Assignment 2

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Deadline: 2021-02-07, 23:59 IET.

Question 1 (Score 1.0 point)
1. For an optimization problem, if the local minimum is unique, then it is also global minimum.
   - True
   - False
   - No, the answer is incorrect.
   - Acceptable Answers: True

2. For the function $f(x) = x^2$ on $\mathbb{R}$, the global minimum is unique.
   - True
   - False
   - No, the answer is incorrect.
   - Acceptable Answers: True

3. Consider the following function for $x \in (-\infty, -3]$. How many global minima does this function have?
   - True
   - False
   - No, the answer is incorrect.
   - Acceptable Answers: False

Question 2 (Score 2.0 point)
Consider the following functions with their respective domains. Answer YES or NO if it is a necessity that the answer can be applied in this case:

4. $f(x) = \frac{1}{x}$, for $x \in [-1, 0]$
   - YES
   - NO
   - No, the answer is incorrect.
   - Acceptable Answers: NO

5. $f(x) = x^2$, for $x \in [0, 10]$;
   - YES
   - NO
   - No, the answer is incorrect.
   - Acceptable Answers: YES

6. $f(x) = x^2$, for $x \in [-1, 9]$
   - YES
   - NO
   - No, the answer is incorrect.
   - Acceptable Answers: YES

Question 3 (Score 1.0 point)
Consider positive definite $p$, positive semidefinite $p$ for the following matrices:

<table>
<thead>
<tr>
<th>$P$</th>
<th>$Q$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

1. $P$ is positive definite.
   - True
   - False
   - No, the answer is incorrect.
   - Acceptable Answers: True

2. $Q$ is positive semidefinite.
   - True
   - False
   - No, the answer is incorrect.
   - Acceptable Answers: False

Question 4 (Score 1.0 point)
Consider the following function $f(x, y) = \frac{1}{x^2 + y^2}$ in $\mathbb{R}^2$. What is the value of $f(x, y)$ at $(1, 0)$?
   - $0$
   - $\frac{1}{2}$
   - $\frac{1}{4}$
   - $\frac{1}{8}$
   - No, the answer is incorrect.
   - Acceptable Answers: $\frac{1}{8}$

Question 5 (Score 1.0 point)
Consider the set $C = \{x, y \mid f(x, y) = 0\}$. What is the cardinality of $C$?
   - 0
   - 1
   - 2
   - 3
   - No, the answer is incorrect.
   - Acceptable Answers: 2

Question 6 (Score 1.0 point)
Consider the following function $f(x, y) = x^2 + y^2$ in $\mathbb{R}^2$. What is the value of $f(x, y)$ at $(1, 0)$?
   - $0$
   - $1$
   - $2$
   - $3$
   - No, the answer is incorrect.
   - Acceptable Answers: $1$