King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 Section 19 Quiz V (Term 151)

Name : ..... **ID** #..... Serial #: .....
(Version 1)

1. The sum of the absolute maximum and the absolute minimum values of the function $f(x) = 2\cos x + 2\cos^2 x,\ \frac{\pi}{2} \le x \le 2\pi$ is

   a) -2
   b) $\frac{-1}{2}$
   c) $\frac{7}{2}$
   d) 4

2. The sum of all critical numbers of the function $f(x) = \frac{(x-4)^2}{\sqrt[3]{x+1}}$ is

   a) -8
   b) 2
   c) 3
   d) 12

3. If $f(5) = \dfrac{-5}{2}$ and $f'(x) \geq \dfrac{-1}{2}$ for $3 \leq x \leq 5$, then the largest possible value of $f(3)$ is:

a) $\dfrac{-7}{2}$

b) $\dfrac{-5}{2}$

c) $\dfrac{-3}{2}$

d) $\dfrac{-1}{2}$

4. Let $f(x) = \alpha\, x^2 + \beta\, x + \gamma$, where $\alpha \neq 0$, β, γ are constants. The value of c that satisfies the conclusion of the **Mean Value Theorem** for f on the interval $[3, 7]$ is:

a) 2

b) 3

c) 4

d) 5

5. The function $f(x) = x^4 - 4x^3 + 4x^2 + 4$ has

a) a local maximum at $x = 1$ and a local minimum at $x = 0$ and $x = 2$
b) a local minimum at $x = 1$ and a local maximum at $x = 0$ and $x = 2$
c) a local minimum at $x = -2$ and $x = 0$ and a local maximum at $x = -1$
d) a local maximum at $x = -2$ and $x = 0$ and a local minimum at $x = -1$

6. Let $f(x) = x^4 - 4x^3$. Which one of the following statements is **TRUE?**

a) The graph of f is concave up on $(-\infty, 0) \cup (2, \infty)$
b) The graph of f is concave up on $(-\infty, -2) \cup (0, \infty)$
c) The graph of f is concave up on $(-\infty, 0) \cup (1, \infty)$
d) The graph of f is concave up on $(-\infty, -1) \cup (0, \infty)$

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 Section 19 Quiz V (Term 151)

Name : ..... **ID** #..... Serial #: .....
(Version 2)

1. The absolute maximum of the function $f(x) = 2\cos x + 2\cos^2 x,\ \frac{\pi}{2} \leq x \leq 2\pi$ is

   a) -2
   b) $\frac{-1}{2}$
   c) $\frac{7}{2}$
   d) 4

2. The sum of all critical numbers of the function $f(x) = \frac{(x+7)^2}{\sqrt[3]{x+2}}$ is

   a) -8
   b) 2
   c) 3
   d) 12

3. If $f(5) = \dfrac{-3}{2}$ and $f'(x) \geq \dfrac{-1}{2}$ for $3 \leq x \leq 5$, then the largest possible value of $f(3)$ is:

a) $\dfrac{-7}{2}$

b) $\dfrac{-5}{2}$

c) $\dfrac{-3}{2}$

d) $\dfrac{-1}{2}$

4. Let $f(x) = \alpha\, x^2 + \beta\, x + \gamma$, where $\alpha \neq 0$, β, γ are constants. The value of c that satisfies the conclusion of the **Mean Value Theorem** for f on the interval $[1, 3]$ is:

a) 2

b) 3

c) 4

d) 5

5. The function $f(x) = -x^4 + 4x^3 - 4x^2 - 4$ has

a) a local maximum at $x = 1$ and a local minimum at $x = 0$ and $x = 2$
b) a local minimum at $x = 1$ and a local maximum at $x = 0$ and $x = 2$
c) a local minimum at $x = -2$ and $x = 0$ and a local maximum at $x = -1$
d) a local maximum at $x = -2$ and $x = 0$ and a local minimum at $x = -1$

6. Let $f(x) = x^4 + 4x^3$. Which one of the following statements is **TRUE?**

a) The graph of f is concave up on $(-\infty, 0) \cup (2, \infty)$
b) The graph of f is concave up on $(-\infty, -2) \cup (0, \infty)$
c) The graph of f is concave up on $(-\infty, 0) \cup (1, \infty)$
d) The graph of f is concave up on $(-\infty, -1) \cup (0, \infty)$

