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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90032

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Fourth Semester

Artificial Intelligence and Data Science

AD 8002 — HEALTH CARE ANALYTICS

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Bayes Theorem.
2. What is Medline? What is it used for?
3. Write a note of the Pandas Data frame.
4. Mention any three types of smart sensors that are used in the modern clinical setup.
5. Define HPI. What is it important to know HPI aspects of a patient?
6. Distinguish between data, information and knowledge.
7. Describe the various data formats used in healthcare analytics with a relevant example for each.
8. Differentiate between linear and logistic regression.
9. Briefly the process of imputation with a relevant example.
10. What is readmission modeling? Why is it important?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the various types of ML foundational techniques employed in healthcare ecosystems. Compare and contrast between each to highlight their relative merits and drawbacks.

Or

(b) Write a detailed note on the UMLS vocabulary. Discuss its various components and describe their role in the development of computer systems for healthcare.

12. (a) What are the various techniques that can be used for exploring and visualizing different types of clinical data? Demonstrate any one popular method used to assess the variability and skewness of given binary/categorical data.

Or

(b) Discuss the various metrics used for evaluating a clinical model's performance. Give a relevant scenario to highlight the use of each metric.

13. (a) Discuss how Statistics and Collaborative Knowledge Exchange (SCKE) Systems are designed and leveraged as a Healthcare Semantic Frameworks.

Or

(b) With a neat diagram and a suitable example, describe how recurrent neural networks can be used for dealing with sequences in clinical data.

14. (a) Discuss the common database security threats that may cause clinical database breaches. How can these be mitigated using a matrix block cipher system? Analyze the requirements and explain the process in detail with a neat diagram.

Or

(b) Explain the fundamentals and the process of frequent pattern mining on clinical data with a suitable example end-user application.

15. (a) Why is denoising essential for signal data? Explain the various dimensionality reduction based techniques using which ECG signals can be denoised.

Or

(b) Explain in brief the process of identifying patients who are at a high risk of all-cause mortality with the next 6 months, using available clinical data of the patients

PART C — ($1 \times 15 = 15$ marks)

16. (a) Describe the process of preprocessing rs-fMRI data.

Or

(b) With a neat diagram, demonstrate the design and development of a smart ambulance Smart Ambulance System using the concepts of cloud computing and IoT.
