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Question Paper Code:U7E03

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Seventh Semester

21UAD703 – BIG DATA VISUALIZATION

Artificial Intelligence & Data Science

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. You are tasked with improving the performance of a big data analytics project. Apply any two best practices to optimize the data processing and explain how they contribute to better outcomes. CO2-App
2. What does the "Reduce" function do in MapReduce? CO1-U
3. How do you use Hive to create and query a table for sales data? CO2-App
4. What is a keyspace in Cassandra? CO1-U
5. How would you apply the seven stages of visualization to represent COVID-19 data? CO2-App
6. Choose a suitable tool and apply it to visualize stock market trends. CO2-App
7. Compare node-link graphs with matrix representations for visualizing networks. CO3-Ana
8. Describe the use of scatter charts in identifying relationships in data. CO1-U
9. How would you visualize intrusion detection log data using a heat map? CO2-App
10. Apply visualization to analyze firewall logs for anomalies. CO2-App

PART – B (5 x 16= 80 Marks)

11. (a) Describe the characteristics of Big Data and its importance in real-world applications. CO1-U (16)
Or
(b) Summarize the functions of MapReduce and YARN in Big Data processing. CO1-U (16)

12. (a) Design a Hive table schema to store customer transaction data. Discuss your choice of data types and file formats, explaining how these choices optimize query performance and storage efficiency. CO1-U (16)
- Or
- (b) Write an HBase schema suitable for storing time-series IoT sensor data. Explain how the schema supports efficient storage and retrieval. Additionally, describe how HBase clients such as the shell and Java API can be used to insert and query data effectively. CO1-U (16)
13. (a) Apply data visualization methodology to design a dashboard for an e-commerce business. CO2-App (16)
- Or
- (b) Use a visualization tool like Tableau or Power BI to create a visual story from a dataset and explain how it helps communicate insights. CO2-App (16)
14. (a) Use a node-link diagram to build a graph-based visualization that shows an organization's hierarchy. CO2- App (16)
- Or
- (b) Apply various chart types (area, scatter, pivot) to visualize a multi-dimensional dataset. CO2-App (16)
15. (a) Describe the process and importance of visualizing cyber security data. CO1-U (16)
- Or
- (b) Discuss how visualization systems themselves can become targets for attackers. Explain common techniques used to attack visualization systems. CO1-U (16)