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 Section 19 Quiz V (Term 151)

Name : ..... **ID** #..... Serial #: .....
(Version 3)

1. The absolute minimum values of the function $f(x) = 2\cos x + 2\cos^2 x,\ \frac{\pi}{2} \leq x \leq 2\pi$ is

   a) -2
   b) $\frac{-1}{2}$
   c) $\frac{7}{2}$
   d) 4

2. The sum of all critical numbers of the function $f(x) = \frac{(x-8)^2}{\sqrt[3]{x+2}}$ is

   a) -8
   b) 2
   c) 3
   d) 12

3. If $f(5) = \dfrac{-5}{2}$ and $f'(x) \geq \dfrac{1}{2}$ for $3 \leq x \leq 5$, then the largest possible value of $f(3)$ is:

a) $\dfrac{-7}{2}$

b) $\dfrac{-5}{2}$

c) $\dfrac{-3}{2}$

d) $\dfrac{-1}{2}$

4. Let $f(x) = \alpha\, x^2 + \beta\, x + \gamma$, where $\alpha \neq 0$, β, γ are constants. The value of c that satisfies the conclusion of the **Mean Value Theorem** for f on the interval $[1, 5]$ is:

a) 2

b) 3

c) 4

d) 5

5. The function $f(x) = x^4 + 4x^3 + 4x^2 + 4$ has

a) a local maximum at $x = 1$ and a local minimum at $x = 0$ and $x = 2$
b) a local minimum at $x = 1$ and a local maximum at $x = 0$ and $x = 2$
c) a local minimum at $x = -2$ and $x = 0$ and a local maximum at $x = -1$
d) a local maximum at $x = -2$ and $x = 0$ and a local minimum at $x = -1$

6. Let $f(x) = x^4 - 2x^3$. Which one of the following statements is **TRUE?**

a) The graph of f is concave up on $(-\infty, 0) \cup (2, \infty)$
b) The graph of f is concave up on $(-\infty, -2) \cup (0, \infty)$
c) The graph of f is concave up on $(-\infty, 0) \cup (1, \infty)$
d) The graph of f is concave up on $(-\infty, -1) \cup (0, \infty)$

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 Section 19 Quiz V (Term 151)

Name : ..... **ID** #..... Serial #: .....
(Version 4)

1. The product of the absolute maximum and the absolute minimum values of the function $f(x) = 2\cos x + 2\cos^2 x,\ \frac{\pi}{2} \leq x \leq 2\pi$ is

   a) -2
   b) $\frac{-1}{2}$
   c) $\frac{7}{2}$
   d) 4

2. The sum of all critical numbers of the function $f(x) = \frac{(x-9)^2}{\sqrt[3]{x-4}}$ is

   a) -8
   b) 2
   c) 3
   d) 12

3. If $f(5) = \dfrac{-3}{2}$ and $f'(x) \geq \dfrac{1}{2}$ for $3 \leq x \leq 5$, then the largest possible value of $f(3)$ is:

a) $\dfrac{-7}{2}$

b) $\dfrac{-5}{2}$

c) $\dfrac{-3}{2}$

d) $\dfrac{-1}{2}$

4. Let $f(x) = \alpha\, x^2 + \beta\, x + \gamma$, where $\alpha \neq 0$, β, γ are constants. The value of c that satisfies the conclusion of the **Mean Value Theorem** for f on the interval $[3, 5]$ is:

a) 2

b) 3

c) 4

d) 5

5. The function $f(x) = -x^4 - 4x^3 - 4x^2 - 4$ has

a) a local maximum at $x = 1$ and a local minimum at $x = 0$ and $x = 2$
b) a local minimum at $x = 1$ and a local maximum at $x = 0$ and $x = 2$
c) a local minimum at $x = -2$ and $x = 0$ and a local maximum at $x = -1$
d) a local maximum at $x = -2$ and $x = 0$ and a local minimum at $x = -1$

6. Let $f(x) = x^4 + 2x^3$. Which one of the following statements is **TRUE?**

a) The graph of f is concave up on $(-\infty, 0) \cup (2, \infty)$
b) The graph of f is concave up on $(-\infty, -2) \cup (0, \infty)$
c) The graph of f is concave up on $(-\infty, 0) \cup (1, \infty)$
d) The graph of f is concave up on $(-\infty, -1) \cup (0, \infty)$