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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 04 - 01- 2025 **Time:** 9:30 am – 12:30 pm |

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| **School:** SOCSE | **Program:** B.Tech (COM/CAI/CSE/CEI/IST/CST/CDV/CBC /CSD/ISE/ISR/ISD) | |
| **Course Code :** CSE3348 | **Course Name :** GENERATIVE AI | |
| **Semester**: VII | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **24** | **24** | **26** | **26** | **-----** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. 10 x 2 Marks=20 Marks** | | | | |
| **1** | Name a model by NVIDIA that generates hyper-realistic images of human faces. | **2 Marks** | **L1** | **CO1** |
| **2** | What are conversational agents? | **2 Marks** | **L1** | **CO1** |
| **3** | How RNN works? | **2 Marks** | **L1** | **CO2** |
| **4** | What is an Encoder? | **2 Marks** | **L1** | **CO2** |
| **5** | Define Agent | **2 Marks** | **L1** | **CO3** |
| **6** | List the steps involved in training an Encoder | **2 Marks** | **L1** | **CO3** |
| **7** | Label the benefits of Langchain Agents | **2 Marks** | **L1** | **CO3** |
| **8** | Recall the formula to calculate Loss function in diffusion models | **2 Marks** | **L1** | **CO4** |
| **9** | List a few popular diffusion models | **2 Marks** | **L1** | **CO4** |
| **10** | Define Forward Diffusion | **2 Marks** | **L1** | **CO4** |

**Part B**

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| **Answer the Questions Total 80 Marks.** | | | | | |
| **11.** | **a.**  **b.** | Classify the different types of data modalities with proper example  Identify a future scenario where LLMs are widely integrated into daily life. Interpret ethical concerns might arise? | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO1**  **CO1** |
| **Or** | | | | | |
| **12.** | **a.**  **b.** | Compare and contrast the LLM architectures such as GPT-3, XLNet and T5  Identify the variants of Prompt components with suitable example | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO1**  **CO1** |
|  |  |  |  |  |  |
| **13.** | **a.**  **b.** | Summarize the types of RNN with suitable example  Solve the following **input text** for the decoder: **“The weather today is”.** Use the following simplified vocabulary to predict the next word in the sequence:  **Vocabulary: [“sunny”, “rainy”, “cloudy”, “snowy”, “windy”]**  **Logits=[2.5,1.0,3.5,0.5,1.2]**  Your Task is to find:   1. Identify the next word predicted by the decoder. 2. Write the probabilities for each word in the vocabulary using softmax. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO2**  **CO2** |
| **Or** | | | | | |
| **14.** | **a.**  **b.** | Compare and contrast the variants of transformer architecture as BERT & GPT  Apply the Byte Pair Encoding to each of the strings in the following corpus: “xxxyz yxxxy zzzxy zxyxy”. Use uppercase letters (e.g., A, B, etc.) to denote different encodings, and demonstrate each expansion. Merges should begin with A, followed by B, C, D, and so on. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO2**  **CO2** |

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| **15.** | **a.**  **b.** | Explain the significant of LLM and summarize any five core key components  Develop code for information retrieval using agents and tools in Langchain *(Hint: different types of chains using spider IDE and Open AI)* | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO3**  **CO3** |
| **Or** | | | | | |
| **16.** | **a.**  **b.** | Infer the concept of vector store in Langchain with a neat sketch  Apply the appropriate multi-modal generator tool and write the code for converting audio to text. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO3**  **CO3** |

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| **17.** | **a.**  **b.** | Outline the GAN architecture with the its applications  Indentify how stable diffusion differs from GAN and VAE’s and also explain the working principle of SD with its components | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO4**  **CO4** |
| **Or** | | | | | |
| **18.** | **a.**  **b.** | Explain Latent Diffusion Model (LDM) and infer its loss function  Identify the significance of forward and reverse diffusion model summarize its loss function. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO4**  **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***