KIET Group of Institutions

(Department of Computer Science & Engineering)
CSE/ B.Tech VII Semester
Pre-University Examination, (2021-22) ODD Semester
Deep Learning (KCS078)

Duration: 3 hrs | Max. Marks: 100

Note: -Attempt all the Questions.

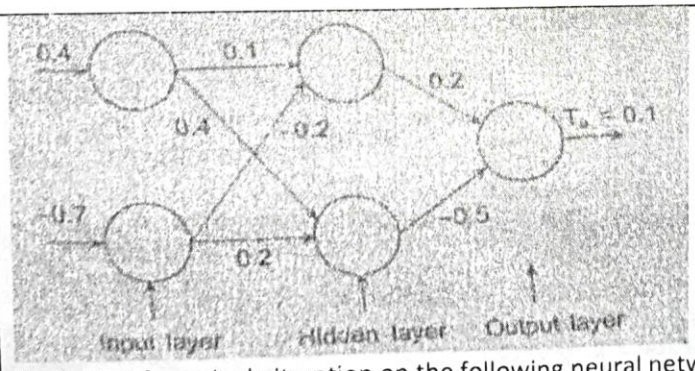
Section-A (10X2=20)

Q. No.		Question	Marks	CO	BL/ KC*
1.	a	Define neural network.	2	CO1	1/F
	b	Explain how deep Learning is more efficient than ML in case of feature extraction?	2	CO1	2/C
	c	Discuss the difference between Shallow network and Deep Neural network.	2	CO2	2/C
	d	State any two practical applications of GAN in real life.	2	CO2	1/F
	e	Discuss in brief how LDA differs from PCA	2	CO3	2/C
	f	Discuss relationship of metric learning to deep learning.	2	CO3	1/F
	g	What is dimensionality reduction ?	2	CO4	1/F
	h	State the concept of LSTM.	2	CO4	1/C
	i	What is NLP ?	2	CO5	1/C
	j	Discuss bioinformatics with respect to its relation with Deep learning.	2	CO5	2/P

Section-B (5X6=30)

Q. No.	Question	Marks	CO	BL/ KC*
2	Discuss in brief about Universal Function Approximation OR Write a short note on logistic regression.	6	CO1	2/C
3	Explain the probabilistic theory of Deep Learning. OR Explain the concept of Regularization. Explain its different types.	6	CO2	4/C
4	Explain the various hyper parameters required for deep learning optimization. OR Explain the various techniques of weights initialization in deep learning.	6	CO3	4/P
5	Illustrate the concept of deep reinforcement learning. OR Illustrate the concept of Artificial Neuroscience.	6	CO4	4/C
6	Analyze the face recognition mechanism in deep learning using some case study. OR Analyze the NLP mechanism in deep learning using some case study.	6	CO5	4/C

Section-C (5X10=50)

Q. No.	Question	Marks	CO	BL/ KC*
7	 E 0.0663 Apply BPN for a single iteration on the following neural network. Assume learning rate be 0.8	10	CO1	3/C
8	Relate SVM, Logistic regression, ANN and CNN ? Justify the concepts and use of GAN in AI domain? OR	10	CO2	6/C

- CO -Course Outcome generally refer to traits, knowledge, skill set that a student attains after completing the course successfully.

	Justify the concepts and use of Semi Supervised learning in AI domain.			
9	Consider the two dimensional patterns (5, 6), (6, 7), (7, 8).Compute the principal component using PCA Algorithm.	10	CO3	4/P
	OR			
	Compare PCA and LDA. How do LDA works for dimension reduction.			
10	Design a recurrent networks for time series prediction, elaborating it's architecture as well.	10	CO4	4/P
	OR			
	Explain LSTM network and elaborating it's architecture as well.			
11	Analyze the Wave Net deep generative model of raw audio waveforms.	10	CO5	4/F
	OR			
	Analyze the Word2vec technique for NLP.			

