JHARKHAND Rai University
RANCHI

PRACTICE SET
End Semester (VII Sem.) Examination, December 2025

Program: B.Tech CSE
Semester: VII
Subject: Deep Learning
Subject Code: 3TECCS411

Course Outcomes	Description
CO1	Explore feed forward networks and Deep Neural networks.
CO2	Mathematically understand the deep learning approaches and paradigms
CO3	Complex feature extraction with CNN and RNNs
CO4	Apply the deep learning techniques for various applications.

Section A **(25 x 5= 125 Total Marks)**

1. A 2-input single-output NN has weight values [1, 3] and bias of 1.6. It is given an input $[3\ 4]^T$. What is the output if the identity function is used as the transfer function? [CO1] [Unit 1] [Apply LOT]
2. State the differences between supervised learning and unsupervised learning. [CO1] [Unit 1] [Understand LOT]
3. Describe Tensor flow and Keras. [CO1] [Unit 1] [Understand] [LOT]
4. Explain why regularization is considered effective in preventing overfitting in machine learning models. [CO2] [Unit 1] [Understand LOT]
5. Illustrate the operation of pooling layer in CNN with simple example. [CO2] [Unit 1] [Understand LOT]

6. Describe gradient descent. [CO2] [Unit 1] [Understand LOT]
7. Describe Deep Convolutional Neural Network. [CO3] [Unit 1] [Remember LOT]
8. Determine the shape of output matrix of an image of size 32 x 32 that uses a padding of 1, stride size 1, and a 3 x 3 filter. [CO2] [Unit 1] [Apply LOT]
9. Differentiate between LSTM and GRU. [CO3] [Unit 2] [Understand LOT]
10. Describe vanishing and exploding gradients. [CO3] [Unit 2] [Understand LOT]
11. Explain Recurrent Neural Network. [CO3] [Unit 2] [Understand LOT]
12. State the drawback of Rectified Linear Unit. [CO2] [Unit 2] [Understand LOT]
13. Explain bias in AI. [CO2] [Unit 4] [LOT]
14. List three stages of a convolutional network. [CO3] [Unit 2] [Understand LOT]
15. State any five applications of Deep learning for Natural Language Processing. [CO3] [Unit 3] [Understand LOT]
16. Compare and contrast stateful and stateless LSTMS. [CO3] [Unit 2] [Understand LOT]
17. Mention the Drawbacks of RNN [CO3] [Unit 2] [Understand LOT]
18. Discuss the features of GAN. [CO2] [Unit 2] [Understand LOT]
19. Define word embedding technique. [CO2] [Unit 3] [Remember LOT]
20. Explain reward and punishment in reinforcement learning. [CO4] [Unit 3] [Understand LOT]
21. List multiple attention mechanisms. [CO3] [Unit 3] [Remember LOT]
22. Describe autoencoders. [CO2] [Unit 4] [Remember LOT]
23. Explain vanilla encoders. [CO2] [Unit 4] [Understand LOT]
24. State the functions of Denoising autoencoders. [CO4] [Unit 4] [Understand LOT]
25. Explain any five applications of autoencoders. [CO4] [Unit 4] [Understand LOT]

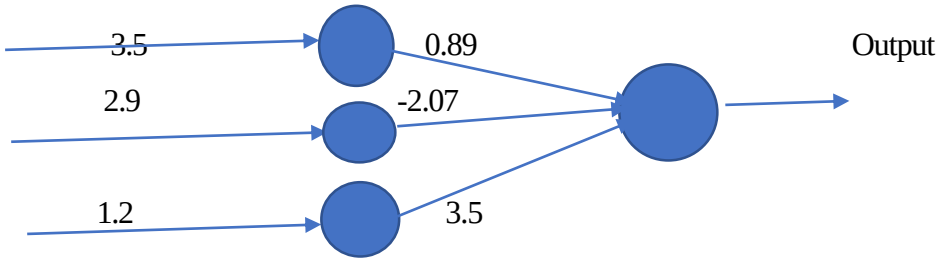
Section B **(12 x 10= 120 Total Marks)**

