

# SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER APPLICATIONS

QUESTION BANK



III SEMESTER

PMC304- BIG DATA ANALYTICS

Regulation – 2024

Academic Year 2024 – 25 (ODD)

*Prepared by*

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# SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur- 603 203

## DEPARTMENT OF COMPUTER APPLICATIONS

Academic Year 2025-2026

### QUESTION BANK- ODD SEMESTER

**SUBJECT : PMC304 - BIG DATA ANALYTICS**

**YEAR / SEM: II / III SEM MCA**

<b>UNIT-1 UNDERSTANDING BIG DATA</b>			
Introduction to big data – convergence of key trends – unstructured data – industry Examples of big data – web analytics – big data applications – big data technologies – introduction to Hadoop – open source technologies – cloud and big data – mobile business intelligence – Crowd sourcing analytics inter and trans firewall analytics.			
<b>PART – A</b>			
<b>Q. No</b>	<b>Question</b>	<b>Level</b>	<b>Competence</b>
1	<b>Define</b> Big Data?	BTL 1	Remember
2	<b>Compare</b> Big Data and Conventional Data.	BTL 2	Understand
3	<b>List</b> the various dimensions of growth of Big Data.	BTL 1	Remember
4	<b>What</b> is unstructured data?	BTL 1	Remember
5	<b>Define</b> web analytics.	BTL 1	Remember
6	<b>List</b> any two key trends that led to the emergence of Big Data	BTL 1	Remember
7	<b>Mention</b> two industries using Big Data.	BTL 1	Remember
8	<b>Describe</b> the term "convergence of key trends" in Big Data.	BTL 2	Understand
9	<b>Name</b> any two Big Data technologies.	BTL 1	Remember
10	<b>Describe</b> the role of web analytics in Big Data applications.	BTL 2	Understand
11	<b>State</b> the purpose of Hadoop.	BTL 1	Remember
12	<b>Compare</b> between structured and unstructured data.	BTL 2	Understand
13	<b>State</b> how cloud computing is used to manage Big Data.	BTL 1	Remember
14	<b>Outline</b> the benefits of using open-source technologies in Big Data.	BTL 2	Understand
15	<b>Describe</b> the usage of mobile business.	BTL 2	Understand
16	<b>Describe</b> the different applications of Big Data	BTL 2	Understand
17	<b>Describe</b> the concept of crowdsourcing analytics.	BTL 2	Understand
18	<b>Classify</b> the role of cloud computing Big Data application	BTL 2	Understand
19	<b>Identify</b> scenarios where inter-firewall analytics is essential.	BTL 3	Apply
20	<b>What</b> is the use of mobile business intelligence in decision-making.	BTL 1	Analyze

