

Name:  
Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, May 2021**

**Course: AI and ML in Healthcare**  
**Program: M. Sc. Microbiology**  
**Course Code: CSAI 7009**

**Semester : II**  
**Time : 03 hrs.**  
**Max. Marks: 100**

**Instructions:**

1. Use A4 Size loose sheets with Black Gel pen for Section B & C . Write you're SAPID & Answer No. on Top of A4 Sheet.
2. Section A answer need to write by Keyboard, and confirm that your answer is saved and status of question is dark green.
3. Use both Mobile & Laptop for giving smooth online exam. Go to [www.upes.codetantra.com](http://www.upes.codetantra.com) only to register.
4. In Section B & C, keep showing your question in laptop, and use "Scan question" option in Mobile to upload written answer. After scan & uploading answer by mobile, press "Sync" at laptop and confirm your answer uploaded successfully.
5. If your answer is in multiple page or containing multiple parts i.e. (a), (b) & (c) etc., use "next page option" during scan by mobile and confirm in "Preview" that whole multiple page answer upload in one shot. Press "Sync" button in laptop and confirm preview in laptop also, that your answer saved in Codetantra Database successfully, then only move to next question.
6. Upload question answer simultaneously, as you complete writing each answer to avoid any technical glitches.
7. Don't wait for last minutes to upload all answers at once, this practice can put you in danger due to bandwidth/internet issue.

**SECTION A 30 marks**

Q. No.	MCQs, True/False or Fill in the blanks (1.5 marks each)	30 Marks	CO
1	_____ - intelligence is intelligence demonstrated by machines.	1.5	CO1
2	The goal of intelligent machines is to either think _____ or think like _____.	1.5	CO1
3	One great example of the use of intelligent machines in healthcare is _____.	1.5	CO1
4	An act, process, or methodology of making something (such as a design, system, or decision) as fully perfect, functional, or effective as possible is: (a) Cognitive science (b) Optimization (c) Applied statistics (d) None of these	1.5	CO1
5	Statistics is the analysis of _____ characteristics by inference from sampling.	1.5	CO1
6	If an intelligent system is issuing credit to "Asians" and is denting credit to "Australians". What can you say about the system? (a) It is an ethical system (b) It is not an ethical system	1.5	CO1
7	When it is easy to form a mathematical relationship between the input and output. Would you still like to develop machine learning to it? (a) Yes (b) No	1.5	CO1
8	Classification and regression are examples of _____ learning.	1.5	CO1
9	Clustering is an example of _____ learning.	1.5	CO1

10	Give one example of graphical user interface (GUI) based data visualization software.	1.5	CO1
11	Matrices are __ dimensional arrays.	1.5	CO1
12	Name any two mobile application or company product or service in the field of healthcare where AI or ML is currently being used.	1.5	CO2
13	In R-dataframes, two columns cannot have data of different datatypes. Is this statement true?	1.5	CO2
14	What is the primary interactive method of communication used by humans? (a) Reading (b) Writing (c) Speaking (d) All Mentioned	1.5	CO2
15	Given, A is a matrix of dimension (m x n) and B is a matrix of dimension (n x q). What will be the dimension of the matrix after performing matrix multiplication A*B? (a) m x n (b) m x q (c) n x q (d) q x m	1.5	CO2
16	Deep learning is an advancement of machine learning. Is this statement true?	1.5	CO2
17	What is the ratio in which a data is usually split into, among training, validation, and testing during ML model development.	1.5	CO2
18	One of the major downside/drawback with the use of AIML based robots in restaurants, driving, or agriculture fields is increase in _____.	1.5	CO2
19	Suppose you have dataset with 100 features, you wish to reduce the feature size to 10 without losing much information. The process with which you achieve this is known as feature _____ reduction.	1.5	CO2
20	Machine learning is the umbrella under which AI falls. Is this statement true?	1.5	CO2

**SECTION B 20 marks**

Q. No.	Short Answer Type Question (5 marks each), Scan and Upload	20 Marks	CO
21	How does supervised learning works? Discuss the process.	5	CO1
22	Discuss the different types of learning.	5	CO1
23	Write a R code/program to check whether a number is present in an array or not using if-else condition and a for loop.	5	CO2
24	Write a R code/ program to read data from a CSV file stored in a folder in your computer. Further, extract any column from the data (remember the data is imported in the form of “dataframe” from CSV file) and write it into a new CSV file.	5	CO2

**SECTION C 30 marks**

<b>Q. No.</b>	<b>Two case studies, 15 marks each, Scan and Upload</b>	<b>30 Marks</b>	<b>CO</b>
25	<p>Case Study 1</p> <ol style="list-style-type: none"> <li>Suppose you are a ML expert. A healthcare company knocks on your and asks you to develop an intelligent personal health assessment system. The first thing you will ask them for is _____. Highlight why is it important? (5)               <ol style="list-style-type: none"> <li>Hypothesis</li> <li>Support vector machine</li> <li>Data</li> <li>Nothing</li> </ol> </li> <li>Once you have it, the next thing you are going to select is a _____. (2)               <ol style="list-style-type: none"> <li>Hypothesis</li> <li>Support vector machine</li> <li>Data</li> <li>Nothing</li> </ol> </li> <li>Further, with the above two items at your hand, you are ready to train your model. Say, you choose to perform supervised training/learning. Therefore the _____ of the model will get updated based on the error between the desired output and the predicted output. The update of _____ will stop when either the error becomes zero or the error is not changing anymore. (5)</li> <li>Finally, the model is trained and ready to use. Now you will _____ the model on unknown _____ in order to check how your model is working outside the.</li> </ol>	<b>15</b>	<b>CO2</b>
26	<p>Case Study 2</p> <ol style="list-style-type: none"> <li>Suppose you wish to perform linear regression between input and output.               <ol style="list-style-type: none"> <li>Input (x): (2, 3, 4, 5, 6, 7, 8, 9)</li> <li>Output (y): (4, 9, 16, 25, 36, 49, 64, 81)</li> </ol> </li> <li>Write R-code to perform linear regression between x and y.</li> <li>When the linear regression model is ready, predict y for x = 6.5.</li> <li>Further, display the linear regression model using “plot()” function.</li> <li>At last, write R-code to perform “non-linear” regression. Plot this model as well.</li> </ol>	<b>15</b>	<b>CO1</b>
<b>SECTION- D 20 marks</b>			
<b>Q. No.</b>	<b>Long Answer type Questions Scan and Upload (10 marks each)</b>	<b>20 Marks</b>	<b>CO</b>
27	Discuss how AI is different from ML with examples.	<b>10</b>	<b>CO1</b>
28	Discuss one case/study/ in detail where AI-ML is used in your domain (for example, Microbiology students give example on microbiology and similarly for CR and N&D domains). Discuss in terms of machine learning steps.	<b>10</b>	<b>CO2</b>