Quiz questions of cal-I from chapter 4.2-4.4

Ques. 1: Identify the interval on which $f(x) = 2x^3 - 3x^2 - 12x$ is increasing

(a) $(1, 2)$

(b) $(-1, 2)$

(c) $(-\infty, 1) \cup (2, \infty)$

(d) $(-\infty, -1) \cup (2, \infty)$

Ques. 2: If $f(1) = 10$ and $f'(x) \geq 2$ for $1 \leq x \leq 4$ then find the smallest possible value of $f(4)$.

(a) 14

(b) 15

(c) 16

(d) 18

Ques. 3: Absolute maximum value of the function $f(x) = x^3 - 3x + 1$ in the interval $[0, 3]$ is

(a) -1

(b) 3

(c) 18

(d) 19

Ques. 4: The interval of concave upward is of the function $f(x) = x^2 \ln x$ is

(a) $(e^{\frac{1}{2}}, \infty)$

(b) $(e^{-\frac{3}{2}}, \infty)$

(c) $(e^{\frac{3}{2}}, \infty)$

(d) $(e^{\frac{-1}{2}}, \infty)$

Ques. 5: Find the local maximum and local minimum values for the function $h(x) = 5x^3 - 3x^5$.

(a) 2,-2 respectively

(b) 3, -3 respectively

(c) -3, 3 respectively

(d) -2, 2 respectively

Ques. 6: Find the local maximum and local minimum values for the function $f(x) = \sin x + \cos x$, $0 \le x \le 2\pi$

(a) $-\sqrt{2}$, $\sqrt{2}$ respectively

(b) $\sqrt{2}$, $-\sqrt{2}$ respectively

(c) $\sqrt{3}$, $-\sqrt{3}$ respectively

(d) $-\sqrt{3}$, $\sqrt{3}$ respectively

Ques. 7: If the function $f(x) = 2x^2 - 3x + 1$ satisfies the hypothesis of the mean value theorem on the interval $[0, 2]$ then find the number 'c' that satisfy the conclusion of the mean value theorem.

(a) 0

(b) 1

(c) -1

(d) 2

Ques. 8: If the function $f(x) = x^3 - x^2 - 6x + 2$ satisfies Rolle's theorem on the interval $[0, 3]$ then find the number 'c' that satisfy the conclusion of the Rolle's theorem

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(a) $\frac{-1-\sqrt{19}}{3}$

(b) $\frac{-1+\sqrt{19}}{3}$

(c) $\frac{1\pm\sqrt{19}}{3}$

(d) $\frac{-1\pm\sqrt{19}}{3}$

Ques. 9: If the function $f(x) = e^{-2x}$ satisfies Mean value theorem on the interval $[0, 3]$ then find the number 'c' that satisfy the conclusion of the Mean value theorem.

(a) $-\frac{1}{2}\ln[\frac{1}{6}(1-e^{-6})]$

(b) $\frac{1}{2}\ln[\frac{1}{6}(1-e^{-6})]$

(c) $\frac{1}{2}\ln[\frac{1}{6}(1+e^{-6})]$

(d) $-\frac{1}{2}\ln[\frac{1}{6}(1+e^{-6})]$

Ques. 10: The value of $\lim_{x\to\infty} x\tan\frac{1}{x}$ is

(a) 1

(b) 0

(c) ∞

(d) -1

Ques. 11: The value of $\lim_{x\to\infty}\frac{(\ln x)^2}{x}$ is

(a) ∞

(b) 1

(c) 0

(d) -∞

Ques. 12: The value of $\lim_{x\to\frac{\pi}{2}^+}\frac{\cos x}{1-\sin x}$ is

(a) 0

(b) -∞

(c) ∞

(d) 1

Ques. 13: The value of $\lim_{x\to 1}(\frac{x}{x-1}-\frac{1}{\ln x})$ is

(a) 1

(b) 0

(c) $-\frac{1}{2}$

(d) $\frac{1}{2}$

Ques. 14: The value of $\lim_{x\to 0^+}(\cos x)^{\frac{1}{x^2}}$ is

(a) ∞

(b) 1

(c) -1

(d) 0

Ques. 15: Use L' Hospital rule to evaluate $\lim_{x\to\infty} x^3 e^{-x^2}$.

(a) 0

(b) 1

(c) -1

(d) ∞

Ques. 16: Use L' Hospital rule to evaluate $\lim_{x\to\infty} \frac{\ln \ln x}{x}$.

(a) 1

(b) -1

(c) 0

(d) ∞

Ques. 17: Use L' Hospital rule to evaluate $\lim_{t\to 0} \frac{e^{2t}-1}{\sin t}$.

(a) 0

(b) 1

(c) 2

(d) ∞

Ques. 18: Use L' Hospital rule to evaluate $\lim_{x\to\frac{\pi}{2}}(\sec x - \tan x)$.

(a) 0

(b) 1

(c) -1

(d) ∞

Ques. 19: The interval of concave downward is of the function $f(x) = x^2 \ln x$ is

(a) $(-\infty, e^{\frac{1}{2}})$

(b) $(-\infty, e^{-\frac{3}{2}})$

(c) $(-\infty, e^{\frac{3}{2}})$

(d) $(-\infty, e^{-\frac{1}{2}})$

Ques. 20: The critical numbers of the curve $y = x^4 - 4x^3$

(a) 0 and 4

(b) 0 and 2

(c) 0 and 1

(d) 0 and 3