

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- APRIL-2023

COURSE CODE(03):19B1WEC836 (03)

MAX. MARKS: 25

COURSE NAME: Applied Medical Signal Processing

COURSE INSTRUCTORS: Dr. Sunil Datt Sharma

MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

- Q1. Draw the block diagram of spectrogram and convolution neural network-based algorithms for the classification of arrhythmia using ECG signal processing. Also, explain the each block of the algorithm. [CO-3, Marks-04]
- Q2. Write a MATLAB program to generate Non-stationary signal and its spectrogram. Also, highlights the shortcomings of the short-time Fourier transform. [CO-1, Marks-04]
- Q3. Tabulate the frequently occurring noises in the ECG signal in terms of their source, spectral range, and affected features. [CO-2, Marks-04]
- Q4. Explain the usefulness of auto-encoder for de-noising and explain the role encoder and decoder in de-noising with help of mathematical function. [CO-2, Marks-04]
- Q5. Write in brief about the ECG arrhythmia dataset of five classes Normal, left bundle branch block beat, right bundle branch block beat, pre-mature ventricular contraction beat, and atrial premature contraction beat, and collected from MIT-BIH arrhythmia database. [CO-4, Marks-04]
- Q6. Compute the evaluation parameters sensitivity, specificity, accuracy, precision, and F-measure of a machine learning model for the given confusion matrix:

	Normal (Actual)	Abnormal (Actual)
Normal (Predicted)	85	4
Abnormal (Predicted)	2	9

[CO-4, Marks-05]