Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 28-05-2025 **Time:** 01:00 pm – 04:00 pm

School: SOIS	**Program:** BCA [Data Science]	
Course Code: CSA3002	**Course Name:** Machine Learning Algorithm	
Semester: IV	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**26**	**26**	**24**	**24**	**NA**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	List a few applications of Machine Learning	**2 Marks**	**L1**	**CO1**
2.	Recall the formulae for MSE	**2 Marks**	**L1**	**CO1**
3.	State the significance of PCA	**2 Marks**	**L1**	**CO1**
4.	Define Gradient Descent	**2 Marks**	**L1**	**CO2**
5.	List a few common Data visualization tools	**2 Marks**	**L1**	**CO2**
6.	Name the command to compile a Keras model	**2 Marks**	**L1**	**CO2**
7.	What does cv2.imshow() function do?	**2 Marks**	**L1**	**CO3**
8.	List any two popular object detection models used in Python	**2 Marks**	**L1**	**CO3**
9.	Write a line of code to read an image using OpenCV	**2 Marks**	**L1**	**CO4**
10.	Recall the features of Random Forest	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

<table>
<tr><td>11.</td><td>a.</td><td>Discuss about any three machine learning algorithms with real-time applications</td><td>10 marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>The following data are Math Aptitude test and Statistics score for five students.
<table><tr><td>Math</td><td>95</td><td>85</td><td>80</td><td>70</td><td>60</td></tr><tr><td>Statistics</td><td>85</td><td>95</td><td>70</td><td>65</td><td>70</td></tr></table>1. Find the linear regression equation that predicts statistics performance, based on math aptitude scores?
2. If a student made a 75 on the math aptitude test, find what grade would we expect her to make in statistics?</td><td>10 Marks</td><td>L3</td><td>CO1</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>12.</td><td>a.</td><td>Discuss the key concepts of oversampling and under sampling techniques in Machine Learning</td><td>10 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>Apply PCA to convert a large-scale image to low-scale image while retaining the significant features with minimal loss of quality</td><td>10 marks</td><td>L3</td><td>CO1</td></tr>
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<tr><td>13.</td><td>a.</td><td>Discuss the working principle of Bayesian Optimization for hyperparameter tuning with suitable example to illustrate the process</td><td>10 Marks</td><td>L2</td><td>CO2</td></tr>
<tr><td></td><td>b.</td><td>Apply binary classification for email spam detection using proper dataset</td><td>10 Marks</td><td>L3</td><td>CO2</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>14.</td><td>a.</td><td>Summarize the significance of Feature Selection techniques in Machine Learning</td><td>10 Marks</td><td>L2</td><td>CO2</td></tr>
<tr><td></td><td>b.</td><td>Illustrate the working principle of Tokenization and Text Processing</td><td>10 Marks</td><td>L3</td><td>CO2</td></tr>
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<tr><td>15.</td><td>Show how machine learning algorithm predicts/recognizes human handwritten digits with proper coding</td><td>20 Marks</td><td>L3</td><td>CO3</td></tr>
<tr><td colspan="5">Or</td></tr>
<tr><td>16.</td><td>A supermarket uses a camera system with ANN to recognize product types on the shelf. Sometimes it confuses similar-looking items (e.g., Coke vs Pepsi). Write the code for classification of image similarity?</td><td>20 Marks</td><td>L3</td><td>CO3</td></tr>
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<tr><td>17.</td><td>Interpret the significance of Recommendation system and illustrate how movie recommendation system utilizes machine learning techniques</td><td>20 Marks</td><td>L3</td><td>CO4</td></tr>
<tr><td colspan="5">Or</td></tr>
<tr><td>18.</td><td>Show how a fraud detection system works, where 1% of transactions are fraudulent. So, you decide to use XG Boost. What technique you will use to handle the class imbalance and write the code for the same.</td><td>20 Marks</td><td>L3</td><td>CO4</td></tr>
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