QP Code: RA22BTECH432 | Reg. No | | | | | | | | | | | AR 21/22

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech(Sixth Semester – Regular/Supplementary) Examinations, April 2025

21BCMPE36011/22BCMPE36011 – Deep Learning

(CSEAIML)

Time: 3 hrs | Maximum: 70 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. What is linear perceptron?	CO1	K1
b. Illustrate the importance of Sigmoid and ReLu activation function.	CO2	K1
c. What are the different types of optimizers used in deep learning ?	CO2	K1
d. Write the mathematical formula for different gates of LSTM.	CO3	K1
e. Define Stochastic Gradient Descent Optimization (SGD).	CO4	K1

PART – B **(15 x 4=60 Marks)**

Answer ***all*** the questions	Marks	CO #	Blooms Level
2. a. Explain the brief history, importance, application, advantages, disadvantages of deep learning Compare Machine Learning with Deep Learning.	8	CO1	K2
b. What are the different challenges faces by deep neural network. Write it importance and mathematically derive its equations.	7	CO2	K2
(OR)			
c. What is McCulloch-Pitts units neuron and threshold logic. Perform mathematical computation for AND , OR and AND NOT gates.	8	CO1	K2
d. What is deep feed forward network? Calculate total number of trainable parameters for Input Layer: 5 Neurons, Hidden 1: 10 Neurons, Hidden Layer 2 : 8 neurons, Hidden Layer 3 :6 Neurons, Output Layer: 3 Neurons.	7	CO2	K1
3.a. Write a short note on Tensor flow library with detailed diagram and predefined mathematical & elementary functions.	8	CO1	K2
b. Explain differentiation algorithm. Solve the gradient descent problem using 5 iterations for the given data $f(x) = x^2+3x+2$ and learning rate = 0.1	7	CO2	K3
(OR)			
c. What are the different deep learning libraries used for developing deep learning models?	8	CO2	K2
d. Train the perceptron for OR gate by considering following values w1=0.2 , w2=0.2, b=0.2, learning rate = 0.1 and Epoch = 2.	7	CO1	K3
4.a. Write a short note on Convolution Neural Network (CNN).	8	CO3	K2
b. Differentiate between Recurrent Neural Network and Bidirectional Recurrent Neural Network. Explain in details regarding RNN topologies.	7	CO3	K4
(OR)			
c. What are the different optimization techniques used in deep learning .Compare RMSprop with Stochastic Gradient Descent optimization.	8	CO4	K4

d.	Explain the working mechanism of Long Short Term Memory? How is it different from Bidirectional LSTM.	7	CO3	K2
5.a.	1. Input Layer = 784 neurons and hidden layer = 64 neurons. Find the compression ratio. 2. Original Input = [0.9, 0.3,0.7,1.0] Noisy Input = [0.7,0.0 , 0.9,0.6]. Calculate the noisy level in denoising autoencoder. 3. Calculate the compression space when 1024 dimensions is reduced to 16 dimensions.	8	CO4	K3
b.	Prepare a case study report on "Image Classification using Convolution Neural Network.	7	CO4	K2
	(OR)			
c.	Consider the given and evaluate the performance of LSTM model. Input x_t=0.7. previous hidden state h_{t-1}=0.6, previous cell state c_{t-1}=0.6, Forget gate : w_f=0.4, u_f=0.3, b_f=-0.1 Input gate : w_i=0.5, u_i=0.2, b_i= 0.05 Candidate Cell State : w_c=0.6, u_c=0.4, b_f= 0.2 Output gate : w_o=0.3, u_o=0.5, b_o=-0.1	8	CO3	K3
d.	Explain about different types of Autoencoders and its real-time applications.	7	CO4	K2

--- End of Paper ---