**VISHNU INSTITUTE OF TECHNOLOGY (A)**

**DEPARTMENT OF AI & DS, AI & ML**

**DEEP LEARNING**

**III B.Tech II SEM MID-II Objective Bits**

**Unit-III**

1. What is the primary purpose of a Convolutional Neural Network (CNN)? [ ]

a) Object detection b) Image classification

c) Text generation d) Reinforcement learning

2. Which layer type is typically used to extract local features in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

3. What is the advantage of using convolutional layers in a CNN? [ ]

a) They can capture local spatial patterns in the input data

b) They can handle sequential data

c) They can generate synthetic data

d) They can handle variable-length inputs

4. What is the purpose of the pooling layer in a CNN? [ ]

a) To reduce the spatial dimensions of the feature maps

b) To introduce non-linearity to the network

c) To adjust the weights and biases of the network

d) To compute the gradients for backpropagation

5. Which activation function is commonly used in the convolutional layers of a CNN? [ ]

a) ReLU (Rectified Linear Unit) b) Sigmoid

c) Tanh (Hyperbolic Tangent) d) Softmax

6. What is the purpose of the stride parameter in a convolutional layer? [ ]

a) To determine the size of the receptive field

b) To control the step size of the convolution operation

c) To adjust the learning rate during training

d) None of the above

7. Which layer type is used to reduce the spatial dimensions in a CNN? [ ]

a) Convolutional layer b) Pooling layer

8. What is the purpose of the padding parameter in a convolutional layer? [ ]

a) To adjust the learning rate during training

b) To prevent the reduction of spatial dimensions

c) To regularize the network and prevent overfitting

d) None of the above

9. Which layer type is responsible for making final predictions in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

10. What is the purpose of the fully connected layers in a CNN? [ ]

a) To capture global patterns and make predictions

b) To reduce the spatial dimensions of the input data

c) To apply non-linear transformations to the feature maps

d) To initialize the weights and biases of the network

11. Which layer type is responsible for applying non-linear transformations to the feature maps in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

12. What is the purpose of dropout regularization in a CNN?

a) To randomly disable neurons during training to prevent overfitting

b) To adjust the learning rate during training

c) To increase the number of layers in the network

d) None of the above

13. Which layer type is responsible for backpropagating the gradients and updating the network's parameters in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

14. What is the primary advantage of using a CNN over a fully connected neural network for image processing tasks? [ ]

a) CNNs can capture local spatial patterns in the input data

b) CNNs can handle sequential data

c) CNNs have a higher number of neurons

d) CNNs have a higher training speed

15. Which layer type is responsible for parameter sharing in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

16. What is the purpose of the receptive field in a convolutional layer? [ ]

a) To determine the number of filters in the layer

b) To determine the size of the feature maps

c) To specify the size of the local region for the convolution operation

d) None of the above

17. Which layer type is responsible for spatial downsampling in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

18. What is the purpose of the filter/kernel in a convolutional layer? [ ]

a) To determine the number of neurons in the layer

b) To specify the size of the feature maps

c) To extract local features from the input data

d) None of the above

19. Which layer type is commonly used in CNNs to normalize the input data? [ ]

a) Convolutional layer b) Pooling layer

c) Batch normalization layer d) Activation layer

20. What is the primary goal of training a CNN? [ ]

a) To minimize the prediction error on the training data

b) To maximize the number of layers in the network

c) To achieve 100% accuracy on the test data

d) None of the above

21. Which layer type is responsible for introducing translation invariance in a CNN? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Activation layer

22. What is the purpose of the output layer in a CNN? [ ]

a) To compute the predicted output based on the final feature representation

b) To reduce the spatial dimensions of the input data

c) To apply non-linear transformations to the feature maps

d) To initialize the weights and biases of the network

23. What is the purpose of zero-padding in a CNN? [ ]

a) To adjust the learning rate during training

b) To prevent the reduction of spatial dimensions

c) To regularize the network and prevent overfitting

d) None of the above

24. Which layer type is commonly used in CNNs for semantic segmentation tasks? [ ]

a) Convolutional layer b) Pooling layer

c) Fully connected layer d) Upsampling layer

25. What is the purpose of the loss function in CNN training? [ ]

a) To measure the prediction error and guide the learning process

b) To initialize the weights and biases of the network

c) To adjust the learning rate

**UNIT- IV**

1. What is the primary purpose of a Recurrent Neural Network (RNN)? [ ]

a) Image classification b) Text generation

c) Reinforcement learning d) Object detection

2. Which layer type is typically used to capture sequential dependencies in an RNN?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) Activation layer

