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MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
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Model Question Paper

Seventh Semester B.E Degree Examination

Generative AI

Time: 3 Hours (180 Minutes) **Max. Marks: 100**

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

		Module -1	M	L	C
Q1	a.	Differentiate between Generative models and Discriminative models with suitable examples.	8	L2	CO1
	b.	Explain what a generative modeling framework is and its main purpose.	6	L2	CO1
	c.	Explain the main applications of generative models in AI and machine learning.	6	L2	CO1
		OR			
Q2	a.	Explain the main characteristics that distinguish generative models from discriminative models.	8	L2	CO1
	b.	List out and discuss advantages and disadvantage of generative AI	6	L2	CO1
	c.	Explain the main challenges faced by generative AI models.	6	L2	CO1
		Module- 2			
Q3	a.	Apply the architecture of an autoencoder to process an input image through the encoder and decoder for image reconstruction.	10	L3	CO2
	b.	Apply latent space representations to transform random vectors into images and illustrate the image generation process.	10	L3	CO2
		OR			
Q4	a.	Implement a GAN framework and illustrate how the generator and discriminator interact to produce synthetic data.	10	L3	CO2
	b.	Examine the role of the critic in WGAN-GP by executing its function in improving model training and output quality.	10	L3	CO2
		Module – 3			
Q5	a.	Summarize the different types of LLMs, including autoregressive, encoder–decoder, and masked language models.	10	L2	CO3
	b.	Explain how a pre-trained language model (PLM) can be used for text classification or sentiment analysis on a custom dataset.	10	L2	CO3
		OR			
Q6	a.	Explain the concept of statistical language models and how they predict the probability of word sequences.	10	L2	CO3
	b.	Describe the application of a large language model (LLM) in real-world tasks such as chatbot creation, document summarization, or automated content generation, and summarize how its effectiveness can be measured.	10	L2	CO3
		Module – 4			
Q7	a.	Apply the denoising diffusion process to generate synthetic data from random noise.	10	L3	CO4

	b.	Apply encoder–decoder layers with skip connections in U-Net to reconstruct clean images from noisy inputs.	10	L3	CO4
OR					
Q8	a.	Use diffusion time-step parameters to control the amount of noise added at each stage of the diffusion process.	10	L3	CO4
	b.	Apply the reverse diffusion sampling process to generate images from a trained denoising diffusion model.	10	L3	CO4
Module – 5					
Q9	a.	Apply tokenization and embedding techniques to prepare input text for a transformer model.	10	L3	CO5
	b.	Use feature maps from convolution layers to compute query, key, and value representations in the SAGAN attention block.	10	L3	CO5
OR					
Q10	a.	Apply the key components of GPT architecture to develop a simplified GPT model using a deep learning framework.	10	L3	CO5
	b.	Use the StyleGAN generator components (mapping network, AdaIN, noise injection) to generate images from latent vectors.	10	L3	CO5

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