21	<b>Define</b> Cloud and Big Data Analytics.	BTL 1	Remember	
22	<b>Describe</b> about HDFS	BTL 2	Understand	
23	<b>State</b> the function of MapReduce	BTL 1	Remember	
24	<b>List</b> the sources of Big Data.	BTL 1	Remember	
<b>PART-B</b>				
Q.No.	Question	Marks	Level	Competence
1	<b>Examine</b> the convergence of key trends that led to the evolution of Big Data technologies.	16	BTL 4	Analyze
2	<b>Examine</b> the characteristics of Big Data and the key trends that have contributed to its evolution	16	BTL 4	Analyze
3(a)	<b>a. Analyze</b> the differences between structured and unstructured data with examples.	8	BTL 4	Analyze
3(b)	<b>Examine</b> a solution to manage unstructured data in a social media platform.	8	BTL 4	Analyze
4	<b>Compare</b> traditional database systems and Big Data technologies in terms of scalability, cost, and efficiency	16	BTL 4	Analyze
5(a)	<b>Identify</b> the role of web analytics	8	BTL 3	Apply
5(b)	<b>Apply</b> the effectiveness of web analytics tools	8	BTL 3	Apply
6	<b>Explain</b> the role of Big Data in business transformation. Illustrate with industry examples.	16	BTL 4	Apply
7	<b>Identify</b> how Big Data is used in the healthcare industry.	16	BTL 3	Apply
8	What are the challenges in analyzing Big Data? How do modern tools help overcome them?	16	BTL 4	Analyze
9(a)	<b>Compare</b> and contrast Hadoop and Spark.	8	BTL 3	Apply
9(b)	<b>Compare</b> the features of Cloud and Big Data	8	BTL 4	Analyze
10(a)	<b>Analyze</b> Applications of Big Data in Social and Affiliate Marketing	8	BTL 4	Analyze
10(b)	<b>Develop</b> a Big Data solution for real-time fraud detection in banking using open-source tools.	8	BTL 5	Evaluate
11	<b>Identify</b> the implication of crowdsourcing analytics with real-world examples	16	BTL 3	Apply
12(a)	<b>Analyze</b> the key components of Hadoop with diagrammatic representation of the Hadoop Distributed File System (HDFS)	8	BTL 4	Analyze
12(b)	<b>Construct</b> about MapReduce	8	BTL 3	Apply
13	<b>Build</b> open-source technologies in Big Data and describe their functionalities.	16	BTL 3	Apply
14	<b>Analyze</b> how cloud platforms enable scalability and flexibility in Big Data solutions	16	BTL 4	Analyze
15	<b>Analyse</b> the benefits and limitations of crowdsourcing in data collection and analysis.	16)	BTL 4	Analyze

16(a)	<b>Analyze</b> mobile business intelligence	8	BTL 4	Analyze
16(b)	<b>Discover</b> key features of mobile business intelligence	8	BTL 4	Analyze
17(a)	<b>Identify</b> the significance of inter-firewall analytics	8	BTL 3	Apply
17(b)	<b>Choose</b> the Advantages of inter-firewall and trans-firewall	8	BTL 3	Apply

## UNIT-2 NOSQL DATA MANAGEMENT

Introduction to NoSQL – Aggregate data models – Key-value and document data models – Relationships graph databases – Schemeless databases – Materialized views – Distribution models – Master-Slave Replication – Consistency – Cassandra – Cassandra data model – Cassandra examples – Cassandra clients.

### PART – A

Q. No	Question	Level	Competence
1	<b>List</b> the primary characteristics of NoSQL databases	BTL 1	Remember
2	<b>Define</b> NoSQL and its significance in modern databases	BTL 1	Remember
3	<b>Identify</b> two advantages of NoSQL over relational databases	BTL 2	Understand
4	<b>Compare</b> SQL and NoSQL databases.	BTL 2	Understand
5	<b>Describe</b> aggregate data models in NoSQL	BTL 2	Understand
6	<b>Give</b> examples of two aggregate data models.	BTL 1	Remember
7	<b>Identify</b> the advantages of using aggregate data models.	BTL 2	Understand
8	<b>Define</b> the key-value data model.	BTL 1	Remember
9	<b>Mention</b> any two examples of document-based NoSQL databases.	BTL 2	Understand
10	<b>Differentiate</b> between relational and non-relational databases with examples	BTL 2	Understand
11	<b>Describe</b> graph databases.	BTL 2	Understand
12	<b>Define</b> a scenario where graph databases are ideal for use.	BTL 1	Remember
13	<b>Define</b> a schemeless database.	BTL 1	Remember
14	<b>State</b> two benefits of schemeless databases.	BTL 1	Remember
15	<b>Define</b> materialized views.	BTL 1	Remember
16	<b>Describe</b> two advantages of using materialized views.	BTL 2	Understand
17	<b>Compare</b> materialized views with regular database views.	BTL 2	Understand
18	<b>Define</b> the term aggregate data models in NoSQL databases.	BTL 1	Remember
19	<b>Classify</b> the three types of aggregate data models used in NoSQL	BTL 2	Remember
20	<b>Describe</b> master-slave replication.	BTL 2	Understand
21	<b>What</b> are the two advantages of master-slave replication	BTL 1	Remember
22	<b>Describe</b> the Cassandra data model.	BTL 2	Understand
23	<b>What is</b> the significance of a Cassandra data model	BTL 1	Remember

