MCCOY COLLEGE OF EDUCATION, NADOWLI.

EBS 301: CALCULUS

QUIZ 1

5TH MARCH 2021 TIME: 2:00PM – 2:30PM

Answer all questions. Circle the correct answer. All rough work MUST be done on the question paper

1. Evaluate: $\lim_{x\to 1}\left(\frac{x-1}{x^2-3x+2}\right)$
   a. $\frac{1}{2}$
   b. -1
   c. 1
   d. $-\frac{1}{2}$
2. Find the gradient function of the curve: $y = (5-x)^{-3}$.
   a. $\frac{3}{(5-x)^4}$
   b. $\frac{-3}{(5-x)^4}$
   c. $\frac{15}{(5-x)^4}$
   d. $\frac{-15}{(5-x)^4}$
3. Find the derivative of $\frac{2x-1}{3x+1}$.
   a. $-\frac{5}{(3x+1)^2}$
   b. $\frac{5}{(3x+1)^2}$
   c. $\frac{12x-1}{(3x+1)^2}$
   d. $\frac{12x+1}{(3x+1)^2}$
4. Differentiate $x^2 + xy - 5 = 0$ with respect to x.
   a. $\frac{2x-y}{x}$
   b. $\frac{-x}{2x+y}$
   c. $\frac{2x+y}{x}$
   d. $\frac{-(2x+y)}{x}$

5. If $f(x) = \frac{5x^3+x^2}{x}, x \neq 0$, find $f'(x)$.
   A. $10x + 1$
   B. $10x + 2$
   C. $x(15x + 1)$
   D. $x(15x+2)$
6. Given that $y = x(2x + 3)(x^2 + x)$, find $\frac{dy}{dx}$.
   A. $8x^3 + 15x^2 + 6x$
   B. $8x^3 - 15x^2 - 6x$
   C. $16x^3 + 15x^2 + 6x$
   D. $16x^3 - 15x^2 - 6x$
7. Evaluate $\lim_{x\to\infty} \frac{3x^3-4x^2+2}{7x^3+3c}$
   A. $-\frac{3}{7}$
   B. $\frac{3}{7}$
   C. $\frac{5}{7}$
   D. $-\frac{5}{7}$
8. If $f(x) = x^3 - 3x^2 + 2x$, find the value of q given that $f''(q) = 24$
   A. 3
   B. 4
   C. 5
   D. 6
9. If the second derivative of a function f gives a linear function, then f is a
   A. Linear function
   B. Quadratic function
   C. Cubic function
   D. Rational function
10. If $f(x) = \begin{cases} 4x - 7, if\ x > 3 \\ x^2 - 3,\ if\ -2 < x < 3 \\ 2x + 3,\ if\ x < -2 \end{cases}$

    Find $\lim_{x\to-4} f(x)$.
    A. -15
    B. -5
    C. 6
    D. 13
11. Evaluate $\lim_{x\to2}(\frac{x^2-3x+2}{x^2-4})$
    A. 0
    B. 1

C. $\frac{1}{4}$

D. $\frac{3}{4}$

12. Find the derivative of $3x^2 + \frac{1}{x^2}$

A. $6x + 2x^2$

B. $6x + \frac{1}{2x}$

C. $6x - \frac{2}{x^3}$

D. $6x - \frac{1}{2x}$

13. Find the least value of the function $f(x) = 3x^2 + 18x + 32$

A. 5

B. 4

C. 3

D. 2

14. Find the coordinates of the point on the curve $y = x^2 + 4x - 2$, where the gradient is zero

A. $(-2, 10)$

B. $(-2, 2)$

C. $(-2, -2)$

D. $(-2, -6)$

15 $f(x) = 3x^2 - 12x + 5$. If $f'(x) = -3$, find the value of x.

A. $\frac{3}{2}$

B. 4

C. $\frac{5}{2}$

D. 3

16. Find, with respect to x, the first derivative of $(2 - 3x)^5$.

A. $-15(2 - 3x)^5$

B. $15(2 - 3x)^4$

C. $-15(2 - 3x)^4$

D. $-x(2 - 3x)$

17. Find the limit of the function $\frac{3h + 2h^2 + 4h^3}{h}$ as h approaches zero.

A. 0

B. 2

C. 3

D. 4