B.Tech. (CSE-Artificial Intelligence & Machine Learning Engineering) 8th Semester (G-Scheme) Examination, May–2024

APPLIED MACHINE LEARNING

Paper– PCC-AI-403-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: ***Question one is compulsory*** *having* ***six*** *parts and each part is of 2.5 marks total of 15 marks and the remaining questions are of 15 marks. And attempt one question from each section.*

1. (a) Discuss the importance of sequential tagging in text feature engineering. 2.5

   (b) Explain how the bag of words model is implemented using random forests. 2.5

   (c) How does topic modeling help in identifying patterns in text? Discuss with examples. 2.5

   (d) Describe the process of synthesizing music in speech recognition. 2.5

   (e) Discuss the role of Conditional Random Fields (CRF) in handling sequential text data. 2.5

   (f) Explain the process of resizing and scaling images in biometric face recognition. 2.5

Unit-I

2. Explain the concept of stemming and lemmatizing in text feature engineering. How do they contribute to text normalization? 15

3. Implement topic modeling on a given text corpus using the Latent Dirichlet Allocation (LDA) algorithm. 15

Unit-II

4. Discuss the process of slicing and operating on time series data using Python libraries like Pandas and NumPy. 15

5. Build a speech recognizer using Hidden Markov Models (HMM) and MFCC features. Explain the training and prediction process. 15

Unit-III

6. Explain the working principle of edge detection techniques such as Sobel, Laplacian, and Canny edge detectors. 15

7. Explain the steps involved in operating on images using OpenCV-Python for image content analysis. 15

Unit-IV

8. Discuss the process of face detection from images and videos using Haarcascades. How does it contribute to biometric face recognition? 15

9. Perform Kernel Principal Components Analysis (KPCA) on a given face dataset explaining each step and discussing its significance in face recognition. 15