KUMARAGURU
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## B.TECH. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

## ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

U18AII4202: Neural Networks and Deep Learning

## COURSE OUTCOMES

**CO1:** Understand different methodologies to create application using deep nets.
**CO2:** Design the test procedures to assess the efficacy of the developed model.
**CO3:** Identify and apply appropriate deep learning models for analyzing the data for a variety of problems.
**CO4:** Implement different deep learning algorithms.

**Time: Three Hours**                                                                 **Maximum Marks: 100**

**Answer all the Questions: -**
**PART A (10 x 2 = 20 Marks)**
**(Answer not more than 40 words)**

| | | | |
|---|---|---|---|
| 1. | State the significance of the RELU Activation function in Convolution Neural Network. | CO1 | [$K_1$] |
| 2. | How Neural network is efficient as compared to conventional programming models? | CO1 | [$K_1$] |
| 3. | What is recurrent neural network? | CO2 | [$K_1$] |
| 4. | List the difference between CNN and RNN. | CO2 | [$K_1$] |
| 5. | Relate the significance of the nonlinear output function of the units in feedback neural networks? | CO2 | [$K_2$] |
| 6. | Define an Auto encoder. | CO3 | [$K_2$] |
| 7. | Classify the learning procedures of supervised and unsupervised deep learning. | CO3 | [$K_1$] |
| 8. | Define Underfitting. | CO3 | [$K_2$] |
| 9. | How Neural Network is useful for Pattern Recognition? | CO4 | [$K_1$] |
| 10. | Does the size of the feature map always reduce upon applying the filters? | CO4 | [$K_2$] |

**Answer any FIVE Questions: -**
**PART B (5 x 16 = 80 Marks)**
**(Answer not more than 400 words)**

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|---|---|---|---|---|---|
| 11. | a) | Draw and explain the architecture of convolutional network. | 8 | CO1 | [K$_2$] |
| | b) | Outline about Visual Geometry Group (VGG) in order to improve the performance. | 8 | CO1 | [K$_1$] |
| | | | | | |
| 12. | a) | Explain briefly about LSTM (Long Short-Term Memory). | 8 | CO2 | [K$_2$] |
| | b) | How recurrent neural network methodologies does help in Natural Language Processing? | 8 | CO2 | [K$_1$] |
| | | | | | |
| 13. | a) | Elaborate about deep learning, its uses and application and history. | 8 | CO3 | [K$_2$] |
| | b) | Compare and contrast between Deep and Shallow Network. | 8 | CO3 | [K$_2$] |
| | | | | | |
| 14. | a) | An input image has been converted into a matrix of size 12 X 12 along with a filter of size 3 X 3 with a Stride of 1. Determine the size of the convoluted matrix. | 8 | CO2 | [K$_2$] |
| | b) | Enumerate the use of deep learning techniques in computer vision. | 8 | CO2 | [K$_3$] |
| | | | | | |
| 15. | a) | Why semi supervised learning is important in deep learning? | 8 | CO4 | [K$_1$] |
| | b) | What is a training set and how is it used to train neural networks? | 8 | CO4 | [K$_2$] |
| | | | | | |
| 16. | a) | Suppose that a credit card company decided to deploy a new system for assessing credit worthiness of its customers. The new system is using a feed-forward neural network with a supervised learning algorithm. Suggest in a form of essay what should the bank have before the system can be used? Discuss problems associated with this requirement. | 8 | CO3 | [K$_3$] |
| | b) | Explain Back propagation with its algorithm. | 8 | CO3 | [K$_2$] |

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