

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec. 2025-26

B.Tech. Program: DS Scheme : **IIB 8I**

Examination: **Honors** Semester: **VII**

Course Code: **HDSC701**

Course Name: **Data Science for Health and Social Care**

Date of Exam: **21/11/25**

Duration: 2.5 Hours

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Describe the ' Temporal Pattern Mining ' in detail.		CO5	U
b)	Discuss the method of finding the characteristic equation of a 3x3 matrix and 2x2 matrix. Find the characteristic equation of a matrix A $A = \begin{pmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{pmatrix}$		CO2	Ap
c)	Explain ' Identifying Fraudulent Providers ' in detail.		CO6	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	State & discuss the ' Rule based ' and ' Pattern based ' approaches in detail.		CO3	U
b)	Describe ' Privacy-Preserving Data Publishing Methods for Healthcare ' in detail.		CO5	U
c)	Explain ' Non-knowledge-Based ' CDSS in detail.		CO6	U
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Explain EHR in detail.		CO1	U
b)	Discuss in detail " Genomic Data Analysis for Personalized Medicine ".		CO2	U
c)	Using two CAD applications, demonstrate how to apply the Computer-		CO6	U

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	Aided Diagnosis/Detection process to medical imaging.			
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Identify the detailed breakdown structure for the text: ' The clinic administered the vaccine to elderly patients ' using the Syntax & Lexical analysis technique. Analyze its tree structure representation.		CO3	An
b)	Apply the Topic Model (Latent Dirichlet Allocation) Algorithm on the below corpus which contains:- d1:- The president declared war against Russia d2:- The student slept in instead of studying for his exam Calculate the Document-Topic as well as Topic-Word matrices. Discuss this approach in detail.		CO4	Ap
c)	Apply your understanding of Artificial Neural Networks and Cost-Sensitive Learning as alternative prediction models to a real-world scenario; choose a specific disease or condition (e.g., heart failure, diabetes, or cancer). Compare Multiple Instance Learning and Reinforcement Learning as advanced prediction models for predicting patient outcomes.		CO5	Ap
