

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: AIML
Program: MSC-CHEMISTRY-II
Course Code: CSAI 7016

Semester: 2nd
Time : 03 hrs.
Max. Marks: 100

Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.	Question	Marks	CO
Q 1	What are the Threats of Artificial Intelligence in Healthcare?	4	CO1
Q 2	What are social and ethical issues in information technology?	4	CO2
Q 3	What are the steps of sentiment analysis? What are the common challenges with which sentiment analysis deals?	4	CO2
Q 4	Let us consider the following dataset. Identify all the outliers exist in the dataset. Dataset: X = [12, 10, 15, 25, 5, 11, 19, 50, 45, 55, 75, 100].	4	CO3
Q 5	Write down the current and future prospects of AI in medical research.	4	CO4

SECTION B
(4Qx10M= 40 Marks)

Q 1	Develop a regression model and calculate the performance of the model.		CO3																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Year</th> <th style="width: 30%;">Chemical composition</th> <th style="width: 40%;">Profit in thousand</th> </tr> </thead> <tbody> <tr><td>2015</td><td>5.5</td><td>70</td></tr> <tr><td>2016</td><td>5.0</td><td>65</td></tr> <tr><td>2017</td><td>4.5</td><td>60</td></tr> <tr><td>2018</td><td>3.5</td><td>55</td></tr> <tr><td>2019</td><td>3.0</td><td>50</td></tr> <tr><td>2020</td><td>6.0</td><td>67</td></tr> <tr><td>2021</td><td>6.5</td><td>62</td></tr> </tbody> </table>			Year	Chemical composition	Profit in thousand	2015	5.5	70	2016	5.0	65	2017	4.5	60	2018	3.5	55	2019	3.0	50	2020	6.0	67	2021	6.5	62
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Q 2	Consider a classification model $\delta \left(\frac{e^y}{1+e^y} \right)$ for the following dataset In addition, calculate the performance of the model.		CO3																								
	a) Find the accuracy of the model if the threshold value is considered as 0.50, 0.60																										
	b) What fraction of actual positive and negative class is correctly																										

	<p>predicted?</p> <p>c) What fraction of predicted positive and negative class is correctly predicted?</p> <table border="1"> <thead> <tr> <th>Chemical composition (X)</th> <th>Usable (yes) or not usable(no)</th> <th>Prediction of model</th> </tr> </thead> <tbody> <tr> <td>5.5</td> <td>yes</td> <td>0.55</td> </tr> <tr> <td>5.0</td> <td>no</td> <td>0.60</td> </tr> <tr> <td>4.5</td> <td>no</td> <td>0.65</td> </tr> <tr> <td>3.5</td> <td>yes</td> <td>0.70</td> </tr> <tr> <td>3.0</td> <td>yes</td> <td>0.85</td> </tr> <tr> <td>6.0</td> <td>no</td> <td>0.75</td> </tr> <tr> <td>6.5</td> <td>no</td> <td>0.70</td> </tr> </tbody> </table>	Chemical composition (X)	Usable (yes) or not usable(no)	Prediction of model	5.5	yes	0.55	5.0	no	0.60	4.5	no	0.65	3.5	yes	0.70	3.0	yes	0.85	6.0	no	0.75	6.5	no	0.70		
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Q 3	How does smart watch interact with environment and their corresponding sensors and effectors? Is smart watch predict the heart attack? Justify your answer		CO4																								
Q 4	<p>Define ANN with diagram. How it is connected with biological neural network. Draw a multi-layered ANN with assigning different weight to the input vector. Justify assigning weight to input vector performs better than the simple ANN</p> <p>OR</p> <p>Write all the steps of Algorithm engineering. In addition to this, all characteristics Algorithm engineering. Consider an chemistry experiment and write down the corresponding algorithm involved</p>		CO4																								
<p>SECTION-C (2Qx20M=40 Marks)</p>																											
Q 1	<p>Consider a classification model $\hat{y} = \frac{e^y}{1+e^y}$ for the following dataset</p> <p>In addition, calculate the performance of the model. Where y is the linear regression model.</p> <p>a) Develop linear regression with respect to independent variable X.</p> <p>b) Find the accuracy of the model if the threshold value is considered as 0.58, 0.65</p> <p>c) How many instances are misclassified?</p> <table border="1"> <thead> <tr> <th>Chemical composition (X)</th> <th>Usable (yes) or not usable(no)</th> </tr> </thead> <tbody> <tr> <td>5.5</td> <td>yes</td> </tr> <tr> <td>5.0</td> <td>no</td> </tr> <tr> <td>4.5</td> <td>no</td> </tr> <tr> <td>3.5</td> <td>yes</td> </tr> <tr> <td>3.0</td> <td>yes</td> </tr> <tr> <td>6.0</td> <td>no</td> </tr> <tr> <td>6.5</td> <td>no</td> </tr> </tbody> </table>	Chemical composition (X)	Usable (yes) or not usable(no)	5.5	yes	5.0	no	4.5	no	3.5	yes	3.0	yes	6.0	no	6.5	no		CO3								
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different time interval. Is there any connection between two chemicals? If yes, find the correlation coefficient (corr.) and justify the corr. is significant or not. In addition to this, draw a scatter plot for the given dataset.

Chemical-1	Chemical-2
20	30
23	35
8	21
29	33
11	22

OR

The data given below is the two chemicals used in a chemical factory at different time interval. Is there any connection between two chemicals? If yes, find the correlation coefficient (corr.) and justify the corr. is significant or not. In addition to this, draw a scatter plot for the given dataset.

Chemical-1	Chemical-2
20	30
23	35
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14	33
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