X

Unit 6 - Week 5

Week 5 Assignment 5

The due date for submitting this assignment has passed. **Due on 2018-09-12, 23:59 IST.**
As per our records you have not submitted this assignment.

1) ***1 point***

Which one of the following statements is true with regard to Non-linear Programming?

i. Linearity assumption will be always valid
ii. Additivity assumption will be always valid
iii. Constant returns to scale will be always valid
iv. All of the above statements are false

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv.

2) ***1 point***

For a Non-linear Programming problem:

i. Optimal solution will always lie in a corner point of the feasible solution space
ii. Optimal solution will never lie in a corner point of the feasible solution space
iii. Optimal solution may not lie in a corner point of the feasible solution space
iv. None of the above

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii.

3) For an Unconstrained Non-linear Programming problem: ***1 point***

i. Objective function is non-linear and the constraints are linear
ii. Objective function is linear and the constraints are nonlinear
iii. Objective function is non-linear and there are no constraints
iv. None of the above

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.

Score: 0

Accepted Answers:

iii.

4) ***1 point***

Which of the following is not true for a Convex Function

i. 2nd derivative must be positive
ii. Global maximum should be possible to have
iii. Curving upward or not curving at all
iv. Curving downward

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:

iv.

5) ***1 point***

Suppose we need to find optimal value for x for the problem: $Max\ f(x) = 4x - 2x^3 - 6x^4$ T the following necesssary condition must be satisfied

i. $4 + 6x^2 - 24x^3 = 0$
ii. $4 - 6x^2 - 24x^3 = 0$
iii. $12x + 72x^2 < 0$
iv. $-12x - 72x^2 < 0$

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:

ii.

6) ***1 point***

Suppose we need to find optimal value for x for the problem: $Max\ f(x) = 4x - 2x^3 - 6x^4$ Tl the following sufficient condition must be satisfied

i. $4 + 6x^2 - 24x^3 = 0$
ii. $4 - 6x^2 - 24x^3 = 0$
iii. $12x + 72x^2 < 0$
iv. $-12x - 72x^2 < 0$

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv.

7) ***1 point***

See the following function: $df(x)/dx = 6 - 4x^3 - 8x^5$
Consider one dimensional search procedure, where initial values for 1st iteration are: 0 ar
The trial solution used for 1^{st} iteration will then be:

i. 0
ii. 1
iii. 2
iv. 3

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

8) ***1 point***

See the following function: $df(x)/dx = 6 - 4x^3 - 8x^5$
Consider one dimensional search procedure, where initial values for 1st iteration are: 0 a
What will be the new set of initial values after 1^{st} iteration?

i. 0 and 1
ii. 1 and 2
iii. 0 and 0.5
iv. 0 and 2

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

9) For a multi-variable unconstrained NLP, Max f(x1, x2, x3) = 4x1x2 – $2x2^3$ – $6x3^4$ Gradient is a vector of: ***1 point***

- i. First order derivatives of the function with respect of x1, x2, x3
- ii. Second order derivatives of the function with respect of x1, x2, x3
- iii. First order partial derivatives of the function with respect of x1, x2, x3
- iv. Second order partial derivatives of the function with respect of x1, x2, x3

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii. First order partial derivatives of the function with respect of x1, x2, x3

10) For a multi-variable unconstrained NLP, Max f(x1, x2, x3) = 4x1x2 – $2x2^3$ – $6x3^4$ The Hessian Matrix is: ***1 point***

- i. A matrix of First order derivatives
- ii. A matrix of second order derivatives
- iii. A square matrix of First order partial derivatives

iv. A square matrix of second order partial derivatives

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv. A square matrix of second order partial derivatives

11) For a multi-variable unconstrained NLP, $Max\ f(x1, x2, x3) = 4x1x2 - 2x2^3 - 6x3^4$ **1 point**
Optimal solution can be found if

i. Gradient is equated to zero and Hessian Matrix is negative definite
ii. Gradient is greater than zero and Hessian Matrix is positive definite
iii. Gradient is less than zero and Hessian Matrix is negative definite
iv. Gradient is equated to zero and Hessian Matrix is positive definite

i.
ii.
iii.
iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

12) **1 point**
All the eigenvalues of the Hessian Matrix are found to be either zero or negative. The Hes Matrix will be:

i. Positive Semidefinite
ii. Negative Semidefinite
iii. Positive Definite
iv. Negative Definite

i.
ii.
iii.
iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

13) **1 point**
Suppose $f(x) = 2x1^2 + 4x2^2$. The Hessian Matrix will be:

i. Positive Definite
ii. Negative Definite
iii. Positive Semidefinite
iv. Negative Semidefinite

i.
ii.
iii.
iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

14) **1 point**

We need to solve the following by using Newton's Method: $Max\ f(x) = 6x - 3x^2 - 2x^4$
A starting solution for the first iteration for x (i.e. $x1$) is taken to be 1.

What would be values of $f'(x1)$ and $f''(x1)$ for the first iteration with $x1 = 1$.

i. −8, 18
ii. −8, −30
iii. 12, −24
iv. −12, −24

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

15) **1 point**

Consider Question 14 again. What will be the value of x (i.e. $x2$) for the 2nd iteration?

i. 0.733
ii. 0.524
iii. 0.958
iv. 0.484

- i.
- ii.
- iii.
- iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

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