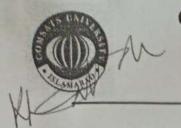
COMSATS University Islamabad, Attock Campus



histograms and scatter plots?

training and validation loss and accuracy during training?

Department of Computer Science

Program: BS (AI)-III

Fall 2022 Terminal Examination Course: - Programming for Artificial Intelligence Marks: - 70 Time Allowed: - 180 Minutes Dated:- 13/01/2023 Reg. No.:- 621-601-016 Name:- Ucman Note:- Don't write anything on Question Paper except your name & Reg. No. Q#01: Answer the following short questions by writing the python code, each question carry 3 (CLO-4) marks. - Part (a): Use NumPy library to perform any mathematical operations on arrays and matrices in Python? Part (b): Write a sample program in python to implement dropout regularization in CNN model to reduce overfitting and batch normalization to improve training? -Part (c): Apply NLTK library to tokenize, preprocess text data and perform natural language processing? Part (d): Use a sample program in python to load a dataset using pandas and convert it into a format suitable for training a machine learning model? Q#02: Answer the following short questions (Maximum 5 lines), each question carry 3 marks. (CLO-2) > Part (a): Differentiate between a 2D convolutional layer and a fully connected layer in a neural network? Part (b): Demonstrate fine-tuning a pretrained CNN model for a new task using transfer learning? _ Part (e): Illustrate the use of data augmentation to improve the performance of CNN model on image classification tasks? Part (d)? Demonstrate the selection of kernel size, stride, and padding and how it affect the number of parameters in a 2D convolutional layer? Part (e): Explain the use of matplotlib to visualize data and plot various charts such as

Q#03: Differentiate between the following highlighted terms and python functions (Maximum 5 lines), Each question carry 3 marks. (CLO-1) (30)

Part (f): Illustrate the use of matplotlib to visualize the architecture of a CNN and plot the

- a) StandardScaler() class and MinMaxScaler() class in scikit-learn?-
- b) one_hot() function and get_dummies() function in pandas?-
- c) fit() and fit transform() functions in scikit-learn?
- d) LinearRegression() and LogisticRegression() classes in scikit-learn?-
- e) Batch size and Epochs?
- f) MaxPooling2D and AveragePooling2D layer in Keras?-
- g) Conv2D and Conv1D layers in Keras? -
- h) Sigmoid and softmax activation functions? -
- i) Feature and a label in the context of machine learning?__
- j) Overfitting and underfitting in machine learning?_

```
Q#04: Given below is the snippet of code to answer the following questions? (CLO-3)
```

```
from keras.models import Sequential
from keras.layers import Conv2D, MaxPooling2D, Flatten, Dense
model = Sequential()
model.add(Conv2D(32, (3, 3), activation='relu', input_shape=(28, 28, 1)))
model.add(MaxPooling2D(pool_size=(2, 2)))
model.add(Flatten())
model.add(Dense(128, activation='relu'))
model.add(Dense(10, activation='softmax'))
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
```

Part (a): Explain the use of loss function in the given code? (03)

Part (b): Give the purpose and use of the 'flatten' layer in this model? (03)

Part (c): Interpret the number of output classes? (02)

Part (d): Relate the use of dense 128 layer? (02)