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PRESIDENCYUNIVERSITY BENGALURU

SCHOOLOFENGINEERING

MAKE UP EXAMINATION- JULY 2024

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| **Semester: 2nd semester** | **Date: 3/7/2024** |
| **CourseCode: CSA3002** | **Time:9.30 AM -12.30 PM** |
| **CourseName:** **Machine Learning Algorithms** | **MaxMarks:100** |
| **Program:BCA** | **Weightage:50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3parts.*
3. *Scientific and non-programmable calculators are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | | | | | |
| **ANSWER ALL QUESTIONS 4Q X 5M=20M** | | | | | | | |
| 1 | Briefly explain the concept of supervised learning. | | | (CO 1) | | | [Knowledge] |
|  | | | | | | | |
| 2 | Explain the concept of deep learning and its historical background. | | | (CO 3) | | | [Knowledge] |
|  | | | | | | | |
| 3 | Define L1 regularization (Lasso) and its key characteristic. | | | (CO 4) | | | [Knowledge] |
|  |  | | |  | | |  |
| 4 | Describe the concept of feature selection and feature extraction. | | | (CO 2) | | | [Knowledge] |
| **PART B** | | | | | | | |
| **ANSWER ALL QUESTIONS 4Q X 10M=40M** | | | | | | | |
| 5 | How can we optimize the computational efficiency of digit recognition models for real-time applications on resource-constrained devices? | | (CO1) | | [Comprehension] | | |
|  | | | | | | | |
| 6 | What are the ethical considerations and potential biases associated with image recognition systems, especially in areas like criminal justice and healthcare? | | (CO2) | | [Comprehension] | | |
|  | | | | | | | |
| 7 | How can object detection models be made more robust to variations in object scale, occlusion, and orientation in real-world images? | | (CO3) | | [Comprehension] | | |
|  |  | |  | |  | | |
| 8 | What techniques can be used to handle cold-start problems in recommendation systems, where there is limited or no historical data for new users or items? | | (CO4) | | [Comprehension] | | |
| **PART C** | | | | | | | | |
| **ANSWER ALL QUESTIONS 2Q X 20M=40M** | | | | | | | | |
| 9 | Explain the underlying principle of Principal Component Analysis (PCA) and its role in dimensionality reduction. Provide a step-by-step explanation of how PCA works. | (CO2) | | | | [Application] | | |
|  | | | | | | | | |
| 10 | Elaborate on the concept of data augmentation and its importance in training robust machine learning models, particularly in the context of image data. | (CO3) | | | | [Application] | | |