

1.	B
2.	C
3.	B
4.	C
5.	B
6.	B
7.	C
8.	C
9.	B
10.	B
11.	B
12.	B
13.	B

1. What is the main goal of optimization?

- A) To find any solution
- B) To find the best solution
- C) To complicate problems
- D) To ignore constraints

2. In optimization, what is an objective function?

- A) The input values
- B) A constraint on variables
- C) The function to be maximized or minimized
- D) The method used for solving

3. The first derivative test is used to identify:

- A) Global maxima
- B) Local maxima and minima
- C) Absolute extrema
- D) Inflection points

4. What does a positive derivative indicate about a function?

- A) The function is decreasing
- B) The function is constant
- C) The function is increasing
- D) The function has no extrema

5. Which of the following is a common cost function in machine learning?

- A) Absolute error
- **B) Mean squared error**
- C) Logarithmic error
- D) Hinge loss

6. What is the primary purpose of gradient descent?

- A) To find the exact solution
- **B) To minimize a function**
- C) To graph functions
- D) To compute derivatives

7. Which condition must a function satisfy for gradient descent to be effective?

- A) It must be constant
- B) It must be discontinuous
- **C) It must be differentiable**
- D) It must be linear

8. When does a local maximum occur?

- A) When the function is increasing
- B) At the highest point in the entire domain
- **C) At a point higher than its neighboring points**
- D) When the derivative is positive

9. What does the term "Global extrema" refer to?

- A) Local maxima and minima
- **B) Highest and lowest points over the entire domain**
- C) Points where the function is undefined
- D) Critical points only

10. Which of the following algorithms is commonly used to minimize cost functions in machine learning?

- A) Genetic Algorithm
- **B) Gradient Descent**
- C) Simulated Annealing
- D) K-Means Clustering

11. What happens if the step size in gradient descent is too large?

- A) The algorithm will converge faster
- **B) It may overshoot the minimum**
- C) It will guarantee a global minimum
- D) The algorithm will fail to start

12. What does the term "stochastic" imply in Stochastic Gradient Descent?

- A) Using the entire dataset for each update
- **B) Using a random datapoint for updates**
- C) Having a fixed learning rate
- D) Ensuring global convergence

13. Which of the following is a disadvantage of stochastic gradient descent?

- A) It is computationally expensive
- **B) It may not reach the global minimum**
- c) It uses too much memory