CNN MCQ Quiz (Chapter 5)

Instructions: Select the best answer for each question.

1. What is the primary purpose of a CNN?

a) Process text data

b) Analyze visual data like images

c) Play music

d) Manage databases

2. Which layer in a CNN detects features like edges and shapes?

a) Pooling layer

b) Convolutional layer

c) Output layer

d) Input layer

3. What does the "ReLU" activation function do?

a) Returns negative values

b) Returns 0 for negative inputs, keeps positive values

c) Returns only negative values

d) Deletes data

4. Why are CNNs better than regular neural networks for images?

a) They use more memory

b) They preserve spatial relationships between pixels

c) They ignore patterns

d) They work only with text

5. What is the main job of a pooling layer?

a) Add more pixels

b) Reduce spatial dimensions (shrink the image)

c) Change image colors

d) Delete edges

6. Which pooling method keeps the maximum value in a window?

a) Average pooling

b) Max pooling

c) Min pooling

d) Sum pooling

7. What is a "kernel" in a CNN?

a) A type of fruit

b) A small matrix used to detect features

c) The output layer

d) A loss function

8. What does "stride" control in a CNN?

a) Image brightness

b) How much the kernel moves across the image

c) The number of layers

d) The learning rate

9. Which layer connects every neuron to all neurons in the next layer?

a) Convolutional layer

b) Fully connected (Dense) layer

c) Pooling layer

d) Input layer

10. What is the last layer in a CNN for classification tasks?

a) ReLU layer

b) Softmax layer (for probabilities)

c) Pooling layer

d) Kernel layer

11. What does "padding" do in a CNN?

a) Deletes edges

b) Adds extra pixels to control output size

c) Speeds up training

d) Changes image colors

12. Which activation function is used for binary classification?

a) Softmax

b) Sigmoid

c) Tanh

d) ReLU

13. What does "flatten" do in a CNN?

a) Makes images blurry

b) Converts a matrix into a vector for the Dense layer

c) Deletes layers

d) Adds more kernels

14. Why is translational invariance important in CNNs?

a) To recognize objects only at the center

b) To recognize objects anywhere in the image

c) To ignore objects

d) To delete pixels

15. Which dataset is commonly used to train CNNs for digit recognition?

a) CIFAR-10

b) MNIST

c) IMDb

d) Titanic

16. What is the role of the input layer in a CNN?

a) Detect edges

b) Receive and normalize pixel values

c) Delete images

d) Add noise

17. Which component reduces overfitting in CNNs?

a) Increasing stride

b) Pooling layers

c) Removing kernels

d) Using only one layer

18. What does a feature map represent?

a) A geographic map

b) Extracted features (e.g., edges) from an image

c) A loss function

d) A type of layer

19. Which optimizer is commonly used in CNNs?

a) SGD

b) Adam

c) JPEG

d) CSV

20. What is the output of a Softmax layer?

a) A single number

b) Probabilities for each class

c) A kernel

d) A pooled image

21. What problem does ReLU help avoid?

a) Overeating

b) Vanishing gradients

c) Too many layers

d) Small datasets

22. Which layer comes after convolutional layers in a CNN?

a) Input layer

b) Pooling layer

c) Output layer

d) Loss layer

23. What is the purpose of non-linear activation functions?

a) To make models linear

b) To learn complex patterns

c) To delete data

d) To slow training

24. Which metric evaluates CNN performance?

a) Loss

b) Accuracy

c) Kernel size

d) Stride value

25. What does "MNIST" contain?

a) Cat images

b) Handwritten digits (0-9)

c) Movie reviews

d) Audio clips