26. Classify the different activation functions of Deep learning. Also explain their suitability with respect to applications. [CO1] [Unit 1] [Analyze HOT]
27. Examine the components of Convolutional Neural Network architecture and analyse how the convolution, pooling, activation and fully connected layers work together to extract and classify features. [CO3] [Unit 1] [Analyze HOT]

28. Explain back propagation algorithm for neural network training. Illustrate the error propagation phase in the backward direction [CO1] [Unit 1] [Understand LOT]
29. Explain the working of Gated Recurrent Unit. [CO3] [Unit 2] [Understand LOT]

30. Analyse how the input, forget, and output gates in an LSTM help overcome the vanishing gradient problem in RNNs. [CO2] [Unit 2] [Analyze HOT]

31. Compute output of the following neuron if activation function is: [CO2] [Unit 1] [Apply LOT]
    (i) Binary sigmoid function
    (ii) Bipolar sigmoid function
    (iii) Tanh function
    (iv) | RELU function (assume same bias 0.5 for each node)



32. Describe Encoder-Decoder sequence to sequence architecture. [CO2] [Unit 3] [Understand LOT]
33. Classify the different topologies of the Recurrent Neural Network. [CO3] [Unit 2] [Evaluate HOT]
34. a) Explain the concept of deep feed forward neural networks. [CO1] [Unit 1] [Understand LOT]
    b) Discuss any four regularization techniques in deep learning. [CO1] [Unit 1] [Understand LOT]
35. Explain any 2 Deep learning algorithms and their performance factors. [CO4] [Unit 3] [Analyze HOT]
36. Illustrate different components of Reinforcement learning using suitable example. [CO4] [Unit 3] [Understand LOT]
37. Describe Generative Adversarial Network with a neat sketch. Explain its various classifications with necessary examples. [CO2] [Unit 3] [Understand LOT]
38. Explain any two Deep Reinforcement Learning Algorithm. [CO2] [Unit 3] [Understand LOT]

Section C **(5x 20= 100 Total Marks)**

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39. Explain transformer. Classify the different types of transformers. Discuss the features of any two-transformer based model. [CO4] [Unit 2] [Analyze HOT]
40. a) Explain the different design patterns in Recurrent neural networks. [CO3][Unit 2][Analyze HOT]
    b) Examine why Learning long term dependencies can be challenging and formulate any one solution to deal with this.
41. Discuss briefly how RNNs or its variants have been applied in solving real life applications. [CO4] [Unit 2] [Analyze HOT]
42. Classify Deep reinforcement learning algorithms. Explain Deep Q-network. Also describe the term "exploration vs exploitation" in reinforcement learning. [CO2] [Unit 3] [Analyse HOT]
43. a) Analyse the working of autoencoders. [CO4] [Unit 4] [Analyse HOT]

    b) Classify the different types of autoencoders.

Summary Sheet:

CO Wise

CO	Q. No	Marks
CO1	1,2,3,26,28,34	45
CO2	4,5,6,8,12,13,18,19,22,23,30,31,32,37,38,42	115
CO3	7,9,10,11,14,15,16,17,21,27,29,30,33,40	105
CO4	20,24,25,35,36,39,41,43	95
Total		**360**

Unit Wise

Unit	Q. No	Marks
Unit 1	1,2,3,4,5,6.7.8,26,27,28,31,34	90
Unit 2	9,10,11,12,13,14,16,17,18,29,30, 33,39,40,41	135
Unit 3	15,19,20,21,32,35,36,37,38,42	90
Unit 4	13,22,23,24,25,43	45
Total		**360**

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No	Marks
LOT	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19, 20,21,22,23,24,25,28,29, 31,32,34,36,37,38	205
HOT	26,27,30,33,35,39,40,41,42,43	150
Total		**360**

Analyze how regularization helps in reducing overfitting in machine learning models

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Disclaimer: -This is a Practice Set. The Question in End term examination will differ from the Practice Set. This Practice Set is meant for practice only.