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:VI
Class:TY	Program:B.Tech
Branch Code:INT	Pattern:2022
Name of Course:Artificial Intelligence & Neural Networks	Course Code:INT223014A
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 02 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)	Explain how AI techniques improve real-world problem solving.	(6)	CO1
Question No. 2			
2a)	Do you think that A* generates optimal search solutions? Justify with example.	(6)	CO2
Question No. 3			
3a)	Explain the following terminologies with respect to artificial neural networks: weights, bias, learning rate, momentum factor, vigilance parameter. What are the limitations of neural networks?	(8)	CO3
	OR		
3b)	Describe the concept of Backpropagation and explain its significance in neural network training.	(8)	CO3
3c)	How does the ReLU activation function help in training deep neural networks? Discuss its advantages.	(8)	CO3
	OR		
3d)	Explain the role of the output layer in a neural network for classification tasks. Discuss how different activation functions affect the output.	(8)	CO3
Question No. 4			
4a)	How does the pooling operation help in reducing computational complexity in CNNs?	(8)	CO4
	OR		
4b)	Explain the concept of fine-tuning in CNNs and how it is applied to transfer learning.	(8)	CO4
4c)	How does the use of attention mechanisms enhance CNN performance in tasks like object detection?	(8)	CO4
	OR		
4d)	Discuss the importance of data augmentation in training CNNs. Provide examples of common data augmentation techniques.	(8)	CO4

Question No. 5

5a)	Discuss the challenges of training RNNs and how the vanishing and exploding gradient problems affect their performance.	(8)	CO5

OR

5b)	How does Backpropagation Through Time (BPTT) work in RNNs? Describe the key steps involved.	(8)	CO5
5c)	Evaluate the impact of RNNs in Natural Language Processing (NLP) tasks such as machine translation and sentiment analysis. Using real-world examples, compare the effectiveness of RNNs against traditional machine learning models.	(8)	CO5

OR

5d)	Critically analyze the challenges of training deep Recurrent Neural Networks (RNNs) in sequence learning tasks. Provide a detailed explanation of how techniques such as gradient clipping, batch normalization, and advanced architectures like LSTMs and GRUs address these challenges. Include real-world scenarios to illustrate your answer.	(8)	CO5

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