3. What is the advantage of using recurrent layers in an RNN? [ ]

a) They can capture temporal dependencies in the input data

b) They can handle variable-length inputs

c) They can generate synthetic data

d) They can handle non-linear transformations

4. What is the purpose of the hidden state in an RNN? [ ]

a) To store the information from the previous time step

b) To adjust the learning rate during training

c) To compute the gradients for backpropagation

d) None of the above

5. Which activation function is commonly used in the recurrent layers of an RNN?

[ ]

a) ReLU (Rectified Linear Unit) b) Sigmoid

c) Tanh (Hyperbolic Tangent) d) Softmax

6. What is the purpose of the time step parameter in an RNN? [ ]

a) To determine the number of recurrent layers in the network

b) To adjust the learning rate during training

c) To specify the length of the input sequence

d) None of the above

7. Which layer type is commonly used to initialize the hidden state in an RNN?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) Activation layer

8. What is the purpose of the bidirectional RNN architecture? [ ]

a) To handle sequential data in both forward and backward directions

b) To reduce the computational complexity of the network

c) To adjust the learning rate during training

d) None of the above

9. Which layer type is responsible for making final predictions in an RNN? [ ]

a) Input layer b) Hidden layer

c) Output layer d) Activation layer

10. What is the purpose of the recurrent connection in an RNN? [ ]

a) To propagate the hidden state across different time steps

b) To adjust the weights and biases of the network

c) To reduce the dimensionality of the input data

d) None of the above

11. Which layer type is commonly used in RNNs for sequence-to-sequence tasks?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) Attention layer

12. What is the purpose of the backpropagation through time (BPTT) algorithm in RNN training? [ ]

a) To compute the gradients and update the network's parameters

b) To adjust the learning rate during training

c) To prevent overfitting by regularizing the model

d) None of the above

13. Which layer type is commonly used in RNNs to handle variable-length inputs?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) None of the above

14. What is the purpose of the initial hidden state in an RNN? [ ]

a) To provide the starting point for the recurrent computation

b) To adjust the learning rate during training

c) To compute the gradients for backpropagation

d) None of the above

15. Which layer type is responsible for handling the output at each time step in an RNN?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) Activation layer

16. What is the purpose of the teacher forcing technique in RNN training? [ ]

a) To adjust the learning rate during training

b) To propagate the gradients through time

c) To reduce the computational complexity of the network

d) None of the above

17. Which layer type is commonly used in RNNs for language modeling tasks?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) None of the above

18. What is the purpose of the sequence-to-vector architecture in an RNN?

[ ]

a) To process an input sequence and produce a fixed-length representation

b) To adjust the weights and biases of the network

c) To reduce the dimensionality of the input data

d) None of the above

19. Which layer type is responsible for introducing non-linearity in an RNN? [ ]

a) Input layer b) Hidden layer

c) Output layer d) Activation layer

20. What is the purpose of the forget gate in a Gated Recurrent Unit (GRU)?

[ ]

a) To control the flow of information from the previous hidden state

b) To adjust the learning rate during training

c) To compute the gradients for backpropagation

d) None of the above

21. Which layer type is commonly used in RNNs for machine translation tasks?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) Attention layer

22. What is the purpose of the peephole connections in a Long Short-Term Memory (LSTM) network? [ ]

a) To allow the cell state to influence the gating mechanisms

b) To adjust the learning rate during training

c) To introduce non-linearity to the network

d) None of the above

23. Which layer type is responsible for handling variable-length outputs in an RNN?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) None of the above

24. What is the purpose of the cell state in an LSTM network? [ ]

a) To store long-term dependencies in the input sequence

b) To adjust the learning rate during training

c) To compute the gradients for backpropagation

d) None of the above

25. Which layer type is commonly used in RNNs for speech recognition tasks?

[ ]

a) Input layer b) Hidden layer

c) Output layer d) None of the above

**UNIT-V**

1. What is computer vision? [ ]

a) The study of computer graphics

b) The study of computer networks

c) The study of algorithms for analyzing and interpreting visual data

d) The study of computer hardware architecture

2. Which of the following is not a fundamental task in computer vision? [ ]

a) Object detection b) Image classification

c) Speech recognition d) Image segmentation

3. Which technique is commonly used for edge detection in images? [ ]

a) Fourier transforms b) Histogram equalization

c) Canny edge detection d) Gaussian blur

4. Which of the following algorithms is commonly used for image classification?

[ ]

a) K-means clustering b) Decision trees

c) Convolutional Neural Networks (CNN) d) Support Vector Machines (SVM)

