COMSATS University Islamabad

ABBOTTABAD CAMPUS

Terminal Examination

FALL 2025

Class: BCS-6C
Instructor: Zeenat Zulfiqar
Maximum Marks: 50

Subject: Artificial Intelligence
Deadline: 18/12/2025

Student Name: _____ **Roll Number:** _____

Note:

- *Students work on their own and do not consult each other.*
- *You have to submit running code. ipynb file and Pdf file*
- *You must use google colab to generate results*
- *Write your name and registration ID on the first page of your file.*
- *The submission of answer copy(ies) will be considered acceptable through CUI only. Therefore, do not submit your files through email or any other medium.*
- *Do not copy paste answers from the internet or other sources. The plagiarism of your answers may be checked through Turnitin.*
- *Timely submission is required, if even 01 min late the exam will not be accepted at all.*
- *Double check all your files before uploading it on CUI to ensure that you have uploaded the correct files with your answers.*
- *Good Luck*

The viva examination is mandatory for all students.

CLO-6

Question 1: Machine Learning Model Implementation (15 Marks)

Use the Titanic dataset and perform the following tasks

1. Load the dataset in Google Colab.
2. Perform data preprocessing:
    - Handle missing values
    - Encoding categorical features

- Normalize or standardize the data

3. Split the dataset into training and testing sets.
4. Train any one ML model (choose one):
    - KNN
    - K-means Clustering
    - Decision Tree
    - Random Forest
    - Logistic Regression
5. Evaluate the model using:
    - Accuracy
    - Precision
    - Recall
    - F1-Score
6. Display results in a data frame format.

Question 2: Deep Learning Model Implementation (15 Marks)

Use CIFAR-10 dataset and perform the following tasks

1. Build a deep learning model using **Keras/TensorFlow**.
2. You may choose any one DL architecture:
    - ANN
    - CNN
    - LSTM
    - RNN
3. Train the model and show:
    - Training Loss
    - Validation Loss
    - Training Accuracy
    - Validation Accuracy
4. Plot the graphs for:
    - Loss vs Epochs
    - Accuracy vs Epochs
5. Save the trained model.

Question 3: Hybrid Model (DL + ML or DL + DL) (10 Marks)

Build any hybrid model using one of the combinations below:

Choose one combination:

- CNN + LSTM

- RNN+ CNN
- RNN+LSTM
- ANN + Random Forest (DL+ML hybrid)

Tasks:

1. Preprocess the data.
2. Build the hybrid model.
3. Train and test the model.
4. Evaluate using:
    - Accuracy
    - Loss
    - Confusion Matrix
5. Compare hybrid performance with the model used in Q2.

Question 4: Viva Question **(10 Marks)**