

B-E Sem-VII C-Scheme Summer 2025 EXTC.  
16/16/25  
[Marks: 80]

(3 Hours)

- N.B.: 1) Question No. 1 is compulsory.  
 2) Answer any three out of remaining questions.  
 3) Assume suitable data if necessary.  
 4) Figures to the right indicate full marks.

- Q1. (a) What are the key advantages of using AI for medical diagnosis compared to traditional methods. (5)  
 Q1. (b) Why is explainability important for NLP applications in healthcare? (5)  
 Q1. (c) What are the key steps involved in the Knowledge Discovery and Data Mining (KDD) process? (5)  
 Q1. (d) Compare Grid Search to Random Search in hyperparameter tuning. (5)  
 Q2. (a) Explain Ethics of intelligence with example. (10)  
 Q2. (b) How can AI assist in remote patient monitoring and follow-up care? (10)  
 Q3. (a) Explain Multi-Classifer Decision Fusion, and how does it enhance classification accuracy in medical diagnosis? (10)  
 Q3. (b) Explain Evidence based Medicine. What are the key challenges in integrating AI into evidence-based medicine? (10)  
 Q4. (a) Explain Natural Language Processing (NLP) components with suitable example. (10)  
 Q4. (b) Discuss dimensionality reduction techniques used to handle high-dimensional medical data? (10)  
 Q5. (a) An AI model has been developed to predict the presence of a certain disease. A model is tested on a dataset of 100 patients to classify whether they have a certain disease (Positive) or not (Negative). The confusion matrix is as follows:

Table 1: Confusion Matrix

	Predicted Positive	Predicted Negative
Actual Positive	40	10
Actual Negative	20	30

- Based on this confusion matrix, define and calculate the following:  
 Accuracy, Precision, Recall (Sensitivity), F1-score (10)  
 Q5. (b) Define Intelligent Personal Health Record (iPHR). How can AI-driven HHPs help in elderly care and remote patient monitoring? (10)  
 Q6. Explain any Two: (20)  
 a) Ensemble Learning  
 b) Genetic Algorithm  
 c) Convolution Neural Network  
 d) Deep Learning

\*\*\*\*\*