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MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

Model Question Paper

Third Semester MBA Degree Examination

Foundations of Business Analytics

Time: 3 Hours **Max. Marks: 100**

Note: 1. Answer any FOUR full questions from Q1 to Q7.
2. Question No. 8 is compulsory.
3. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

			M	L	C
Q1	a.	Elaborate on types of business analytics. Give examples.	03	L2	CO1
	b.	You are being hired as a business analyst in an e-commerce company. Identify roles, responsibilities, skills and tools you will use to effectively perform your role.	07	L3	CO1
	c.	Identify the business challenges of a modern-day fashion retailer. Design a business analytics strategy to address these challenges. Suggest the techniques/models to the fashion retailer.	10	L3	CO1
Q2	a.	A sales manager wants to compare the monthly sales performance of three different products across four regions. Recommend type of chart that should be used. Justify your answer.	03	L3	CO2
	b.	Compare and contrast MS Excel, Tableau and Python tools for business analysis. Give your recommendations on how these can be used in manufacturing industry.	07	L3	CO1
	c.	A public sector bank is facing high competition from private sector banks. Identify business analytics techniques and models to effectively address the competition and growth.	10	L3	CO1
Q3	a.	A business analyst needs to compare customer satisfaction ratings (on a scale of 1-10) across five different branches of the company. Recommend type of chart that should be used. Justify your answer.	03	L3	CO2
	b.	A company wants to analyze customer purchase patterns based on location, gender, and age group. Recommend how this can be achieved using Pivot table tool in MS-Excel.	07	L3	CO2
	c.	Summarize various visualization charts available for analysis of business data. Give example where each of the chart is useful.	10	L2	CO2
Q4	a.	Compare Pivot table and Power Pivot. Explain with example.	03	L2	CO2
	b.	Explain a scenario where simple hypothesis testing can be used in business. Explain the terms and how they help make business decisions.	07	L2	CO2
	c.	Pancham products is a well-known company supplying milk and milk products worldwide. You have joined as business analyst in the company. You are given their order data in an Excel which has following columns. Order ID, Customer ID, Qty Shipped, Revenue, Cost, Order Date, Ship Date, Order Status. You are asked to carry out following tasks. Using Power Query tool, list steps to accomplish these tasks.	10	L4	CO3

<table>
<tr><td></td><td></td><td>a. Some of the rows xxxx in the order id. These are not actual sales but they are sample products sent to customer. How will you exclude these rows from sales analysis?
b. Customer Id column is supposed to have only customer id. But it has both customer id and customer name. Split them into two columns. Give appropriate name to two columns.
c. Excel does not have profit column currently. Generate profit column which is Revenue – Cost
d. Change revenue, cost and profit column data type to currency data type.
e. Add one column which just lists the month when product is shipped. This is needed for month-wise analysis of sales data.</td><td></td><td></td><td></td></tr>
<tr><td>Q5</td><td>a.</td><td>Explain the steps to import data from a website using Power Query.</td><td>03</td><td>L2</td><td>CO3</td></tr>
<tr><td></td><td>b.</td><td>Explain different ways to create Data Frame in pandas</td><td>07</td><td>L2</td><td>CO4</td></tr>
<tr><td></td><td>c.</td><td>Develop a python program for the following:

a. Create two series – one to store various product names and other to store corresponding price.
b. Create a dictionary containing ‘Product name’ and “Product price’ as keys. Add the series with some sample values.
c. Create a DataFrame from the above created dictionary of series.
d. Sort the Data Frame based on Product price in ascending order
e. Print Product name having maximum price.</td><td>10</td><td>L3</td><td>CO4</td></tr>
<tr><td>Q6</td><td>a.</td><td>Write a Python program to create a Pandas DataFrame from a CSV file.</td><td>03</td><td>L2</td><td>CO5</td></tr>
<tr><td></td><td>b.</td><td>You are given a Data Frame with customer transactions. Identify how would you group the data by customer and calculate total spending per customer?</td><td>07</td><td>L3</td><td>CO4</td></tr>
<tr><td></td><td>c.</td><td>Consider the table of BIKES given below.

<table><tr><th>Bid</th><th>Bike name</th><th>Brand name</th><th>Biketype</th><th>Cost</th></tr><tr><td>1001</td><td>Dream Racer</td><td>Speedo</td><td>Super</td><td>1980000</td></tr><tr><td>1002</td><td>Splendid</td><td>Indiana</td><td>NULL</td><td>50000</td></tr><tr><td>1003</td><td>Silver Wing</td><td>Indiana</td><td>Touring</td><td>2300000</td></tr><tr><td>1004</td><td>ZZZZ</td><td>WMV</td><td>Sports</td><td>1500000</td></tr><tr><td>1005</td><td>CH2H</td><td>Speedo</td><td>Super</td><td>470000</td></tr><tr><td>1006</td><td>Astor</td><td>Victory</td><td>Normal</td><td>1700000</td></tr><tr><td>1007</td><td>Cloud9</td><td>GEM</td><td>Normal</td><td>1700000</td></tr></table>
Develop SQL queries and give corresponding output for the following:

a. Display Bikenames and their corresponding Brandnames in descending order of cost
b. Display Brandnames of bikes whose Biketype is not known
c. Display all bikes whose cost is between 200000 and 300000
d. Display Bid whose name is “Astor”
e. Find the cheapest bike</td><td>10</td><td>L3</td><td>CO5</td></tr>
<tr><td>Q7</td><td>a.</td><td>Summarize, with example, need for mastering SQL writing skill for business analysts.</td><td>03</td><td>L2</td><td>CO5</td></tr>
<tr><td></td><td>b.</td><td>You are given student data having student number, name, address and total marks. Construct sorting and filtering using Pandas Data Frame for this data.</td><td>07</td><td>L3</td><td>CO4</td></tr>
</table>

	c.	Consider the given SPORTS table. **Sid** | **SName** | **Fees** | **DateofPlay** | **CoachId** 1 | Karate | 1200 | 2024-08-24 | S1 2 | Football | 1800 | 2024-09-13 | S2 3 | Cricket | 1500 | 2024-06-14 | S3 4 | Lawn Tennis | 2500 | 2024-09-25 | S4 5 | Badminton | 1800 | 2024-10-20 | S5 Develop following SQL queries and corresponding outputs: (i) To display Sid and name of those sports which are played in the month of September. (ii) To display all sports names in lower case. (iii) To display sports which has maximum fee. (iv) To sort the sports based on the Date of Play. (v) To display the Coach Id of "Cricket".	10	L3	CO5
Q8		**CASE STUDY (Compulsory)** You are a data analyst at Ratna Retail, and the management has asked you to provide insights into sales trends, city-wise performance, and product category contribution using MS Excel and Python tools. a. (i) Using Pivot Tables in Excel, how would you analyze total sales and profit margins per city and per product category? What insights can be gained from this analysis? (ii) Create a Pivot Chart to visualize sales trends across different cities. Which type of chart would you choose, and why? (iii) Suppose the dataset has missing or duplicate values. Elaborate how you would handle missing sales data and remove duplicates in Excel before further analysis. b. (i) Using Pandas, write a Python script to: • Read the sales dataset into a DataFrame • Compute the total sales per city using groupby() • Sort the results in descending order of sales (ii) Using NumPy and Pandas, explain how you can compute the average units sold per product category and generate descriptive statistics (mean, median, standard deviation) for sales data. (iii) Using Matplotlib, plot a bar chart showing total sales per product category. What key insights can be drawn from this visualization?	10 10	L4 L4	CO2 CO4

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