24	Show the use of Cassandra for large-scale applications.	BTL 1	Remember	
<b>PART-B</b>				
<b>Q.No.</b>	<b>Question</b>	<b>Marks</b>	<b>Level</b>	<b>Competence</b>
1	<b>Examine</b> the characteristics and significance of NoSQL databases	16	BTL 4	Analyze
2(a)	<b>Illustrate</b> the differences between relational databases and NoSQL databases with examples.	8	BTL 3	Apply
2(b)	<b>Analyze</b> the role of NoSQL in handling unstructured and semi-structured data.	8	BTL 4	Analyze
3	<b>Organize</b> the NoSQL databases and explain their core features.	16	BTL 3	Apply
4	<b>Summarize</b> the implementation of aggregate data models with real-world examples.	16	BTL 4	Analyze
5	<b>Illustrate</b> how graph databases help in modeling relationships.	16	BTL 3	Apply
6(a)	<b>Identify</b> the key-value data model.	8	BTL 3	Apply
6(b)	<b>Organize</b> the document data model.	8	BTL 3	Apply
7(a)	<b>Compare</b> the key-value and document data models	8	BTL 4	Analyze
7(b)	<b>Examine</b> the graph data model.	8	BTL 4	Analyze
8	<b>Examine</b> how graph databases manage complex relationships with examples.	16	BTL 4	Analyze
9(a)	<b>Analyse</b> the use of graph databases in social media applications	10	BTL 3	Apply
9(b)	<b>Evaluate</b> the advantages and limitations of graph databases	6	BTL 4	Analyze
10	<b>Classify</b> the concept of master-slave replication in NoSQL databases.	16	BTL 4	Analyze
11	<b>Investigate</b> the schemeless databases and state their key benefits.	16	BTL 4	Analyze
12(a)	<b>Examine</b> how schemeless databases adapt to rapidly changing data structures	8	BTL 4	Analyze
12(b)	<b>Compare</b> master-slave replication with peer-to-peer replication models.	8	BTL 4	Analyze
13(a)	<b>Compare</b> about Consistency and Read Consistency	8	BTL 4	Analyze
13(b)	<b>Examine</b> Replication consistency with an Example Diagram	8	BTL 4	Analyze
14	<b>Classify</b> materialized views and analyze their role in query performance optimization.	16	BTL 4	Analyze

15	<b>Analyze</b> consistency, availability, and partition tolerance in Cassandra's architecture.	16	BTL 4	Analyze
16(a)	<b>Analyze</b> the structure and purpose of Cassandra's data model (keyspace, table, partition key, etc.)	6	BTL 3	Apply
16(b)	<b>Design</b> a Cassandra schema for an e-commerce application..	10	BTL 5	Create
17	<b>Examine</b> the scalability and fault tolerance of Cassandra in large-scale applications.	16	BTL 4	Analyze

### UNIT-3 MAP REDUCE APPLICATIONS

MapReduce workflows – unit tests with MRUnit – test data and local tests – anatomy of Map Reduce job run – classic Map-reduce – YARN – failures in classic Map-reduce and YARN – job scheduling – shuffle and sort – task execution – MapReduce types – input formats – output formats.

