GUJARAT TECHNOLOGICAL UNIVERSITY
MBA - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: MB03092151   **Date: 20-12-2025**

Subject Name: Advanced Data Analytics

Time: 10:30 AM TO 01:30 PM   **Total Marks: 70**

Instructions
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. USE of SIMPLE calculators AND non-programmable scientific calculators are permitted.

		Marks
Q.1	ALL 7 Questions must be Compulsory.	**14**
(a)	What is Data analytics?	
(b)	What is the objective of Supply Chain Optimization?	
(c)	What does Cash Flow Analytics help determine?	
(d)	What does Customer Lifetime Value (CLV) indicate?	
(e)	Mention two applications of analytics in Marketing and Finance function.	
(f)	What is Big Data Analytics?	
(g)	Give names of some common tools used in Marketing Analytics.	
Q.2 (a)	Explain how analytics is applied in various business functions.	**07**
(b)	Describe the concept of Big Data Analytics and its key characteristics.	**07**

OR

(b)	Illustrate with an example how Inventory Optimization can be implemented using data analytics.	**07**
Q.3 (a)	Explain Key Areas of Financial Analytics in Business.	**07**
(b)	A financial analyst is tasked to improve the company's budgeting accuracy using analytics. Design an approach for implementing Financial Analytics in the budgeting process.	**07**

OR

(a)	Discuss about important HR Metrics which you would like to measure and monitor.	**07**
(b)	What are the changing needs in HR Analytics in modern times.	**07**
Q.4 (a)	Explain the Key Components of Marketing Analytics.	**07**
(b)	Your company is having its own You Tube channel where it uploads products demo, review and other advertisement videos. Explain which metrics you would like to measure and analyse for your channel	**07**

OR

(a) Explain the concept and process of Market Segmentation using analytics. **07**

(b) Explain Various ethical issue in implementation of HR analytics. **07**

Q.5 Orinova Textiles Ltd., a leading manufacturer of sustainable fabrics, faced a sharp decline in net profit margins despite growing sales volumes. The leadership suspected that fragmented data systems across HR, supply chain, and customer management were limiting visibility into cost drivers and profitability metrics. To address these gaps, Orinova launched Project Synapse, an organization-wide data analytics initiative integrating a Human Resource Information System (HRIS) with financial, operational, and customer data platforms.

1. HRIS and Workforce Optimization: Before the project, HR maintained separate databases for payroll, training, and performance tracking. Through HRIS implementation, Orinova unified these datasets, enabling analytics on employee productivity, overtime costs, and absenteeism trends. The analytics team found that units with higher employee engagement scores had 18% higher productivity and 12% lower rework costs. Predictive models were developed to flag departments at risk of high turnover, supporting proactive workforce planning.

2. Supply Chain and Operational Analytics: The operations division applied machine learning models to historical production data to identify inefficiencies. Analysis revealed that unplanned machine downtime and excess raw material inventory accounted for nearly 25% of total operational cost variance. Integrating supplier lead-time data into forecasting algorithms improved procurement accuracy and reduced working capital lock-in.

3. Customer and Profitability Analytics: Customer churn analytics identified that small retail clients, who represented 40% of the customer base but only 18% of revenue, had the highest churn rates. Meanwhile, large institutional clients were profitable but increasingly demanding faster delivery and customization. By linking CRM, logistics, and cost data, Orinova developed a customer profitability model using contribution margin and lifetime value metrics. This helped prioritize high-value clients and redesign service levels for different customer segments.

4. Profitability Dashboard and Executive Insights: The analytics team built an integrated profitability dashboard combining HR efficiency, supply chain cost savings, and customer lifetime value. Through advanced visualization tools, management could simulate how improvements in employee retention or production uptime directly impacted net profit margins.

Within six months, Orinova achieved a 7% improvement in operating margins, driven by better workforce utilization, optimized inventory, and targeted customer retention efforts.

(a) Design a HR Dashboard for Orinova to monitor the employee demographics, performance, absenteeism, Overtime, Training & development costs, etc. **07**

(b) How can supply chain analytics directly contribute to profitability improvement? **07**

OR

(a) What are the benefits that Orinova would gain from HRIS? **07**

(b) What profitability metrics should be used to evaluate customer segments? **07**

***