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M.Sc. (IT) (Sem. IX) Examination November - 2025

Deep Learning (New) (Paper - 902)

Time: 3 Hours] **[Total Marks: 70**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book.
(2) All questions are compulsory.
(3) Give examples wherever applicable

Seat No.:

Student's Signature

Q. 1. a) Describe the architecture of a perceptron with diagram, training algorithm and limitations. **(07)**

OR

a) Explain the significance of various Deep Learning libraries in brief.
b) Explain Mc-Culloch Pitts Neuron in detail **(05)**
c) Differentiate Machine learning and Deep Learning. **(02)**

Q. 2. a) Explain activation functions (Tanh, Sigmoid, ReLU, Softmax) **(07)**

OR

a) Explain Backpropagation in detail with equations for weight updates.
b) Explain about Multi layer perceptron. **(05)**
c) What do you mean by Bias in Neural Networks? **(02)**

Q. 3. a) Explain the structure of a CNN with Convolution, Pooling, and Flatten layers **(07)**

OR

a) Compare Fully Connected NN and CNN with advantages and disadvantages
b) Explain about YOLO or AlexNET architectures. **(05)**
c) What is padding in CNN? **(02)**

Q. 4. a) Explain the architecture and features of BERT. **(07)**

OR

a) Explain LSTM cell structure with gates and equations.
b) Explain about exploding gradient and vanishing gradient problem. **(05)**
c) What is bidirectional LSTM? **(02)**

Q. 5. a) Explain the architecture of Autoencoder with diagram. **(07)**

OR

a) Explain the architecture and working of GAN with diagram
b) Explain about hyper parameters of the Autoencoder architecture **(05)**
c) What is an Contractive Autoencoder? **(02)**