#### PART – A

Q. No	Question	Level	Competence
1	<b>Define</b> MapReduce.	BTL 1	Remember
2	<b>Infer</b> the primary phases of a MapReduce workflow.	BTL 2	Understand
3	<b>Explain</b> the role of the Mapper function in a MapReduce.	BTL 2	Understand
4	<b>Identify</b> the role of the Reducer function in MapReduce.	BTL 1	Remember
5	<b>Define</b> MRUnit and its purpose.	BTL 1	Remember
6	<b>List</b> the benefits of using MRUnit for unit testing MapReduce jobs	BTL 1	Remember
7	<b>Explain</b> the importance of unit testing in MapReduce workflows.	BTL 2	Understand
8	<b>Compare</b> the advantages of MRUnit over manual testing	BTL 2	Understand
9	<b>Define</b> the anatomy of a MapReduce job run	BTL 1	Remember
10	<b>List</b> the key components involved in a MapReduce job run.	BTL 1	Remember
11	<b>Explain</b> the lifecycle of a MapReduce job run.	BTL 2	Understand
12	<b>Define</b> YARN and its purpose.	BTL 1	Remember
13	<b>Illustrate</b> the architecture of YARN with a diagram.	BTL 2	Understand
14	<b>Compare</b> Classic MapReduce and YARN.	BTL 2	Understand
15	What are the common failures in Classic MapReduce and how does YARN handle them?	BTL 2	Understand
16	<b>Define</b> job scheduling in MapReduce.	BTL 1	Remember

17	<b>List</b> different job scheduling algorithms used in MapReduce.	BTL 1	Remember	
18	<b>What</b> is the purpose of the shuffle and sort phase?	BTL 1	Remember	
19	<b>Explain</b> how sorting is performed in MapReduce.	BTL 2	Understand	
20	<b>Define</b> task execution in MapReduce	BTL 1	Remember	
21	<b>Illustrate</b> the role of task trackers in Classic MapReduce	BTL 2	Understand	
22	<b>List</b> the Phases of Data Flow in HADOOP.	BTL 2	Understand	
23	<b>Define</b> output formats in MapReduce and their significance	BTL 1	Remember	
24	<b>Illustrate</b> how to implement a custom output format.	BTL 2	Understand	
<b>PART-B</b>				
Q.No.	Question	Marks	Level	Competence
1	<b>Construct</b> the architecture of the MapReduce framework in Hadoop	16	BTL 3	Apply
2	<b>Illustrate</b> the phases of a MapReduce job, focusing on the roles of mappers and reducers	16	BTL 3	Apply
3(a)	<b>Choose</b> the significance of the shuffle and sort phases in the MapReduce workflow.	8	BTL 3	Apply
3(b)	<b>Compare</b> MRUnit testing with traditional testing methods for MapReduce.	8	BTL 3	Apply
4	<b>Examine</b> the importance of unit testing in MapReduce workflows with MRUnit.	16	BTL 4	Analyze
5	<b>Evaluate</b> the process of writing MRUnit test cases for a word count MapReduce program.	16	BTL 4	Analyze
6	<b>Differentiate</b> the benefits and limitations of using MRUnit for validating MapReduce jobs.	16	BTL 4	Analyze
7	<b>Examine</b> a test plan for a MapReduce application using MRUnit.	16	BTL 3	Apply
8	<b>Develop</b> the anatomy of a MapReduce job run with detailed steps and a diagram	16	BTL 3	Apply
9	<b>Differentiate</b> the job execution flow in classic MapReduce and YARN.	16	BTL 3	Apply
10(a)	<b>Classify</b> the key features of the classic MapReduce architecture.	8	BTL 4	Analyze
10(b)	<b>Examine</b> the advantages of YARN over classic MapReduce in handling failures	8	BTL 4	Analyze
11(a)	<b>Investigate</b> the fault-tolerance mechanisms implemented in YARN	8	BTL 4	Analyze
11(b)	<b>Differentiate</b> the handling of node failures in classic MapReduce and YARN.	8	BTL 4	Analyze
12	<b>Differentiate</b> between the roles of NodeManager and ResourceManager in YARN.	16	BTL 3	Apply

