Pearson

# Generative AI Foundations

This exam validates the candidate has a fundamental understanding of Generative AI, its uses in personal and professional contexts, and the responsible and ethical management of such technology.

A successful candidate will not only have the technical proficiency necessary to interact with Generative AI tools, but will also be able to demonstrate a strong ethical framework for using AI technology, including:

- Understanding privacy implications
- Recognizing bias
- Considering issues surrounding intellectual property rights

Candidates are expected to have 150 hours of a combination of instruction and hands-on experience working with Generative AI tools. They should be familiar with productivity applications, such as Microsoft 365 or Google Docs.

## 1. Generative AI Methods and Methodologies

### 1.1 Define Generative AI.

i Compare and contrast Generative AI with predictive AI, discriminative AI, analytical AI, statistical AI.

ii Compare and contrast Generative AI with search engines.

iii Fundamental understanding of diffusion model, transformer model, generative adversarial networks (GANs), variational autoencoders (VAEs).

### 1.2 Explain the basic processes Generative AI uses to produce an output.

i Understand that each model is trained differently.

- Text models include: OpenAI GPTx, Google Gemini, Anthropic Claude, Meta LLaMA
- Image models include: DALL-E, Adobe Firefly

ii Large language models (LLMs) need a large amount of training data to perform effectively.

iii LLMs are trained on such a huge dataset that there will be opinions and points of view.

iv Image models are trained on text-image pairs that are manually tagged.

v Training a model consumes a large amount of energy and requires powerful GPUs.

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vi Model Types: Diffusion, transformer, variational autoencoders (VAEs), Generative Adversarial Networks (GANs)

vii Key terms: neural networks, convolutional neural network, tokenization, diffusion, noise generation, refinement algorithms, hyperparameters, dataset

### 1.3 Recognize the input and output types used in a Generative AI scenario.

i You can use multiple inputs to get an output.

- Inputs include: text, audio, video, images
- Output types include: generative text, generative video, generative image, generative audio

ii Different tools allow different types of input to generate an output.

### 1.4 Recognize that Generative AI models can be customized to perform individualized tasks.

i Self-contained app that does a task for you.

- Examples: Custom GPT, Google Gems, Microsoft Copilots

### 1.5 Select an appropriate tool to perform a specific task.

i Tools: Microsoft Copilot, Google Gemini, MetaGPT, Adobe Express, Canva, Open AI ChatGPT, Claude, Microsoft Azure AI Studio, Stable Diffusion.

ii Considerations for selecting a tool: purpose and functionality, ease of use, cost, updates and support, data privacy, security, quality, customizability, parameters available for output control.

### 1.6 Describe the limitations of Generative AI.

i Output is not reliable.

ii Output could include bias, misinformation, and hallucinations.

iii Needs processing power and access to the data (usually internet).

iv Conversations are used for training unless you enable privacy settings.

v No universal standards on how it should be used.

vi Limitations with consistency (two clocks, each show a different time).

vii Rapid changes might make previous work obsolete.

## 2. Basic Prompt Engineering

### 2.1 Identify appropriate prompts to elicit textual information.

i Content gathering.

ii Summarization.

iii Content creation and ideation.

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**2.2 Identify appropriate prompts to transform content.**

i Reformatting content to meet a requirement.

ii Editing and proofreading documents.

iii Providing a visualization of content.

iv Transforming content into a different media type.

v Translating content to a different language.

vi Personalizing and adapt content to facilitate learning and comprehension.

**2.3 Identify appropriate prompts to elicit image creation and transformation.**

i Producing an image for a specific purpose.

ii Exploring artistic ideas.

iii Transforming an image.

iv Describing the content of images.

**2.4 Identify appropriate prompts to elicit video creation and transformation.**

i Adding motion to images.

ii Interpolating between images.

iii Colorizing a black and white movie.

iv Generating video from a prompt.

v Generating an avatar that reads a script.

vi Adding and removing objects in a video.

vii Automated subtitling.

## 3. Prompt Refinement

**3.1 Given an initial prompt and its output, evaluate how the prompt can be improved to elicit more targeted output.**

i Content

- Creating a prompt at the right level of specificity.
- Creating prompts that are clear and not abbreviated.
- Not making the assumption that the AI will "know" what you're talking about.

ii Style

- Including information about the style and tone of the output.
- Including a style guide.

iii Persona

- Giving the AI a persona or role.

iv Context

- The AI needs to know the context for what it is asked to do; it's a machine, so it can't derive it naturally.

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**3.2 Given an initial prompt and its output, identify additional inputs you can use to elicit more targeted output.**

i Examples (few-shot prompting).

ii Glossary for translation.

iii Templates.

iv Documents to use for research.

v Earlier conversation in the same thread

**3.3 Recognize common prompting techniques.**

i Zero-shot, few-shot, chain-of-thought, self-consistency, generate knowledge, prompt chaining.

**3.4 Use reverse prompting techniques to achieve an outcome.**

**3.5 Given an AI output, explain how you can verify the accuracy of the output.**

i Historical facts.

ii Current facts.

iii Numerical data.

## 4. Ethics, Law, and Societal Impact

**4.1 Identify the potential for bias in Generative AI output.**

i AI can reflect the biases present in its training data.

ii Different models might have different biases.

iii The creator of the model introduces bias by adding guardrails.

- Some tools allow their additional guardrails to be turned on and off (Azure Open AI for example)

iv Bias can be introduced through the prompt.

v Common biases include gender, race, disability, age, religion, cultural, language, nationality, and economic status.

vi Generative AI can be used to propagate bias.

**4.2 Identify the potential legal implications of using Generative AI.**

i Honoring intellectual property rights

- The laws are still in flux however, the best approach is to use non-AI practices and not use another person's work without permission.
- Copyrighted data was used to train AI for some models.

ii Identifying legal implications of inappropriate use of generated content.

iii Transparency – documenting your process when using AI in a professional environment.

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### 4.3 Explain the importance of data privacy.

i Personal information or a company's private data could be used for training.

ii Identity theft might occur if personally identifiable information (PII) is used by Generative AI.

iii Identity theft could result in civil and criminal actions.

iv Companies are establishing internal policies to prevent employees from leaking data to public/unapproved AI models.

v Human-generated content might be used to train the model unless you opt out.

### 4.4 Determine the risks associated with using Generative AI.

i Necessity of human oversight to avoid spreading incorrect or harmful information that leaves you or the company vulnerable to financial and/or legal repercussions.

ii Understanding that you are responsible for what you create.

- Refraining from creating content that is harmful or could potentially lead to civil or criminal actions (bullying, hate crimes, fraud, stalking, cheating)
- Generative AI can be used for dangerous purposes, including deep fakes; easier to generate harmful or illegal information that looks real; identity theft.

### 4.5 Identify the impacts of Generative AI on society.

i Negative

- Recognizing the implications of the reduction of human interaction
- Recognizing that AI does not replace human contact
- Recognizing the possible impact on human motivation due to overreliance on AI
- Recognizing the human motivation to use AI to sway public opinion
- Fear that AI will take over our jobs and our humanity
- Socioeconomic factors – AI is not available to everyone equally

ii Positive

- Generative AI can help us do our job more efficiently.
- Help us communicate better, particularly across languages.
- Help us learn more effectively.
- Generate ideas to spark creativity; brainstorming.
- Help us do our life tasks more efficiently – menus, recipes, grocery list, summarize long messages from friends and family
- Analyze patterns and presenting them as opportunities
- Create jobs – they will just be different jobs

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