

Reg.No.:



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 50032

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024

Fifth Semester

Computer Science and Engineering

U19CSV33– FUNDAMENTALS OF DEEP LEARNING

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

Q.No.	Questions	(10 x 2 = 20 Marks)		
		Marks	KL	CO
1.	Differentiate between a high-bias model and a high-variance model.	2	K2	CO1
2.	How would you detect overfitting and underfitting?	2	K2	CO1
3.	What are batch, mini-batch, and stochastic gradient descent?	2	K1	CO2
4.	What is meant by gradient-based learning?	2	K1	CO2
5.	Identify the consequences of learning rate being too low or high.	2	K2	CO3
6.	Give any two ways of data augmentation for images in deep learning.	2	K1	CO3
7.	List the drawbacks of recurrent neural networks.	2	K1	CO5
8.	How does Bidirectional RNNs work?	2	K1	CO5
9.	Infer the need of convolution operation in deep learning.	2	K2	CO4
10.	If we have a dataset with 10,000 records and a batch size of 100, then how many iterations will our model run for?	2	K2	CO4

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11.	<p>a) How can one control capacity of a learning algorithm? Also explain Vapnik-Chervonenkis dimension. (OR)</p> <p>b) For the following random samples, find the maximum likelihood estimate of θ:</p> <ol style="list-style-type: none"> 1. $X_i \sim \text{Binomial}(3, \theta)$, and we have observed $(x_1, x_2, x_3, x_4) = (1, 3, 2, 2)$. 2. $X_i \sim \text{Exponential}(\theta)$ and we have observed $(x_1, x_2, x_3, x_4) = (1.23, 3.32, 1.98, 2.12)$. 	7+6	K2	CO1
12.	<p>a) Solve the XOR Problem with Neural Networks. (OR)</p> <p>b) Identify the stages of backpropagation in neural networks and explain its operation with a neat sketch.</p>	13	K2	CO2
13.	<p>a) Organize the working of semi supervised learning and explain the types of semi-supervised learning? (OR)</p> <p>b) Organize the working principle of hard parameter sharing and soft parameter sharing multitask learning in deep neural networks?</p>	13	K3	CO3
14.	<p>a) Explain how LSTM and GRU work. Which is the best one to use and why? (OR)</p> <p>b) Explain Seq2Seq (encoder-decoder) models? How is it different from Autoencoders?</p>	7+6	K2	CO5
15.	<p>a) How does parameter sharing work in convolutional layers? Illustrate with an example. (OR)</p> <p>b) Explain the structure of a typical CNN architecture with a diagram.</p>	13	K2	CO4

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	How does backpropagation through time (BPTT) work in RNNs? What are the challenges associated with training vanilla RNNs with architecture diagram?	7.5+ 7.5=15	K2	CO5
(OR)				
b)	Infer the purpose of adding fully connected layer at the end in CNN with an example. Organize the features of Deep Recurrent Neural Networks.	7.5+ 7.5=15	K3	CO4