13(a)	<b>Analyze</b> the impact of poor scheduling on the performance of MapReduce jobs.	16	BTL 4	Analyze
13(b)	<b>Summarize</b> the enhancements to the job scheduling mechanism in YARN to improve efficiency.	8	BTL 3	Apply
14	<b>Solve</b> the shuffle and sort phases in MapReduce with an example.	8	BTL 3	Apply
15	<b>Examine</b> the challenges in implementing the shuffle and sort operations efficiently.	16	BTL 4	Analyze
16	<b>Analyze</b> the challenges in monitoring and debugging a MapReduce job run.	16	BTL 4	Analyze
17	<b>Examine</b> the role of the Fair Scheduler in YARN with practical examples.	16	BTL 4	Analyze

#### UNIT-4 BASICS OF HADOOP

Data format – analyzing data with Hadoop – scaling out – Hadoop streaming – Hadoop pipes design of Hadoop distributed file system (HDFS) – HDFS concepts – Java interface – data flow – Hadoop I/O – data integrity – compression – serialization – Avro – file- based data structures – Cassandra – Hadoop integration.

#### PART – A

Q. No	Question	Level	Competence
1	<b>Define</b> Hadoop and its primary use.	BTL 1	Remember
2	<b>Name</b> two compression formats used in Hadoop.	BTL 2	Understand
3	<b>Define</b> serialization in Hadoop.	BTL 1	Remember
4	<b>State</b> the function of Avro in Hadoop?	BTL 2	Understand
5	<b>Show</b> the Cassandra in the context of big data?	BTL 2	Understand
6	<b>Define</b> data compression in Hadoop I/O.	BTL 1	Remember
7	<b>Define</b> the concept of scaling out in Hadoop.	BTL 1	Remember
8	<b>Summarize</b> the design principles of HDFS.	BTL 2	Understand
9	<b>State</b> the data integrity important in Hadoop I/O?	BTL 1	Remember
10	<b>Explain</b> how Hadoop integrates with Cassandra.	BTL 2	Understand
11	<b>Explain</b> the concept of data flow in Hadoop systems.	BTL 2	Understand
12	<b>What</b> is the purpose of file-based data structures in Hadoop?	BTL 2	Understand
13	<b>Outline</b> Avro serialization for a given data set.	BTL 2	Understand
14	<b>Define</b> the data integrity in HDFS?	BTL 1	Remember
15	<b>Interpret</b> how Cassandra managing a large-scale distributed database.	BTL 2	Understand
16	<b>Classify</b> Hadoop I/O operations for handling unstructured data.	BTL 2	Understand
17	<b>Discuss</b> the role of Hadoop Pipes and how they differ from Hadoop Streaming.	BTL 2	Understand
18	<b>Compare</b> between HDFS and traditional file systems.	BTL 2	Understand

