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:ADS	Pattern:2022
Name of Course:Generative AI and Prompt Engineering	Course Code:ADS224002
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

1 Calculate the cosine similarity between the vectors for **"Apple"** and **"Banana"**. What does the result tell you about their relationship? (6) CO1

Word	**Vector Representation**		
Apple	0.6	1.0	0.9
Banana	0.8	0.9	0.7
Chair	1.8	2.0	1.8

Question No. 2

2 Explain the forward and reverse diffusion process in the diffusion model with a diagram. (6) CO2

Question No. 3

3.a) Explain Multi Head Attention Mechanism with diagram. (6) CO3

OR

3.b) Explain Transformer architecture with diagram. (6) CO3

3.c) What is Probabilistic Text Generation? Explain its types with example. (5) CO3

OR

3.d)	What is positional embedding? Explain types of positional embedding with example.	(5)	CO3
3.e)	Write any 5 applications of LLMs in Real-World Tasks.	(5)	CO3

OR

3.f)	What is OpenAI models? Differentiate between GPT-3.5 Turbo, GPT-4, Gemini and LLaMA (Meta) based on points 1> Key Strengths 2> Limitations	(5)	CO3

Question No. 4

4.a)	A customer support chatbot handles 1,000 conversations per day, and each conversation uses an average of 200 tokens (input + output combined). The organization is evaluating the cost of using different GPT models via API. GPT-4 costs $0.03 per 1,000 tokens. Calculate the daily and annual cost of running this chatbot using GPT-4.	(6)	CO4

OR

4.b)	A marketing analytics company uses GPT-4 to generate daily client reports. Originally, it consumed 500,000 tokens per day. After optimizing its prompts, the company reduces its token usage by 25%. Given that GPT-4 costs $0.03 per 1,000 tokens, Tasks: 1. Calculate the new daily token usage after optimization. 2. Find the daily cost before and after optimization. 3. Calculate the monthly savings (30 days) from the reduced token usage.	(6)	CO4
4.c)	You are tasked with designing a prompt system for a **medical information assistant** where **accuracy and reliability** are more important than creativity. List and explain which API parameters you would adjust to achieve this goal, including approximate value ranges. Justify how your parameter selection supports factual accuracy.	(5)	CO4

OR

4.d)	A marketing team uses ChatGPT on the web to generate ad copies. They now want to build a content generator tool that fetches results automatically. Which approach should they switch to — Web Interface or API? Explain how it improves workflow efficiency and which API features make this possible.	(5)	CO4
4.e)	Your organization wants to build a smart document search system that retrieves the most relevant paragraphs based on meaning rather than exact keywords. Explain how a vector database can be applied in this case. Describe the steps involved in storing and retrieving information using embeddings.	(5)	CO4

OR

4.f)	A customer support team wants to create an AI chatbot that answers product-related questions using up-to-date manuals. Explain how RAG improves reliability compared to using only a large language model (LLM) without retrieval.	(5)	CO4

Question No. 5

5.a)	Compare and contrast Tree of Thoughts (ToT) and Graph of Thoughts (GoT). Comparison Points: Structure, Information Flow, Flexibility, Application domain.	(6)	CO5

OR

5.b)	Explain zero-shot prompting, one-shot prompting, and few-shot prompting with examples.	(6)	CO5
5.c)	Describe the concept of Chain-of-Verification (CoVe) and its role in improving output accuracy	(5)	CO5

OR

5.d)	What is Chain-of-Code (CoC) prompting and how is it useful in problem solving?	(5)	CO5
5.e)	Describe the role of Prompt Engineering in conversational AI.	(5)	CO5

OR

5.f)	Explain the concept of Text Augmentation and its importance in NLP.	(5)	CO5

····· End of question paper·····