Unit 5 - Week-4

Assignment 4

The due date for submitting this assignment has passed. **Due on 2018-09-26, 23:59 IST.**
As per our records you have not submitted this assignment.

1) *Taking* $X_1 = (0,0)^T$ *as the initial guess for the problem* *1 point*
$\min\ f(x_1,x_2) = 4x_1^2 - 2x_1x_2 + x_2^2 + 3x_1 + 5,\ (x_1,x_2) \in \mathbb{R}^2,$
X_2 *(the next iterative point) obtained by steepest method is*

- $(0,0)^T$
- $(-\frac{3}{8},0)^T$
- $(-\frac{1}{4},0)^T$
- $(-1,0)^T$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(-\frac{3}{8},0)^T$

2) *Consider the problem :* $\min\ f(x_1,x_2) = 8x_1^2 - 4x_1x_2 + 5x_2^2,\ (x_1,x_2) \in \mathbb{R}^2.$ *1 point*
Taking $X_0 = (5,2)^T$ *(as initial guess) and* X_1, *(the point obtained in the next iteration), using Newton's method, then* $X_1 - X_0$ *equals*

- $(-5,-2)^T$
- $(5,2)^T$
- $(-1,-2)^T$
- $(1,2)^T$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(-5,-2)^T$

3) *The direction* $(a,b)^T$ *conjugate to* $(-1,2)^T$ *with respect to the matrix* *1 point*
$Q = \begin{bmatrix} 2 & 1 \\ 1 & 4 \end{bmatrix}$ *will satisfy the equation*

- $(0,1)^T$
- $(1,1)^T$
- $(2,1)^T$
- $(1,0)^T$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(1,0)^T$

4) *1 point*
Using the conjugate gradient method to $\min f(x_1,x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2,\ (x_1,x_2) \in \mathbb{R}^2,\ X_0 = (0,0)^T,\ X_2$ *(the second iterati*

- $\left(-1,\frac{3}{2}\right)^T$
- $\left(\ ,\ 3\ \right)^T$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\left(-1, \frac{3}{2}\right)^T$

5) Which of the following is NOT a unimodal function? 1 point

- $\max f(x) = \begin{cases} 6x & \text{if } 0 \le x \le 2, \\ 16 - 2x & \text{if } 2 \le x \le 4 \end{cases} \quad in\ [0,4]$
- $\max f(x) = \begin{cases} x & \text{if } 0 \le x \le 1, \\ -2x + 3 & \text{if } 1 \le x \le 1.5 \end{cases} \quad in\ [0,1.5]$
- $\min f(x) = \begin{cases} x, & \text{if } 0 \le x \le 2, \\ x - 2, & \text{if } 2 \le x \le 4 \end{cases} \quad in\ [0,4]$
- $\min f(x) = \begin{cases} -2x, & \text{if } 0 \le x \le 2, \\ x - 6, & \text{if } 2 \le x \le 6 \end{cases} \quad in\ [0,6]$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\min f(x) = \begin{cases} x, & \text{if } 0 \le x \le 2, \\ x - 2, & \text{if } 2 \le x \le 4 \end{cases} \quad in\ [0,4]$

6) *The next interval while maximizing* $f(x) = \begin{cases} 2x & \text{if } 0 \le x \le 1.5, \\ -x + 4.5 & \text{if } 1.5 \le x \le 3 \end{cases}$ 1 point
using Fibonacci search technique, taking $n = 4$ *is*

- [0,1.8]
- [1.2,3]
- [0, 1.2]
- [1.8,3]

No, the answer is incorrect.
Score: 0

Accepted Answers:
[1.2,3]

7) *Consider the problem :* $\min\ f(x) = x(x-3)$ *in the interval* $[0,2]$. 1 point
Using Dichotomous search method, the first two experiments obtained using a value of $\delta = 0.001$, *are*

- 0.4445, 0.9995
- 0.9995, 2
- 0, 0.9995
- 0.9995, 1.0005

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.9995, 1.0005

8) *Let* $f : [-5,15] \longrightarrow \mathbb{R}$ *be a unimodal min function with* $f(7) = 12$ *and* $f(13) = 10$, 1 point
then the point x_{min} *lies in the interval*

- [7,15]
- [-5,13]
- [-5,7]
- [7,13]

No, the answer is incorrect.
Score: 0

Accepted Answers:
[7,15]

9) 1 point
An investor has 4000 *Rs. to invest. This amount can be invested in any of the three ventures* A, B *and* C *available to him. But he must invest in units of* 1000 *Rs.*
The potential return from investment in any one venture depends upon the amount invested according to the following table
The maximum potential return is

- 4
- 4.3
- 4.5
- 5.4

No, the answer is incorrect.
Score: 0

Accepted Answers:
4.5

10) *The optimal value of the problem* 1 point
$\max z = xy$
$s/t\ 2x + y = 12,$
$x, y \ge 0.$
(using dynamic programming), is

- 12
- 18

22

28

No, the answer is incorrect.
Score: 0

Accepted Answers:
18

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