19	<b>Break down</b> the data flow process in HDFS.	BTL 1	Remember	
20	<b>List</b> the challenges in integrating Hadoop with Cassandra?	BTL 1	Remember	
21	<b>Define</b> Avro with other file-based data structures in Hadoop.	BTL 1	Remember	
22	<b>How</b> the performance of Hadoop I/O when handling large datasets.	BTL 1	Remember	
23	<b>Tell</b> the pros and cons of using the Java interface for HDFS operations.	BTL 1	Remember	
24	<b>Describe</b> the significance of the Java interface in HDFS.	BTL 2	Understand	
<b>PART-B</b>				
<b>Q.No.</b>	<b>Question</b>	<b>Marks</b>	<b>Level</b>	<b>Competence</b>
1(a)	<b>Applty</b> the concept of data flow in Hadoop.	8	BTL 3	Apply
1(b)	<b>Identify</b> the features of the Hadoop Distributed File System (HDFS).	8	BTL 3	Apply
2	<b>Examine</b> the primary components of Hadoop architecture.	16	BTL 4	Analyze
3	<b>Investigate</b> the Hadoop pipes, and how are they used?	16	BTL 4	Analyze
4	<b>Break Down</b> the complete details of Avro, and why is it used in Hadoop?	16	BTL 4	Analyze
5(a)	<b>Compare</b> Hadoop Streaming and Hadoop Pipes in terms of design and functionality.	8	BTL 4	Analyze
5(b)	Use the Java API to read and write a file in HDFS.	8	BTL 3	Apply
6	<b>Demonstrate</b> how to integrate Cassandra with Hadoop for querying large datasets.	16	BTL 3	Apply
7	<b>Analyze</b> the process of Compression, Serialization and its importance in Hadoop.	16	BTL 4	Analyze
8	<b>Classify</b> Avro for data serialization in a Hadoop-based system	16	BTL 4	Analyze
9(a)	<b>Compare</b> JSON, Avro, and Parquet data formats.	8	BTL 4	Analyze
9(b)	<b>Identify</b> the advantages and disadvantages of using Avro in Hadoop.	8	BTL 3	Apply
10	<b>Analyze</b> how scaling out in Hadoop differs from scaling up in traditional systems.	16	BTL 4	Analyze
11	<b>Break Down</b> the design of Hadoop's Distributed File System (HDFS).	16	BTL 4	Analyze
12	<b>Examine</b> the process of serialization and its importance in Hadoop.	16	BTL 4	Analyze
13(a)	<b>Differentiate</b> between serialization and deserialization in Hadoop I/O.	8	BTL 4	Analyze
13(b)	<b>Break down</b> the integration process of Cassandra with Hadoop.	8	BTL 4	Analyze
14	<b>Develop</b> a MapReduce workflow to process Avro-encoded input and output compressed data.	16	BTL 6	Create

15	<b>Examine</b> the MapReduce program to analyze a dataset using Hadoop.	16	BTL 4	Analyze
16(a)	<b>Build</b> the implications of using Avro over other serialization frameworks.	8	BTL 3	Apply
16(b)	<b>Analyze</b> the role of file-based data structures in Hadoop.	8	BTL 4	Analyze
17	Apply HDFS concepts to design a storage system for large-scale data.	16	BTL 3	Apply

### UNIT-5 HADOOP RELATED TOOLS

Hbase – data model and implementations – Hbase clients – Hbase examples – praxis. Pig – Grunt – pig data model – Pig Latin – developing and testing Pig Latin scripts. Hive – data types and file formats – HiveQL data definition – HiveQL data manipulation– HiveQL queries.

#### PART – A

Q. No	Question	Level	Competence
1	<b>Define</b> what HBase is and explain how it differs from relational databases.	BTL 1	Remember
2	<b>Differentiate</b> HBase and traditional relational databases.	BTL 2	Understand
3	<b>List</b> the key features of the HBase data model.	BTL 1	Remember
4	<b>Illustrate</b> the key features of the HBase data model with examples.	BTL 2	Understand
5	<b>What</b> is the major the role of HBase clients in data access.	BTL 1	Remember
6	<b>Summarize</b> the function of HBase clients in facilitating database access.	BTL 2	Understand
7	<b>Define</b> Praxis in the context of HBase.	BTL 1	Remember
8	<b>Describe</b> the Pig data model with an example.	BTL 2	Understand
9	<b>What</b> is Pig in the Hadoop ecosystem.	BTL 1	Remember
10	<b>Outline</b> the role of Pig in the Hadoop ecosystem and its applications.	BTL 2	Understand
11	<b>State</b> the purpose of Grunt in Pig.	BTL 1	Remember
12	<b>Demonstrate</b> how Grunt is used in Pig scripting.	BTL 2	Understand
13	<b>Define</b> Pig Latin and mention its primary use.	BTL 1	Remember
14	<b>Clarify</b> the purpose and primary use of Pig Latin in data processing.	BTL 2	Understand
15	<b>List</b> the common data types available in Hive.	BTL 1	Remember
16	<b>Compare</b> the common data types in Hive with examples of their use.	BTL 2	Understand
17	<b>Recall</b> the default file format used in Hive.	BTL 1	Remember
18	<b>Classify</b> why the default file format in Hive is significant for data storage.	BTL 2	Understand
19	<b>Define</b> how HBase clients interact with the database.	BTL 1	Remember
20	<b>Infer</b> the interaction process of HBase clients with the database.	BTL 2	Understand
21	<b>List</b> the components of the Pig data model used in data processing.	BTL 1	Remember

