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| **C:\Users\ADMIN\Desktop\j.png** | **JAIPURIA INSTITUE OF MANAGEMENT, INDORE**  **Post Graduate Diploma in Management** |
| **Course Title: Python for Business Analytics (Course Code: 40822)**  **End-Term Examination, Term - III (April, 2024)** | |
| **Time Duration: 2 Hours Total Marks: 40** | |

***General Instructions*:**

1. *All the questions have to be answered in the Jupyter Notebook.*
2. *Please write the analysis in the markdown or as a comment in the Jupyter Notebook only.*
3. *Please download the file as a Jupyter Notebook file (.ipynb extension) and save it with your full name and the last four digits of your enrollment number.*
4. *Do not write on the question paper except your roll number.*
5. *Use the retail.xlsx and transactions.xlsx files.*

**SECTION – A**

**Q1.** HR Manager regularly takes employee feedback on different management processes on a scale of 1 to 10, where 1 means least satisfied and 10 means most satisfied. He uses this practice to assess employee satisfaction levels and enhance the organization's HR policies. This lets him obtain valuable insights into employee satisfaction levels, enabling you to make informed decisions and improvements to ensure a positive organizational environment. Based on the average satisfaction score, if the score is above 8, it shows that the employees are highly satisfied; if more than or equal to 5 up to 7, they are moderately satisfied, and if less than 5 are not satisfied. He has designed a tool that could be shared with the organizations so they can also find out about their employee satisfaction level. Create a function that will give information about the employee satisfaction level, and this will help the organizations to design the employee brand ambassador program with the set of highly satisfied employees, a free goodies distribution drive with moderately satisfied employees, and one-on-one sessions with not satisfied employees to know the reason of their dissatisfaction. *Note: Please give the function's name (emp\_Sat); no marks will be given if any student has done this question without the function.* ***(8 marks)***

**Q2.** You are a data analyst at a retail company that sells various products. You have been provided with a dataset containing information about customer transactions. The dataset includes TransactionID, Date, Gender, Age, Product Category, Quantity, Price Per Unit, and Total Amount. You must analyze the dataset to provide meaningful insights to guide business decisions. (*Use retail.xlsx)* ***(12 marks)***

1. Explore the distribution of customers by age and gender. Identify any notable patterns or trends in customer demographics that could impact marketing strategies.
2. Analyze the sales performance of different Product Categories. Determine which categories contribute the most to overall revenue and which may require additional marketing efforts.
3. Investigate pricing strategies by analyzing the distribution of Price Per Unit across Product Categories. Determine if any pricing trends could be optimized to improve sales.
4. Examine customer behavior based on age groups. Identify whether certain age groups tend to purchase specific Product Categories more frequently and if there are opportunities to target these groups effectively.
5. Calculate the total revenue generated from transactions and analyze the revenue trends over time. Identify high and low sales periods and explore potential reasons for these trends.

**Q3.** Your task as an analyst is to analyze the dataset and create a line plot to visualize the distribution of sales revenue across different Product Categories over time. After creating the chart, answer the following questions based on your observations from the chart. (*Use retail.xlsx)* **(12 marks)**

1. Which Product Category shows the highest sales revenue for the most recent month?
2. Is there a noticeable trend in sales revenue for Product Category B over the observed time period?
3. In which month did Product Category A experience the largest increase in sales revenue?
4. Compare the sales revenue between Product Category A and Product Category C for the first half of the observed time period.
5. Identify any months where all Product Categories experienced a decrease in sales revenue compared to the previous month.

**Q4.** Amazon segments its customers based on age groups to analyze spending patterns of different age groups so they can have a product range focusing on all age groups. Recommend the company to tailor its marketing strategies for different age segments. Compare the purchasing behavior of male and female customers in terms of total spending and purchase frequency. Provide insights into any gender-based trends or preferences that could influence marketing campaigns. *(Use transactions.xlsx*) **(8 marks)**