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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION – JULY 2024

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| **Semester : V & VII (2020 and 2021 Batch)** | **Date : 10th July 2024** |
| **Course Code : ECE3031** | **Time : 09:30 a.m. – 12:30 p.m.** |
| **Course Name :Applications of Deep Learning** | **Max Marks :100** |
| **Program :B. Tech. (ECE)** | **Weightage :50%** |

**Instructions:**

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

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| **PART A** | | | |
| **ANSWER ANY 3 QUESTIONS 3Q X 5M = 15 M** | | | |
| 1 | Differentiate between Machine Learning (ML) and Deep Learning (DL) . | (CO 1) | [Knowledge] |
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| 2 | Explain the significance of depth and width of the network. | (CO 1) | [Knowledge] |
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| 3 | Explain the significance of loss function in deep learning. | (CO 3) | [Knowledge] |
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| 4 | Write a short note Ex-Or problem in simple perceptron. | (CO 2) | [Knowledge] |
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| 5 | Write a short note on curse of dimensionality. | (CO 1) | [Knowledge] |
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| **PART B** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 20M = 40M** | | | |
| 6 | Write a brief note on CNN with respect to following points   1. Convolutional layer 2. Feature extraction using filters 3. RELU layer 4. Fully connected layer 5. Performance evaluation of CNN | (CO 3) | [Comprehension] |
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| 7 | For the given confusion matrix compute following parameters   1. True Positive 2. True Negative 3. False Positive 4. False Negative 5. Accuracy 6. F1 Score 7. Positive Recall 8. Negative Recall  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | **Expected Values** | | | | | | **Actual Values** |  | **Class 1** | **Class 2** | **Class 3** | **Class 4** | | **Class 1** | 80 | 10 | 2 | 0 | | **Class 2** | 10 | 75 | 5 | 10 | | **Class 3** | 5 | 3 | 90 | 2 | | **Class 4** | 10 | 25 | 0 | 65 | | (CO 3) | [Comprehension] |
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| 8 | For the given neural network, calculate forward propagation output with Sigmoid and RELU activation function. The required values of weights and bias are as follows (Assume suitable values if needed).  W1= 0.5,W2=0.3, W3=0.5, W4=0.7, W5=0.9, W6=0.85, W7=0.45, W8=0.35, W9=0.75, W10=0.25, b1=1, b2=1, x1=1, x2=4, x3=5, t1=12, t2=6.5. | (CO 3) | [Comprehension] |
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| **PART C** | | | |
| **ANSWER ANY 3 QUESTIONS 3Q X 15M=45M** | | | |
| 9 | 1. Differentiate between AlexNet, GoogleNet and VGG with any ten points (10M) 2. Which network among the above three will be useful in plant disease detection application? (5M) | (CO 3) | [Application] |
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| 10 | As a deep network designer, you will be given with the task of developing deep neural network for crack detections in weld radiographic images. Write brief note on deep network design and validation. | (CO 4) | [Application] |
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| 11 | As a deep learning engineer, explain the need of transfer learning technique in deep network design and explain its various advantages over traditional CNN algorithms. | (CO 4) | [Application] |
|  | | | |
| 12 | Write brief note on back-propagation algorithm and mention various advantages of it over feed-forward neural network architectures. | (CO 2) | [Application] |
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