| **Date: 24-06-25** | | **IMPROVEMENT CIE\_Test** | **Max. Marks: 50** | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Semester: VI** | | **UG** | **Duration: 1 Hrs** | | | |
| **Course: Digital Signal Processing and Machine Learning** | | | **Code: EC364TA** | | | |
| **Sl. No** | | **Questions** | | | **M** | **BT** | **CO** | |
| 1 | | Construct a decision tree for the following dataset showing Virat Kohli’s performance against various teams in cricket matches. Using Gini approach find out, which attribute appears as the root node, branch node and tree node with detailed calculations.     |  |  |  |  | | --- | --- | --- | --- | | Opponent | Match Type | Batting | Performance | | AUS | ODI | 2nd | GOOD | | SA | TEST | 1st | BAD | | SA | ODI | 2nd | GOOD | | AUS | TEST | 2nd | GOOD | | ENG | ODI | 2nd | GOOD | | AUS | ODI | 2nd | GOOD | | ENG | TEST | 1st | BAD | | SA | TEST | 2nd | BAD | | AUS | TEST | 1st | BAD | | SA | ODI | 1st | BAD | | | | 10 | 2 | 3 | |
| 2 | | Predict the class of the given unknown using Naïve Bayes classifier. Holiday = No, weather = Not Rainy, with friends = Yes.   |  |  |  |  | | --- | --- | --- | --- | | Holiday | Weather | With friends | Go for Kite flying | | Y | Rainy | Y | No | | Y | Rainy | N | YES | | Y | No Rainy | N | No | | Y | No Rainy | N | YES | | Y | No Rainy | Y | No | | N | No Rainy | N | No | | N | Rainy | N | YES | | N | Rainy | Y | YES | | N | Rainy | Y | No | | N | Rainy | Y | YES | | | | 10 | 2 | 2 | |
| 3 | | Design the full PCA transformation pipeline for the dataset provided:     1. Compute eigenvalues and eigenvectors 2. Identify principal components 3. Project data onto the first principal component   List the final reduced dataset. | | | 10 | 3 | 4 | |
| 4.a | | With a neat diagram, describe the LeNet Architecture Model. | | | 6 | 1 | 1 | |
| 4.b | | Differentiate between Generative Adversarial Network and Traditional Machine Learning. | | | 4 | 1 | 2 | |
| 5.a | | With a neat architecture, describe the working of LSTM Model. | | | 6 | 1 | 1 | |
| 5.b | | List any four applications of R-CNN. | | | 4 | 1 | 2 | |

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks Distribution | Particulars | | CO1 | CO2 | CO3 | CO4 | L1 | L2 | L3 | L4 | L5 | L6 |
| Test | Max Marks | 12 | 18 | 10 | 10 | 20 | 20 | 10 |  | -- | -- |

| **Date: 24-06-25** | | **IMPROVEMENT CIE\_Quiz** | **Max. Marks: 10** | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Semester: VI** | | **UG** | **Duration: 20 Mins** | | | |
| **Course: Digital Signal Processing and Machine Learning** | | | **Code: EC364TA** | | | |
| **SL.N** | | **Questions** | | | **M** | **BT** | **CO** | |
| 1. | | Given a dataset containing 14 examples, with 9 labelled as positive and 5 as negative, calculate the Gini impurity of the dataset. | | | 1 | 2 | 2 | |
| 2. | | The variance of a data is 2 and Correlation between data sets is 0.1.  If ten trees are used , what is the average variance in case of random forest as a classifier? | | | 1 | 2 | 3 | |
| 3. | | What is the Out of Bag score in Random Forests? | | | 1 | 1 | 1 | |
| 4. | | What is the importance of rotation of components in Principle Component Analysis (PCA) ?. | | | 1 | 1 | 1 | |
| 5. | | How does YOLO divide an image for object detection? | | | 1 | 2 | 2 | |
| 6. | | Define Backpropagation in Neural Network. | | | 1 | 1 | 1 | |
| 7. | | It is necessary to cluster the given seven observations into three clusters using K-means clustering. After 1st iteration, the three clusters have the following observations:  Cluster\_1: {(2, 2), (4, 4), (6, 6)}  Cluster\_2: {(0, 4), (4, 0)}  Cluster\_3: {(5, 5), (9, 9)}. Find the cluster centroids to proceed to the 2nd iteration. | | | 2 | 2 | 4 | |
| 8. | | Find the output of the given matrix after passing by 2\*2 kernel of stride 2 using Mac pool.  [ 1,3,2,4 ]  [ 5,6,1,2 ]  [ 8,7,4,0 ]  [ 3,5,6,1 ] | | | 2 | 3 | 3 | |

Blooms Taxonomy, CO-Course Outcomes, M-Marks

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks Distribution | Particulars | | CO1 | CO2 | CO3 | CO4 | L1 | L2 | L3 | L4 | L5 | L6 |
| Test | Max Marks | 03 | 02 | 03 | 02 | 03 | 05 | 02 | - | -- | -- |

**SCRUTINY & EVALUATION OF Improvement CIE QUESTION PAPER**

**Declaration by the Course handling faculties:**

As a teaching faculty of the course **Digital Signal Processing and Machine Learning**: **EC364TA**,

we hereby confirm that the question paper with Scheme and Solutions is thoroughly reviewed and we

ensure that it adheres to the following criteria:

|  |  |  |
| --- | --- | --- |
| **Sl. No** | **Criteria** | **Yes/No** |
| 1 | The question paper adequately covers the prescribed syllabus contents. |  |
| 2 | The question paper is in line with the recommended pattern, taking into consideration the structure and format suitable for the Continuous Internal Evaluation. |  |
| 3 | The question paper is designed to align with the Revised Bloom's Taxonomy, encompassing various levels of cognitive skills such as remembering, understanding, applying, analyzing, evaluating, and creating. |  |
| 4 | The question paper is aligned with the defined course outcomes, ensuring that it effectively assesses the knowledge and skills acquired during the course. |  |
| 5 | Course handling faculty (As applicable) are responsible for preparing the question paper, scheme, and solution have unanimously agreed to utilize this question paper for conducting the Continuous Internal Evaluation. |  |
| 6 | The question paper, Scheme and Solution has been submitted to the Test coordinators within the designated timeframe to ensure the smooth conduction of Continuous Internal |  |

**Course handling Faculties:**

**Name: Signature**

1. Dr. MUK
2. Dr. RK
3. Dr. VD
4. Dr. AD
5. Prof. SHB

**To be filled by the Scrutinizer:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No** | **Rubrics** | **Points** | |
| **Max** | **Awarded** |
| 1 | Timely submission of the question paper along with the scheme & solution | 10 |  |
| 2 | Heterogeneous nature of QP with respect to BTs and Cos | 10 |  |
| 3 | Format with proper entry of all particulars including test, course name, code, date, max marks, BT CO table, efficient use of paper (proper spacing, figures) | 10 |  |
| 4 | No handwritten data or diagrams | 10 |  |
| 5 | Scheme & Solution in the format | 10 |  |
|  | **Total points** | **50** |  |
| Any other comments by the scrutinizer : | | | |

**Note:** Course coordinators to obtain scrutinizer's acceptance by incorporating all suggestions from scrutiny into the final versions of QP, Scheme, and Solutions.

|  |  |
| --- | --- |
| All corrections suggested by the scrutinizer are incorporated and both the copies are re-submitted | **Signature of Course coordinator** |
| Accepted/Rejected | **Signature of Scrutinizer**  **(Name: )** |

**Signature of HOD**