KIET Group of Institutions, Delhi - NCR, Ghaziabad

(Roll Number: 1802910129

(Department of Computer Science and Engineering)
B. Tech. in Computer Science and Engineering ,7th Semester
CT-1, (2021-22) Odd Semester
Course: Deep Learning (KCS 078)

Duration: 2hrs **Max. Marks: 60**

Section-A

Attempt all the questions of this section (2X10=20)

Q. No.		Question	Marks	CO	BL/ KC
1.	a	Discuss the role of bias in ANN?	2	CO1	1/F
	b	Explain the concept of Machine Learning?	2	CO1	2/C
	c	What are support vectors in SVM Algorithm?	2	CO1	1/F
	d	Define feed forward Multilayer Perceptron.	2	CO1	1/F
	e	Outline the demerits of ML.	2	CO1	1/F
	f	Discuss the difference between Shallow network and Deep Neural network.	2	CO2	2/C
	g	Define SVM Kernels? Where it is used ?	2	CO1	1/F
	h	Define artificial neural network.	2	CO1	2/C
	i	State the need of activation functions in neural networks?	2	CO1	1/F
	j	Discuss the role of dropout in overfitting.	2	CO2	2/C

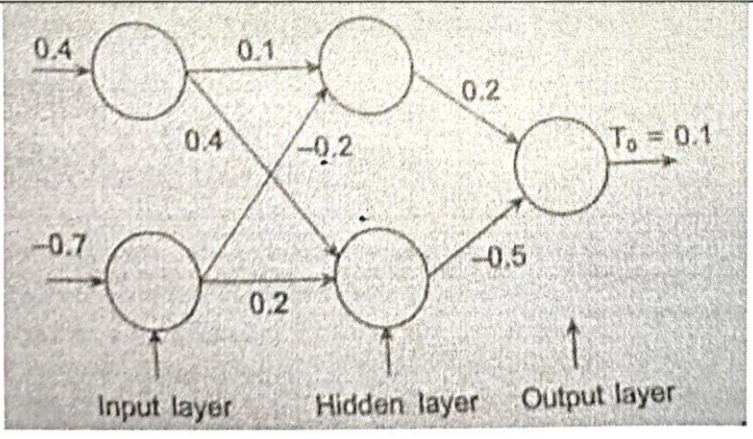
Section-B

Attempt all the questions of this Section(5X4=20)

Q. No.	Question	Marks	CO	BL/ KC
2	Compare and Contrast AI, ML and DL. OR Classify the various learning strategy of ML.	5	CO1	4/C
3	Correlate RNN through Multilayer Perceptron? OR Explain loss functions? Illustrate about various loss functions.	5	CO1	4/C
4	Discuss Regularization. Explain its different types. OR Elaborate the probabilistic theory of Deep Learning.	5	CO2	2/C
5	Discuss Universal Function Approximation theorem for neural network. OR Describe SVM and it's limitations	5	CO1	2/C

Section-C

Attempt all the questions of this Section (10X2=20)

Q. No.	Question	Marks	CO	BL/ KC
6	 Apply Forward Propagation and Backward propagation for a single iteration on the following neural network. Assume learning rate be 0.6 OR	10	CO2	3/P

<table>
<tr><td></td><td>Illustrate the differences among Gradient Descent Algorithm, Stochastic Gradient Descent Learning, Mini-batch gradient descent</td><td></td><td></td><td></td></tr>
<tr><td rowspan="3">7</td><td>Apply perceptron Learning Algorithm for AND function having two inputs and a bias denoted as $X_0 = -1$ Assume the learning rate be 0.1 and the initial weights be
<table>
<tr><td>W_0</td><td>W_1</td><td>W_2</td></tr>
<tr><td>0.5</td><td>0.5</td><td>0.5</td></tr>
</table></td><td rowspan="3">10</td><td rowspan="3">CO1</td><td rowspan="3">3/P</td></tr>
<tr><td>OR</td></tr>
<tr><td>Apply Logistic Regression using sigmoid function through a suitable example for classification problem.</td></tr>
</table>

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- **BL**–As per Revised Bloom's Taxonomy, Bloom's Levels (BLs) are the cognitive process levels viz. **1.** Remember, **2.** Understand, **3.** Apply, **4.** Analyze **5.** Evaluate and **6.** Create
- **KC** –As per Revised Bloom's Taxonomy, Knowledge Categories (KCs) are **F**-Factual, **C**-Conceptual, **P**– Procedural, **M** - Metacognitive

