UNIT 1: Introduction to Big Data

Segment A — Conceptual Understanding

1. Define Big Data and explain the difference between structured, semi-structured, and unstructured data with suitable examples.
2. Explain the evolution of Big Data and why traditional Business Intelligence (BI) approaches are inadequate for handling Big Data.

Segment B — Analytical Understanding

3. Analyze the significance of the 3Vs (Volume, Velocity, Variety) in Big Data and discuss how they impact data storage and processing technologies.
4. Discuss the critical challenges organizations face while adopting Big Data technologies and suggest ways to overcome them.

Segment C — Application & Industry Use Cases

5. How is Big Data Analytics applied in the healthcare industry to improve patient care and operational efficiency?
6. Discuss how industries like e-commerce, banking, or manufacturing utilize Big Data Analytics to enhance customer experience and gain business insights.

Segment D — Comparative & Decision Making

7. Compare and contrast Traditional Business Intelligence systems with Big Data Analytics platforms based on scalability, data variety handling, and decision-making capabilities.
8. How does Big Data Analytics support real-time decision-making in sectors like e-commerce or financial services?

UNIT 2: NoSQL Data Management

Segment A — Conceptual Understanding

1. What is NoSQL? Explain its need in Big Data environments and list its main types with examples.
2. Describe the differences between SQL, NoSQL, and NewSQL databases in terms of data model, scalability, and transaction support.

Segment B — Analytical Understanding

3. Analyze how NoSQL databases address the challenges of managing unstructured and semi-structured data in Big Data applications.
4. Discuss the significance of partitioning and aggregation in NoSQL databases and how they help in handling large datasets.

Segment C — Application & Industry Use Cases

5. How are NoSQL databases applied in healthcare systems for managing electronic health records and real-time patient monitoring?
6. Explain the role of NoSQL databases in e-commerce platforms for inventory management, customer profiling, and recommendation engines.

Segment D — Comparative & Decision Making

7. Evaluate the role of MapReduce in the NoSQL ecosystem and how it supports distributed data processing in Big Data analytics projects.
8. Compare the suitability of key-value stores, document stores, and graph databases for different real-world applications in Big Data.