K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:VII
Class:FINAL	Program:B.Tech
Branch Code:ETC	Pattern:2022
Name of Course:Deep learning and Big Data Analysis	Course Code:ETC224005D
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains ___2__page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	**Differentiate between AI, ML, and DL.**	(6)	CO1
Question No. 2			
2a)	**Explain stochastic gradient descent (SGD).**	(6)	CO2
Question No. 3			
3a)	**Explain the architecture of a Convolutional Neural Network (CNN) with a neat labelled diagram. Describe the function of convolution and pooling layers.**	(8)	CO3
	OR		
3b)	**Explain the detailed architecture of a Gated Recurrent Unit (GRU). How does its gating mechanism help in handling long-term dependencies?**	(8)	CO3
3c)	**Given a scenario of time-series weather prediction, justify whether you would use a CNN, a simple RNN, or an LSTM. Provide two concrete reasons for your choice.**	(8)	CO3
	OR		
3d)	**Compare and contrast the architectures of Autoencoders and Generative Adversarial Networks (GANs) based on their purpose, components, and training process.**	(8)	CO3
Question No. 4			

4a)	**With a neat diagram, explain the master-slave architecture of HDFS. Clearly state the responsibilities of the NameNode and DataNode.**	(8)	CO4

OR

4b)	**Explain the MapReduce programming model with a suitable example (e.g., Word Count).**	(8)	CO4
4c)	**Compare and contrast Spark RDDs and DataFrames based on their structure, optimization, and typical use-cases.**	(8)	CO4

OR

4d)	**Compare SQL vs. NoSQL. Applications of Kafka**	(8)	CO4

Question No. 5

5a)	**Explain role of GPUs in distributed DL training.**	(8)	CO5

OR

5b)	**Explain the concept of "Data Locality" in the context of distributed computing. Why is it crucial for performance in frameworks like Hadoop and Spark?**	(8)	CO5
5c)	**Challenges of integrating DL with Big Data systems.**	(8)	CO5

OR

5d)	**Describe a case study for building a real-time fraud detection system. Explain how you would integrate Big Data technologies (like Spark Streaming) with a Deep Learning model.**	(8)	CO5

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