DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Assignment-2

Answer any 13 Questions.

Must include Q12, Q13, Q18, Q19 and Q21.

Semester: 5th	Date: 25/01/2024
Subject Name: Artificial Intelligence and Machine Learning	Subject Code: 21CS54

Q. No.	Questions-Module 2, and 3	Marks	CO	Level
Q1.	Define Machine learning and provide steps using which machine gather experience.	8	CO2	L2
Q2.	Elaborate on different types of machine learning.	8	CO2	L2
Q3.	Explain the challenges to be addressed by machine learning.	8	CO2	L2
Q4.	Describe key steps involved in machine learning process.	8	CO2	L2
Q5.	Discuss some of the notable applications of ML across different domains.	8	CO2	L2
Q6.	Define Data. Explain key characteristics of big data.	8	CO2	L2
Q7.	Explain different types of database representations.	8	CO2	L2
Q8.	Describe different types of data analytics.	8	CO2	L2
Q9.	Outline Big data analysis framework with its 4 layer architecture.	8	CO2	L2
Q10.	Explain the concept of central tendency along with its formulae.	8	CO2	L2
Q11.	For Patient's age list {12, 14, 19, 22, 24, 26, 28, 31, 34}, find the Inter Quartile Range.	8	CO2	L2
Q12.	Find covariance and correlation for data X = {1, 2, 3, 4, 5} and Y = { 1, 4, 9, 16, 25}	8	CO2	L2
Q13.	Solve using LU decomposition $A=\begin{bmatrix}1 & 2 & 4\\ 3 & 3 & 2\\ 3 & 4 & 2\end{bmatrix}$	8	CO2	L2
Q14.	Discuss in detail about continuous and discrete probability distributions.	8	CO2	L2
Q15.	Explain maximum likelihood estimation in parametric density estimation.	8	CO2	L3
Q16.	What is Gaussian-Mixture model? Explain stages of EM algorithm.	8	CO2	L2
Q17.	Describe t-test, paired t-test and chi-square test.	8	CO2	L2
Q18.	Apply PCA for the following matrix and prove that it works [4 3 1 2]		CO2	

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Q19.	Write Find-S algorithm and apply the same for given dataset.	8	CO3	L3
Q20.	Discuss Candidate Elimination algorithm.	8	CO3	L2
Q21.	Apply Candidate Elimination algorithm for the above dataset.	8	CO3	L3
Q22.	Explain Weighted K-NN algorithm	8	CO3	L2

sky	Air-temp	humidity	wind	water	forecast	Enjoy-sport
sunny	warm	normal	strong	warm	same	yes
sunny	warm	high	strong	warm	same	yes
rainy	cold	high	strong	warm	change	no
sunny	warm	high	strong	cool	change	yes

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