[Nov-23]

GITAM (Deemed to be University)
[19EEC433A]
B.Tech. Degree Examination

Electronics & Communication Engineering
VII Semester

DEEP LEARNING

(Effective from the admitted batch 2019–20 onwards)

Time: 3 Hours **Max.Marks: 60**

Instructions: All parts of the unit must be answered in one place only.

Section-A

1. **Answer all Questions:** **(10×2=20)**

a) Define the term "backpropagation" in the context of neural network training.

b) List out the limitations of sigmoid activation function.

c) What is the function of a pooling layer in a CNN?

d) Recall the purpose of a stride in a convolutional layer.

e) What is the primary role of the encoder in an Encoder-Decoder architecture?

f) Which activation function is commonly used in LSTM cells to control the flow of information?

g) What is the fundamental concept of dimensionality reduction and how Autoencoders achieve it?

h) In what applications or domains might you choose to use a DBM over a GAN, and vice versa?

i) Interpret the role of anchor boxes and region proposal networks in object detection using deep learning.

j) What is the concept of attention mechanisms in sequence-to-sequence tasks and their role in improving LSTM-based video-to-text generation?

Section-B

Answer the following: **(5×8=40)**

UNIT-I

2. What is Dropout Regularization? How will dropout help with overfitting?

OR

3. Discuss about Heuristics for faster training in deep neural networks.

UNIT-II

4. Explain the architecture of convolutional neural network with a neat diagram.

OR

5. Compare the insights gained from feature map visualization with those obtained from occlusion sensitivity analysis. What unique information does each method provide?

UNIT-III

6. Differentiate between LSTM and GRU networks in terms of their architecture and gating mechanisms. What are the trade-offs between these two types of RNNs?

OR

7. Apply the concept of the "Unreasonable Effectiveness of RNNs" to a specific application domain, such as natural language processing or time series analysis. Provide examples of how RNNs have demonstrated their effectiveness in this domain.

UNIT-IV

8. Describe how the reparameterization trick enables the training of VAEs and why it is essential for the model's success.

OR

9. Define the concept of Generative Adversarial Networks (GANs) and explain their primary purpose in generative modeling.

UNIT-V

10. Describe the two-stage approach in Faster R-CNN, including the roles of the Region Proposal Network (RPN) and the object detection network.

OR

11. Explain the application of Deep Learning in image generation with GAN.