantages.

d) Discuss the importance of AI regulations.

Q5) Solve any one. **[1×10=10]**

a) Design and implement deep learning model using TensorFlow or PyTorch for classifying chest X-ray images into normal and abnormal cases indicating possible pneumonia. Describe the entire process including data set collection, data preprocessing, model architecture (such as CNN), Training and evaluation matrics, Justify your model.

b) Explain the design and implementation of a CNN model to classify retinal fundus images into normal and abnormal categories for diabetic retinopathy detection. Describe the steps involved in data preprocessing, CNN layer selection, training process and performance evaluation using accuracy, precision recall and F1 - score. Justify your model.

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