SRM Institute of Science and Technology

Data Science and Business Systems,

School of Computing Kattankulathur

Academic Year: 2024-25 (ODD)

**Test: CLA-T1** **Date: 27-08-2024**

**Course Code & Title: 18CSE484T – Convolutional Neural Network** **Duration:** 1 hour

**Year & Sem: IV Year / VII Sem** **Max. Marks:** 25

Part A (5 x 1 = 5)

**1. What is the primary function of a Convolutional Neural Network (CNN)?**

A. Classifying text data
B. Processing sequential data
C. Recognizing patterns in image data
D. Predicting numerical values

**2. Which layer in a CNN is responsible for extracting features from an image?**

A. Fully connected layer
B. Convolutional layer
C. Pooling layer
D. Activation layer

**3. What is the purpose of a pooling layer in a CNN?**

A. Increasing the dimensionality of feature maps
B. Reducing the dimensionality of feature maps
C. Adding non-linearity to the network
D. Normalizing the input data

**4. Which activation function is commonly used in CNNs?**

A. Sigmoid
B. ReLU
C. Softmax
D. Tanh

**5. What is the role of a fully connected layer in a CNN?**

A. Extracting local features
B. Reducing dimensionality
C. Combining features and making predictions
D. Introducing non-linearity

Part B (3 x 2 = 6)

6. What is the role of convolution in a CNN?
7. Explain the concept of feature extraction using convolution filters.
8. A 4x4 image is given with a 3x3 filter. What padding is required to maintain the original image size?

Part C (2 x 7 = 14)

9. A CNN consists of the following layers:

   Input: 64,64

   Conv layer: 32 filters, kernel size 3x3, stride 1, padding 'same', input channels 3.

   Max pooling: 2x2.

   Conv layer: 64 filters, kernel size 3x3, stride 1, padding 'same'.

   Fully connected layer: 1024 neurons.

   Output layer: 10 neurons.

   Calculate the total number of parameters in the network.

10. Explain the basic structure of a CNN, including its core components.