

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

III-B.TECH-II-Semester End Examinations (Supply) - December- 2025
DATA ENGINEERING
(CSD)

[Time: 3 Hours]

[Max. Marks: 60]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 10 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(10 Marks)

1. a)	Differentiate between OLTP and OLAP databases.	[1M]
b)	What is the role of a Data Engineer?	[1M]
c)	Define the 4Vs of Big Data.	[1M]
d)	List any three AWS tools used in the ETL process.	[1M]
e)	What is the role of Kubernetes in container orchestration?	[1M]
f)	State any two components of the Hadoop ecosystem.	[1M]
g)	Mention the key difference between Hive and Impala.	[1M]
h)	What is the role of MapReduce in Spark architecture?	[1M]
i)	What is the purpose of Business Intelligence (BI) tools like Power BI in real-time analytics?	[1M]
j)	List any two BI tools and their purpose.	[1M]

PART-B

(50 Marks)

2.a)	Design a normalized table for an e-commerce app with customer, product, and order details.	[5M]
b)	Explain with an example how a Star schema is implemented from a normalized table.	[5M]

OR

3.	Analyze OLTP and OLAP architectures with business use case examples and performance metrics.	[10M]
4.a)	Illustrate the architecture of a data warehouse.	[5M]
b)	Write about Data Lakes in detail.	[5M]

OR

5.	Explain the ETL process with an example.	[10M]
6.a)	Discuss the role of Docker in microservices-based data architecture.	[5M]
b)	Explain REST API design with examples.	[5M]

OR

7.	Compare Hadoop and Docker-based architectures in large-scale data systems.	[10M]
8.a)	Write a Spark program in Python using the DataFrame API to filter customers with >500 orders.	[5M]
b)	Explain Spark SQL and its advantages.	[5M]

OR

9.	Differentiate between NoSQL Document Store and Key-Value Stores with examples.	[10M]
10.a)	Explain Lambda vs Kappa Architecture.	[5M]
b)	Write about mobile APIs.	[5M]

OR

11.	Write in detail about Tableau and Power BI.	[10M]
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