KIET Group of Institutions, Delhi - NCR, Ghaziabad

(Roll Number: 1802910139

(Department of Computer Science and Engineering)

B. Tech. 7th Semester

CT-2, (2021-22)Odd Semester

Course:Deep Learning (KCS 078)

Duration: 2hrs **Max. Marks: 60**

Section-A

Attempt all the questions of this section (2X10=20)

Q. No.		Question	Marks	CO	BL/ KC
1.	a	Discuss the role of CNN?	2	CO2	2/F
	b	Explain the concept of GAN?	2	CO2	2/C
	c	What do you understand by the term dimensionality reduction?	2	CO3	1/F
	d	State any two uses of Semi supervised learning in real life.	2	CO2	1/F
	e	Outline the merits of Semi supervised learning.	2	CO2	1/F
	f	Discuss the difference between Shallow network and Convolution Neural network.	2	CO2	2/C
	g	Define Generative modeling? Where it is used ?	2	CO3	1/F
	h	Define LDA?	2	CO2	2/C
	i	State the need of Mahalanobis distance in metric learning?	2	CO3	1/F
	j	Discuss the role of central point in LDA.	2	CO3	2/C

Section-B

Attempt all the questions of this Section(5X4=20)

Q. No.	Question	Marks	CO	BL/ KC
2	Explain Batch Normalization with a suitable example. OR Classify the various types of autoenocoders.	5	CO3	4/C
3	Explain the role of of max pooling and min pooling in CNN. OR Explain VC dimension with example? Illustrate about various applications of VC dimension.	5	CO2	4/C
4	Explain Generative Model in GAN OR Explain the role of convolution layer in CNN.	5	CO2	2/C
5	Discuss the role of auto encoders and it's components with a suitable diagram. OR Elaborate the concept of metric learning in reference to deep learning.	5	CO3	2/C

Section-C

Attempt all the questions of this Section (10X2=20)

Q. No.	Question	Marks	CO	BL/ KC
6	Given below is an input matrix named I, kernel matrix, calculate the Convoluted matrix C using stride =1 also apply max pooling on C. Input Matrix I 1 0 0 1 1 0 1 0 0 1 1 1 0 1 1 1 1 0 1 0 1 1 1 0 1 0 0 0 1 0 1 0 1 1 0 0 1 1 0 0 1 1 0 1 1 1 0 1 1 Kernel Matrix 1 0 0 0 1 1 1 1 0 OR Illustrate the various steps involved in CNN for feature learning and classification of any typical image. Elaborate with a suitable diagram.	10	CO2	3/P

7	Consider the two dimensional patterns (2, 1), (3, 5), (4, 3), (5, 6). Compute the principal components using PCA Algorithm.	10	CO3	3/P
	OR			
	Illustrate the various steps of LDA in dimensionality reduction with a suitable example.			

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B.TECH.
(SEM VII) THEORY EXAMINATION 2021-22
DEEP LEARNING

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a. What are the applications of Machine Learning? When it is used.
b. What is deep learning , Explain its uses and application and history.
c. What is Visual Geometry Group (VGG)?
d. What is SVMs and Perceptrons?
e. What is Neural networks as universal function approximates?
f. What are batch normalization?
g. Define Generative Adversarial Networks (GAN).
h. What are dimensionality reduction techniques?
i. What is deep learning techniques?
j. Define Optimization in deep learning.

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a. Draw and explain the architecture of convolution network .
b. Difference between Deep and Shallow Network.
c. What is semi – supervised learning ?
d. Explain Back propagation with its algorithm.
e. Explain different components of SOA and their functionalities.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain LSTM (Long Short Term Memory).
(b) What is PCA (Principle Component Analysis) and RNN ?

4. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What are some common problems with LSTM?
(b) How AI and neuroscience drive each other forwards?

5. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain Fractal Structure and Generalization Properties of Stochastic Optimization Algorithms.
(b) What are the applications of a recurrent neural network RNN?

6. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain Recurrent Neural Networks and Natural Language Processing.
(b) What are good quality word embedding and how to generate them?

7. Attempt any *one* part of the following: **10 x 1 = 10**

(a) How will the use of facial recognition by private companies affect privacy?
(b) Explain Image Captioning in Deep Learning.