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		<b>PES University, Bengaluru</b> (Established under Karnataka Act No. 16 of 2013)		<b>UE20CS903</b>	
<b>February 2025: 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	
<b>INSTRUCTIONS</b>					
<ul style="list-style-type: none"><li>• All questions are compulsory.</li><li>• Section A should be handwritten in the answer script provided and signed at the end of the same.</li><li>• Section B and C are coding questions that must be answered in the system and uploaded in Olympus Login.</li></ul>					
<b>SECTION A – 20 MARKS</b>					
1	a	State the difference between Primary key and candidate key			2
	b	Explain any two string functions with an example			2
	c	Can we use aggregate functions in where clause? Justify your answer			2
	d	What is Cross-Join?			2
	e	Aryan, a database administrator, has grouped records of a table with the help of group by clause. He needs to further filter groups of records generated through group by clause. Suggest suitable clause for it and properly explain its usage with the help of an example			2
<b>SECTION B – 40 MARKS</b>					
2	a	What are the uses of Window Function?			2
	b	Explain about EXISTS operator			2
	c	What is percent rank? Explain with an example			2
	d	State and explain in brief types of Locks in database.			2
	e	Explain the different ways you can restrict the data in a column. Demonstrate with Examples.			2
<b>SECTION B – 40 MARKS</b>					
3	a	Use hospital database for the all the questions: From the world_happiness_report table, identify the country where the perception of corruption was the lowest in the most recent year available.			3
	b	List the top 5 countries with the highest social support scores for every year. Arrange the data in ascending order of year.			5
	c	Identify countries where the freedom to make life choices was greater than 0.8 for both 2019 and 2020.			5
	d	Calculate the yearly average of Negative_Affect across all countries and arrange the data from lowest to highest.			3

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	e	Retrieve the country with the highest Healthy_life_expectancy_at_birth and its corresponding value.	4
	f	Compute a rolling average of Positive_affect for each country using a 3-year moving window.	5
	g	Write a subquery to find the lowest Social_support value in the most recent year and identify the corresponding country.	5
	h	Generate a report to list healthcare providers with the highest number of discharges, including the average charges and payments per provider, sorted in descending order.	5
	i	Generate a report displaying the insurance coverage ratio for all healthcare providers, arranged from lowest to highest. The insurance coverage ratio is calculated as $\text{Average Covered Charges} / (\text{Average Total Payments} + \text{Average Medicare Payments})$ .	5
		<b>SECTION C – 40 MARKS</b>	
4	a	Use sales schema to answer the below questions: Write a Query to display the customers who have similar first name. (Use Tables: customer)	8
	b	Write a Query to find the customerid, invoice date and previous invoice dates for every customer. (Use Tables: invoice)	5
	c	Write a Query to find the total tracks for each genre, which has unit price more than 0.9 and genre name starts with 's'. (Use Tables: track, genre)	5
	d	Using the sales database, write a query to rank customers based on number of unique albums purchased by them in the lifetime. (Use Tables: track, invoiceline, invoice)	8
	e	Write a Query to get the details of total number of tracks billed per composer. Sort the result in the descending order of the total tracks billed. (Use Tables: track , invoiceline) .	6
	f	Using the sales database, write a query to create a virtual table to display the details like customerid, billing city and customer city and the number of albums billed in each order placed(invoice raised). (Use Tables: track, invoiceline, invoice, customer)	8