5. Which concept is used to represent the transformation from a 3D scene to a 2D image? [ ]

a) Perspective projection b) Affine transformation

c) Euler angles d) Homography

6. Which technique is used to detect and track objects in a sequence of frames?

[ ]

a) Optical flow b) Template matching

c) Harris corner detection d) Scale-invariant feature transform (SIFT)

7. Which metric is commonly used to evaluate the performance of object detection algorithms? [ ]

a) Precision b) Recall

c) F1 score d) All of the above

8. Which technique is used to remove noise from images while preserving important details? [ ]

a) Median filtering b) Sobel operator

c) Histogram equalization d) Laplacian of Gaussian (LoG) filter

9. Which algorithm is commonly used for image segmentation? [ ]

a) K-means clustering b) Depth-first search

c) Gaussian blur d) Fourier transform

10. Which technique is used to recognize and understand text in images or videos?

[ ]

a) Optical character recognition (OCR) b) Motion detection

c) Feature extraction d) Image stitching

11. Which of the following is a popular pre-trained deep learning model for image classification? [ ]

a) AlexNet b) K-means

c) Random Forests d) Principal Component Analysis (PCA)

12. Which technique is used to estimate the camera's pose and reconstruct the 3D structure of a scene? [ ]

a) Depth estimation b) Stereo vision

c) Structure from Motion (SfM) d) Texture mapping

13. Which concept is used to represent the local features of an image that are invariant to scale and rotation? [ ]

a) Hough transform b) Histogram of Oriented Gradients (HOG)

c) Scale-invariant feature transform (SIFT) d) Eigenfaces

14. Which technique is used to align two or more images to create a single panoramic image? [ ]

a) Image segmentation b) Template matching

c) Image stitching d) Image compression

15. Which method is used to generate realistic images by learning from a large dataset?

[ ]

a) GANs (Generative Adversarial Networks) b) Random Forests

c) K-means clustering d) Principal Component Analysis (PCA)

16. Which of the following is not a task in natural language processing? [ ]

a) Sentiment analysis b) Speech recognition

c) Image classification d) Named entity recognition

17. What is the primary goal of natural language processing? [ ]

a) Understanding and generating human language

b) Translating languages

c) Analyzing data patterns

d) Creating conversational agents

18. Which of the following techniques is commonly used in text classification tasks?

[ ]

a) Latent Semantic Analysis (LSA)

b) Convolutional Neural Networks (CNN)

c) Principal Component Analysis (PCA)

d) Support Vector Machines (SVM)

19. What is the process of converting words into their base or root form called?

[ ]

a) Tokenization b) Stemming

c) Lemmatization d) Part-of-speech tagging

20. Which algorithm is commonly used in named entity recognition? [ ]

a) K-means clustering b) Hidden Markov Models (HMM)

c) Apriori algorithm q d) Decision trees

21. What is the purpose of the Bag-of-Words (BoW) model in NLP? [ ]

a) To represent words as vectors b) To calculate word frequencies

c) To identify syntactic dependencies d) To perform sentiment analysis

22. Which NLP library in Python provides a comprehensive set of tools for natural language processing? [ ]

a) TensorFlow b) PyTorch

c) NLTK (Natural Language Toolkit) d) Scikit-learn

23. Which of the following is an example of a stop word? [ ]

a) Noun b) Verb

c) Adjective d) The

24. Which technique is used to predict the probability of a sequence of words in a given context? [ ]

a) Language modeling b) Named entity recognition

c) Sentiment analysis d) Machine translation

25. Which NLP task involves labeling words in a sentence with their respective grammatical categories? [ ]

a) Named entity recognition b) Part-of-speech tagging

c) Dependency parsing d) Sentiment analysis

26. Which neural network architecture is commonly used for sequence-to-sequence tasks like machine translation? [ ]

a) Long Short-Term Memory (LSTM) b) Convolutional Neural Network (CNN)

c) Recurrent Neural Network (RNN) d) Transformer

27. Which of the following algorithms is used for topic modeling? [ ]

a) K-means clustering b) Naive Bayes

c) Latent Dirichlet Allocation (LDA) d) Random Forests

28. Which technique aims to identify and extract the main ideas or topics from a collection of documents? [ ]

a) Sentiment analysis b) Text summarization

c) Named entity recognition d) Document clustering

29. Which metric is commonly used to evaluate machine translation systems?

[ ]

a) BLEU score b) F1 score

c) Precision d) Recall

30. Which of the following is an example of a word embedding technique? [ ]

a) One-Hot Encoding b) Bag-of-Words

c) Latent Semantic Analysis (LSA) d) Word2Vec