Seat No

Question Paper Code

WALCHAND INSTITUTE OF TECHNOLOGY, SOLAPUR
An Autonomous Institute affiliated to PAH Solapur University, Solapur

Information Technology
Final Year B. Tech. Sem-VII 2024-25 (CBCS pattern)
End Semester Examination

Course: Generative AI — Max. Marks: 60 — SET: P
Course Code: 21TU7CC21
Day and Date: Friday 06/12/2024 — Time: 02:30 pm to 05:30 pm

Instructions:
1. All questions are compulsory.
2. Assume suitable data wherever necessary.
3. Draw neat sketches wherever necessary.
4. Q.1 should be solved in first 30 minutes and answers should be written only on the first page of answer book.
5. Supplements will not be provided.
6. Use of nonprogrammable calculator is permitted.

Q. No	Sub Que		Marks
1		**Multiple Choice Questions**	12
	i.	What is the main goal of Generative AI? A) To analyse existing data B) To create new data or content C) To sort data into categories D) To compress data	
	ii.	What is a common ethical concern associated with Generative AI? A) Data integrity B) Creation of realistic but fake content C) Data loss D) Increased computational power	
	iii.	What does the standard deviation measure in a data set? A) The average value B) The central tendency C) The spread of the values around the mean D) The frequency of occurrence	
	iv.	What is the primary purpose of using Bayes' theorem in AI? A) To reduce dimensionality B) To update probabilities based on new evidence C) To perform clustering D) To improve sorting algorithms	
	v.	Which type of learning algorithm is used when the output labels are not known? A) Unsupervised learning B) Supervised learning C) Reinforcement learning D) Semi-supervised learning	

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	vi.	Which framework is known for its dynamic computational graphs? A) PyTorch B) Scikit-learn C) TensorFlow D) Keras	
	vii.	Which type of generative model uses a probabilistic approach to encode and d ecode data? A) VAE B) GAN C) SVM D) K-means clustering	
	viii.	What is the role of the generator in a GAN? A) To generate new data B) To classify data C) To evaluate data authenticity D) To preprocess data	
	ix.	What is a critical aspect of responsible AI innovation? A) Prioritizing speed over accuracy B) Ensuring transparency and accountability C) Ignoring ethical concerns D) Focusing solely on technical improvements	
	x.	How is Generative AI used in the entertainment industry. A) To manage inventory B) To automate accounting C) To forecast weather D) To generate realistic special effects	
	xi.	Which application is a common use case for sequence-to-sequence models in NLP? A) Sentiment analysis B) Machine translation C) Image classification D) Object detection	
	xii.	What is the key feature of the Transformer architecture that sets it apart from RNNs? A) Convolutional layers B) Sigmoid activation C) Recurrent layers D) Self-attention mechanism	

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se: Generative AI — Max. Marks: 60 — SET: P
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	Attempt any four.	**12**
.	Elaborate the concept of deepfakes and discuss how Generative AI is used to create them	
.	Illustrate how does Generative AI contribute to advancements in creative fields such as art and music?	
i	Elaborate the ethical concerns associated with Generative AI? Provide examples to illustrate these concerns.	
.	Illustrate any two major applications of Generative AI used in different industries.	
	Differentiate between AI and Generative AI	
	Write short note on Generative model.	
		12
	Apply the concept of Bayes' Theorem to a diagnostic test scenario: Assume there's a disease affecting 2% of the population. A diagnostic test for this disease has a sensitivity (true positive rate) of 95% and a specificity (true negative rate) of 90%. If a person tests positive, calculate the probability that they actually have the disease.	
	Use linear regression to predict future values based on the following data points X= [1,2,3,4,5] and Y=[2,3,5,4,6] Calculate the linear regression line and predict the value of y when x=6.	
	A sample of 40 students is taken to estimate the average test score of a larger population. The sample mean score is 78, and the sample standard deviation is 10. Construct a 95% confidence interval for the population mean score.	

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	Attempt any 4.	12
	Elaborate the concept of cross-validation in machine learning. How does cross-validation help in building robust models? Describe one commonly used cross-validation technique.	
	Give details of overfitting in machine learning, and how can it be prevented?	
	Illustrate the role of activation functions in neural networks.	
	Describe the backpropagation algorithm and its importance.	
	Illustrate the evaluation metrics, and why are they crucial in machine learning?	
		12
	Design a Generative AI-based system for real-time language translation in a multilingual conference setting. Outline the components and steps required to implement this system, including data collection, model selection, training, and deployment.	
	Apply the principles of Generative AI to develop a system for personalized content generation on social media platforms. Describe the process of collecting user data, training the model, generating content, and ensuring the ethical use of the system.	
	Create a Generative AI framework to enhance cybersecurity through the generation of realistic phishing email scenarios for training purposes. Detail the steps involved in collecting data, designing the generative model, generating training scenarios, and evaluating the effectiveness of the system.	