Here are 15 multiple-choice questions (MCQs) on Expansion patterns in generative AI, with the answers highlighted:

1. **Question:** What is an expansion pattern in generative AI?
   - A) A technique to reduce model size
   - B) A method to increase model performance
   - C) A strategy to generate diverse outputs
   - D) A way to decrease training time
   - **Answer:** C) A strategy to generate diverse outputs

2. **Question:** Which of the following is NOT a common expansion pattern?
   - A) Top-k sampling
   - B) Beam search
   - C) Greedy decoding
   - D) Random sampling
   - **Answer:** C) Greedy decoding

3. **Question:** What does top-k sampling do in expansion patterns?
   - A) Selects the top-k most likely tokens
   - B) Samples from the entire vocabulary
   - C) Ignores the top-k most likely tokens
   - D) Selects tokens randomly
   - **Answer:** A) Selects the top-k most likely tokens

4. **Question:** In beam search, what does the beam width parameter control?
   - A) The number of tokens to consider at each step
   - B) The number of beams to search
   - C) The length of the output sequence
   - D) The diversity of the generated outputs
   - **Answer:** B) The number of beams to search

5. **Question:** Which expansion pattern is prone to repetition in generated sequences?
   - A) Top-k sampling
   - B) Beam search
   - C) Greedy decoding
   - D) Random sampling
   - **Answer:** C) Greedy decoding

6. **Question:** What is the main drawback of using random sampling in expansion patterns?
   - A) It is computationally expensive
   - B) It can lead to low-quality outputs
   - C) It requires a large beam width
   - D) It is difficult to implement
   - **Answer:** B) It can lead to low-quality outputs

7. **Question:** Which expansion pattern is most likely to produce diverse outputs?
   - A) Top-k sampling
   - B) Beam search
   - C) Greedy decoding
   - D) Random sampling
   - **Answer:** A) Top-k sampling

8. **Question:** How does temperature affect the output of random sampling?
   - A) Higher temperature leads to more random outputs
   - B) Lower temperature leads to more random outputs
   - C) Temperature has no effect on random sampling
   - D) Higher temperature leads to more deterministic outputs
   - **Answer:** A) Higher temperature leads to more random outputs

9. **Question:** Which expansion pattern is most likely to produce fluent, grammatically correct outputs?
   - A) Top-k sampling

- B) Beam search
- C) Greedy decoding
- D) Random sampling
- **Answer:** B) Beam search

10. **Question:** How does nucleus sampling differ from top-k sampling?
- A) Nucleus sampling uses a dynamic k value
- B) Nucleus sampling ignores the top-k most likely tokens
- C) Nucleus sampling samples from the entire vocabulary
- D) Nucleus sampling considers the top-k most likely tokens within a cumulative probability threshold
- **Answer:** D) Nucleus sampling considers the top-k most likely tokens within a cumulative probability threshold

11. **Question:** Which expansion pattern is most computationally efficient?
- A) Top-k sampling
- B) Beam search
- C) Greedy decoding
- D) Random sampling
- **Answer:** C) Greedy decoding

12. **Question:** In what scenario would you prefer to use beam search over top-k sampling?
- A) When generating creative text
- B) When generating diverse text
- C) When generating fluent text
- D) When generating text with limited repetition
- **Answer:** D) When generating text with limited repetition

13. **Question:** How does beam search handle the issue of repetition in generated sequences?
- A) By penalizing repeated tokens
- B) By increasing the beam width
- C) By ignoring repeated tokens

- D) By sampling from a different distribution
- **Answer:** A) By penalizing repeated tokens

14. **Question:** Which expansion pattern is most suitable for generating text with a specific style or tone?
- A) Top-k sampling
- B) Beam search
- C) Greedy decoding
- D) Random sampling
- **Answer:** A) Top-k sampling

15. **Question:** How does nucleus sampling address the issue of diversity in generated sequences?
- A) By penalizing repeated tokens
- B) By sampling from a diverse subset of tokens
- C) By increasing the beam width
- D) By sampling from a different distribution
- **Answer:** B) By sampling from a diverse subset of tokens