22	<b>Classify</b> how the Pig data model contributes to effective data processing.	BTL 2	Understand	
23	<b>State</b> the importance of Grunt in Pig scripting.	BTL 1	Remember	
24	<b>Summarize</b> the importance of Grunt as a tool in scripting with Pig.	BTL 2	Understand	
<b>PART – B</b>				
Q. No	Question	Marks	Level	Competence
1	<b>Construct</b> how to set up an HBase database with a basic schema and perform data insertion using HBase clients.	16	BTL 3	Apply
2	<b>Develop</b> a Pig Latin script to analyze and filter large datasets based on a specific condition.	16	BTL 3	Apply
3	<b>Analyze</b> how HBase handles read/write operations differently from RDBMS.	16	BTL 4	Analyze
4(a)	<b>Examine</b> a Hive table with appropriate data types and file formats for storing IoT sensor data.	8	BTL 4	Analyze
4(b)	<b>Analyze</b> a HiveQL query to filter and extract data from a partitioned table.	8	BTL 4	Analyze
5	<b>Develop</b> a workflow using HiveQL to create, insert, and query a Hive table for e-commerce sales data	16	BTL 3	Apply
6(a)	<b>Analyze</b> how Pig Latin's data model accommodates both structured and unstructured data in workflows.	8	BTL 4	Analyze
6(b)	<b>Compare</b> the performance of Grunt and HiveCLI for managing big data workflows.	8	BTL 4	Analyze
7	<b>Construct</b> a HiveQL query to transform unstructured log data into a structured format and analyze error trends.	16	BTL 3	Apply
8(a)	<b>Identify</b> how the choice of data types in Hive affects storage and computation efficiency.	8	BTL 3	Apply
8(b)	<b>Analyze</b> the differences in data manipulation techniques between HiveQL and Pig Latin.	8	BTL 4	Analyze
9	<b>Apply</b> the concept of Praxis in HBase to optimize database read and write operations for a banking application.	16	BTL 3	Apply
10(a)	<b>Analyze</b> the effectiveness of Praxis in real-world HBase applications, particularly in high-volume data processing.	8	BTL 4	Analyze
10(b)	<b>Examine</b> the performance implications of using nested data structures in the Pig data model.	8	BTL 4	Analyze
11	<b>Create</b> a Hive table for a retail dataset and write complex queries on customer behavior.	16	BTL 6	Create
12	<b>Develop</b> a Pig Latin script to group and sort data by a specified attribute.	16	BTL 3	Apply
13	<b>Develop</b> and execute a Pig Latin script for performing a word count operation on large datasets.	16	BTL 3	Apply
14(a)	<b>Analyze</b> the differences between the HBase data model and traditional relational database models in practical scenarios.	8	BTL 4	Analyze
14(b)	<b>Examine</b> the scalability of HBase for storing and retrieving time-series data in a distributed environment.	8	BTL 4	Analyze
15	<b>Compare</b> and contrast the implementation of joins in Pig Latin and HiveQL with examples.	16	BTL 4	Analyze

16(a)	<b>Identify</b> the role of Grunt in enhancing the development and debugging of Pig Latin scripts.	8	BTL 3	Apply
16(b)	<b>Analyze</b> how Pig Latin scripts handle large-scale data processing compared to HiveQL queries.	8	BTL 4	Analyze
17	<b>Classify</b> the advantages and limitations of using HiveQL for handling structured and unstructured data	16	BTL 4	Analyze