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	<b>PES University, Bengaluru</b> (Established under Karnataka Act No. 16 of 2013)	<b>UE20CS903</b>
<b>March 2024: END SEMESTER ASSESSMENT (ESA)</b> <b>M TECH DATA SCIENCE AND MACHINE LEARNING_ SEMESTER I</b>  <b>UE20CS903 – Databases &amp; SQL</b>		
Time: 3 Hrs	Answer All Questions	Max Marks: 100

INSTRUCTIONS		
<ul style="list-style-type: none"> <li>• All questions are compulsory.</li> <li>• Section B and C are coding questions which have to be answered in the system and uploaded in Olympus Login.</li> <li>• Section A should be handwritten in the answer script provided and signed at the end of the same.</li> </ul>		
SECTION A – 20 MARKS		
1	a	How to add foreign keys in MySQL?
	b	What are the levels at which check constraints can be created? Justify your answer on what all data types the constraints can be applied.
	c	What is the difference between isnull operator() and ifnull() function?
	d	Is it possible to have two primary keys in a table? Explain what is meant by alternate keys in RDBMS with an example.
	e	What is a view? Mention differences between Simple and Complex view.
2	a	What are the uses of Window Function?
	b	Explain about EXISTS operator
	c	What is percent rank? Explain with an example
	d	State and explain in brief types of Locks in database.
	e	Explain the different ways you can restrict the data in a column. Demonstrate with examples.
SECTION B – 40 MARKS		
3		
	a	Write a query to find total sales for each region and ship mode combination for orders in year 2020

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	b	Write a query to print first name and last name of a customer using orders table(everything after first space can be considered as last name) customer_name, first_name,last_name	5
	c	Find the segments where the total sales exceed the average total sales across all segments.	5
	d	Determine the month with the highest average discount rate	5
	e	Calculate the moving average of sales for each product over a 3-month period	5
	f	Find the best-selling and most profitable category in the given dataset	5
	g	Identify the top 5 most profitable months in terms of total profit	5
	h	Which country sold the most products?	5
	<b>SECTION C – 40 MARKS</b>		
4		<p>Use orders schema for the following queries</p> <ul style="list-style-type: none"> <li>• Customers: stores customer's data.</li> <li>• Products: stores a list of scale model cars.</li> <li>• ProductLines: stores a list of product line categories.</li> <li>• Orders: stores sales orders placed by customers.</li> <li>• OrderDetails: stores sales order line items for each sales order.</li> <li>• Payments: stores payments made by customers based on their accounts.</li> <li>• Employees: stores all employee information as well as the organization structure such as who reports to whom.</li> <li>• Offices: stores sales office data.</li> </ul> <p>Consider the above sample database and write the queries.</p>	
	a	<p>Find all employees who work in 'Paris' office.</p> <p>I. Write correlated subquery to get the results</p> <p>II. Write the same query using JOIN</p>	8
	b	Find out the total value customers in the USA ordered from the productLine 'Classic Cars'. The total value is the sum quantityOrdered * priceEach. Order by total value descending.	8
	c	Find all Motorcycles that do not have the scale numbers 1:18. Include Bike name, scale, and description into the result. Sort ascending by Scale and then Bike Name.	8
	d	Find customer who has not ordered any products	8
	e	Create a view called TRAIN_ORDERS that shows all the orders that were placed in 2003 and included models of trains (from 'Trains' product line). Include orderNumber, orderDate, shippedDate, and customerNumber fields into the view.	8