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Courses » Surrogates and Approximations in Engineering Design

Announcements   **Course**   Ask a Question   Progress   Mentor   FAQ

Unit 3 - Week 1

Assignment 1

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.   **Due on 2018-09-05, 23:59 IST.**

1) Maximization of $f(x)$ is equivalent to   ***1 point***

○ Minimization of $-f(x)$

○ Minimization of $\frac{1}{f(x)}$

○ Both of (i) and (ii)

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Minimization of $-f(x)$

2) Minimize $f(x_1, x_2) = x_1 + 2x_2 - 4$ subject to $2x_1 + x_2 \leq 4, x_1 \geq 0, x_2 \geq 0$ ***1 point***

○ $f(x_1, x_2) \approx -4$

○ $f(x_1, x_2) \approx 9$

○ $f(x_1, x_2) \approx 0$

○ The problem is infeasible

No, the answer is incorrect.
Score: 0

Accepted Answers:
$f(x_1, x_2) \approx -4$

3) Feasible design can violate   ***1 point***

○ "$\leq$" type constraints

○ "$\geq$" type constraints

○ "=" type constraints

○ None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of these

4) The number of active inequality constraints at the optimum   ***1 point***

○ Must be larger than the number of design variables

○ Can be less than or equal to the number of design variables

○ No restriction on the number of active inequality constraints

○ Must be equal to the number of design variables

No, the answer is incorrect.
Score: 0

Accepted Answers:
Can be less than or equal to the number of design variables

5) A function $f(x)$ can have   *1 point*

○ Only one global minimum point.

○ Several local optima in a small neighborhood of **x***

○ More than one global minimum point.

○ Only one local minimum point.

No, the answer is incorrect.
Score: 0

Accepted Answers:
More than one global minimum point.

6) Hessian matrix of a discontinuous function can be   *1 point*

○ Symmetric

○ Asymmetric

○ Identity

○ Cannot be defined

No, the answer is incorrect.
Score: 0

Accepted Answers:
Cannot be defined

7) Write taylor's expansion for e^x in terms of $x^* = 1$ at the point   *0 points*

○
$e^x = 1 + x + 0.5x^2$

○
$e^x = 7.389 - 7.389x + 3.6945x^2$

○
$e^x = 2.7183 - 2.7183x + 1.3591x^2$

○ Cannot be defined

No, the answer is incorrect.
Score: 0

Accepted Answers:
$e^x = 2.7183 - 2.7183x + 1.3591x^2$

8) Determine the nature of the quadratic equation $f(x) = x_1^2 - x_2^2 + x_3^2 - 2x_2x_3$ *1 point*

○ Positive definite

○ Indefinite

○ Positive semi definite

○ Negative definite

No, the answer is incorrect.
Score: 0

Accepted Answers:

Indefinite

9) A point satisfying the first order conditions of Lagrange multiplier theorem   *1 point*

○ Need not to be a minimum point

○ Can be a local minimum point

○ Can be an inflection point

○ All of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of these

10) If the boundary of an active constraint is changed by one unit, the location of the optimum   *1 point*
point

○ Doesn't change

○ Depends on the function, it may or may not change

○ It will change

○ ii and iii

No, the answer is incorrect.
Score: 0

Accepted Answers:
Depends on the function, it may or may not change

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