Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: Socia, Web, Mobile Analytics **Semester: 6**

Program: B.Tech CSE (DataScience) **Time : 03 hrs.**

Course Code: CSBA3011 **Max. Marks:100**

Instructions: Read the questions carefully. Support your answers with suitable examples.

SECTION A

(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	A marketing team sends out 8,000 emails as part of a campaign. Out of these, 1,600 unique recipients open the email. Find the open rate for this campaign.	**4**	**CO3**
Q2	Differentiate between mobile analytics and web analytics by highlighting any two key differences.	**4**	**CO1**
Q 3	Define screen resolution, and exaplain how does it impact mobile user experience. Give examples of common screen resolutions.	**4**	**CO3**
Q4	Explain a click-path report in mobile analytics. Describe how it helps understand user navigation.	**4**	**CO4**
Q5	List and explain any two key drivers behind the growth of mobile e-commerce.	**4**	**CO2**
SECTION B **(4Qx10M= 40 Marks)**			
Q6	A mobile finance app reports the following metrics: • Daily Active Users (DAU): 20,000 • Average Revenue Per User (ARPU): $1.50 • Average Revenue Per Paying User (ARPPU): $7.50 Calculate the percentage of paying users in the app.	**10**	**CO4**
Q7	A retail app runs a mobile push notification campaign promoting a limited-time discount. • Total users who received push notification: **60,000** • Click-through rate (CTR): **8%** • Conversion rate after click: **25%** • Average order value (AOV): **$40**	**10**	**CO3**

	• Campaign cost: **$5,000** 1. Calculate the number of users who clicked the notification. 2. Calculate the number of users who made a purchase. 3. Calculate total revenue from the campaign. 4. Determine the Return on Investment (ROI).		
Q8	A new e-commerce startup selling eco-friendly products has the following funnel metrics: Top of the Funnel (TOFU): 50,000 website visitors/month Middle of the Funnel (MOFU): 10,000 add items to cart Bottom of the Funnel (BOFU): 2,000 complete purchases Retention Rate: 30% Customer Acquisition Cost (CAC): $25 Average Deal Size: $50 Calculate the conversion rates for each funnel stage (TOFU → MOFU → BOFU). Show your calculations. The CEO wants to improve the BOFU conversion rate by 50%. Propose two specific strategies (e.g., abandoned cart emails, limited-time discounts) and explain how each would address the current funnel bottlenecks. If the startup increases its retention rate to 45%, how would this impact Customer Lifetime Value (LTV)? Assume customers make 3 repeat purchases on average. Show your calculations.	**10**	**CO3**
Q9	A fitness app notices declining daily active users and short session durations. The team suspects that users aren't finding the app engaging enough. How can mobile app analytics and customer-centric approaches help the team diagnose the issue and improve user engagement? Mention the KPIs that can be tracked and analyzed for the same. OR Discuss any 5 popular KPIs for email marketing. Explain how these KPIs are calculated.	**10**	**CO5**
SECTION-C (2Qx20M=40 Marks)			
Q10	Explain how a directed graph can be used to analyze social media interactions such as retweets. Describe how in-degree centrality helps identify influential users. Write pseudocode or explain the logic for	**20**	**CO4**

	building such a graph using Python. Discuss potential real-world uses of this approach.		
Q11	Describe the end-to-end process of Twitter sentiment classification using a Naïve Bayes classifier in Python. Explain the purpose of each component in the pipeline: text preprocessing, CountVectorizer, TfidfTransformer, and MultinomialNB. How does accuracy evaluation help in validating the model? OR You are a data analyst at LinkedIn. Your team needs to simulate a dataset to study post engagement trends. The dataset must include: Post IDs Random users (20 unique users) Post dates (within the past year) Likes (10–500), Shares (5–200), Comments (3–100) Impressions (500–5000) Write pseudocode to generate this dataset (similar to generate_linkedin_dataset()). Explain why Total_Engagement = Likes + Shares + Comments is a valid metric for influencer ranking. If impressions were included in the engagement score, how might this change the top influencers?	**20**	**CO4**