X

Unit 6 - Week 4

Assignment 4

The due date for submitting this assignment has passed. Due on 2020-02-26, 23:59 IST.
As per our records you have not submitted this assignment.

1) Consider $f(x)$, if x is the decision variable and f is a function to be minimized, then the type of optimization problem is ***1 point***

- Constrained optimization
- Unconstrained optimization
- Discrete optimization
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
Unconstrained optimization

2) Match the following ***1 point***

I. $\min_{\bar{x}} f(\bar{x})$	a. Equality constraints
II. $s.t\ h(\bar{x}) = \mathbf{0}$	b. Objective function
III. $g(\bar{x}) > \mathbf{0}$	c. Inequality constraints

- I - a, II - b , III - c

- I - b , II - a , III - c
- I - a, II - c , III - b
- I - c, II - a , III - b

No, the answer is incorrect.
Score: 0
Accepted Answers:
I - b , II - a , III - c

3) In univariate unconstrained optimization the decision variables can be **1 point**

- Continuous
- Integral
- Continuous or Integral
- Not defined

No, the answer is incorrect.
Score: 0
Accepted Answers:
Continuous or Integral

4) State whether the following statements are true or false with respect to Linear programming problem **1 point**

I. Decision variables are continuous
II. Objective function is linear
III. Constraints are nonlinear

- I - True , II - True , III - False
- I - True , II - True , III - True
- I - False , II - False , III - False
- I - False , II - True , III - True

No, the answer is incorrect.
Score: 0
Accepted Answers:
I - True , II - True , III - False

5) If $f(\bar{x})$ is **QUADRATIC** function of $\bar{x}$ and $g(\bar{x}), h(\bar{x})$ are **LINEAR** functions of $\bar{x}$, then the type of optimization problem is **1 point**

- dual linear programming
- linear programing
- quadratic programming
- none of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
quadratic programming

6) The maximization of a function $f(\bar{x})$ is equal to the minimization of the function **1 point**

- $-f(\bar{x})$
- $f'(\bar{x})$
- $f''(\bar{x})$

- $-f''(\bar{x})$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$-f(\bar{x})$

7) For an unconstrained optimization problem given below, ***1 point***

$$\min_x f(x)$$

for x^*, to be the minimizer of $f(x)$, the second order necessary condition is

- $f'(x) > 0$
- $f''(x) < 0$
- $f''(x) > 0$
- $f'(x) = 1$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$f''(x) > 0$

8) If $f(x) = 3x^4 + 2x^3 + 3x^2 + 3$, then the first order necessary condition for either maxima or minima of $f(x)$ is ***1 point***

- $12x^3 + 6x^2 + 3x = 0$
- $12x^3 + 6x^2 + 6x = 0$
- $3x^4 + 2x^3 + 3x^2 = 0$
- $8x^3 - 18x^2 - 24x = 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$12x^3 + 6x^2 + 6x = 0$

9) For a function $f(x) = x^3 - 12x^2 + 48x - 64 = 0$, which of the following numbers is a stationary point of $f(x)$ ***1 point***

- 2
- 4
- 1
- -1

No, the answer is incorrect.
Score: 0
Accepted Answers:
4

10) If a function is strictly increasing what is the minima value? **1 point**

- 0
- -1
- -∞
- 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
-∞

11) If the derivative of the objective function is a polynomial of order 'N' and has roots which are repeated thrice, then how many stationary points exist for the objective function? **1 point**

- N-1
- N-3
- N-2
- N

No, the answer is incorrect.
Score: 0
Accepted Answers:
N-2

12) For any two points x_1 and x_2 in $[a, b]$ and any λ where $0 < \lambda < 1$ the convex function is given by **1 point**

- $f[\lambda x_1 + (1-\lambda)x_2] \leq \lambda f(x_1) + (1-\lambda) f(x_2)$
- $f[\lambda x_1 + (1-\lambda)x_2] \geq \lambda f(x_1) + (1-\lambda) f(x_2)$
- $f[\lambda x_1 + (\lambda)x_2] \geq \lambda f(x_1) + (1-\lambda) f(x_2)$
- $f[\lambda x_1 + (1-\lambda)x_2] \leq \lambda f(x_1) + (1+\lambda) f(x_2)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$f[\lambda x_1 + (1-\lambda)x_2] \leq \lambda f(x_1) + (1-\lambda) f(x_2)$

13) Consider a univariate optimization function $f(x)$. If the function satisfies the first order condition and gives an output of the minimum value -5 and the second-order condition gives an output of the minimum value -7. In this which of the following value would be considered as a global minimum of $f(x)$ **1 point**

- -5
- -7
- -12
- 2

No, the answer is incorrect.
Score: 0
Accepted Answers:
-7

14) **1 point**

Which of the following statements are true in the univariate optimization?

I. The function f has only one decision variable
II. x is a vector variable

- Only I is true
- Only II is true
- Both I and II is true
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Only I is true

15) For a function $f(x) = x^4 - 3x^3 + x^2 + 23$, stationary points which are qualified to be minimizers of $f(x)$ are ***1 point***

- 0,2
- 0,-2.5
- 0.25,2
- 2,-2.5

No, the answer is incorrect.
Score: 0

Accepted Answers:
0,2