ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

Worksheet-18

SUBJECT – MATHEMATICS

Pre-test

Chapter: Applications of derivatives **Class: XII**

Topic: Maxima & Minima **Date: 03.08.2020**

Choose the correct option (1 X 15= 15)

1. If a differentiable function $f(x)$ attains a local extremum at $x = a$, then—

Ⓐ $f'(a) = 0, f''(a) < 0$ Ⓑ $f'(a) < 0$

Ⓒ $f'(a) = 0, f''(a) \neq 0$ Ⓓ $f'(a) = 0, f''(a) > 0$

2. If a function is not differentiable at $x = c$, then the function—

Ⓐ may attain a local maximum

Ⓑ may attain a local minimum

Ⓒ cannot attain an extremum

Ⓓ may attain both a maximum or a minimum

3. In a given interval a function—

Ⓐ can have two consecutive maxima;

Ⓑ can have two consecutive minima;

Ⓒ possesses maximum and minimum values alternately

Ⓓ cannot have more than two extreme values.

4. The function $f(x) = 4x - x^2 - 3$ has a maximum value at—

Ⓐ $x = 3$ Ⓑ $x = 2$

Ⓒ $x = -2$ Ⓓ none of these

5. The minimum value of the function $y = x^2 - 6x + 11$ is—

Ⓐ 2 Ⓑ -2 Ⓒ 3 Ⓓ -3

6. Let $f(x) = x^3 - 9x^2 + 30x + 5$ be a differentiable function of x; then—

Ⓐ $f(x)$ is minimum at $x = 3$

Ⓑ minimum value of $f(x)$ is 8

Ⓒ minimum value of $f(x)$ is greater than its maximum value

Ⓓ $f(x)$ possesses neither a maximum nor a minimum.

7. If $0 \leqslant x \leqslant 2\pi$, the function $f(x) = \sin x$ is minimum at—

Ⓐ $x = \frac{3\pi}{2}$ Ⓑ $x = \pi$ Ⓒ $x = \frac{3\pi}{4}$ Ⓓ $x = 2\pi$

8. The maximum value of the function $f(x) = 5 - x - x^2$ is—

Ⓐ $\frac{17}{4}$ Ⓑ $\frac{21}{4}$ Ⓒ -1 Ⓓ $\frac{19}{4}$

9. Let $x = c$ be a point in the domain of definition of a differentiable function; then $f(x)$ will have a local maximum at $x = c$ when—

Ⓐ $f'(c) = 0,\ f''(c) \neq 0$ Ⓑ $f'(c) = 0,\ f''(c) > 0$

Ⓒ $f'(c) = 0,\ f''(c) < 0$ Ⓓ $f'(c) = 0,\ f''(c) = 0$

10. The minimum value of the function $f(x) = x^2 - x + 2$ is—

Ⓐ $\frac{1}{2}$ Ⓑ $-\frac{1}{2}$ Ⓒ $-\frac{7}{4}$ Ⓓ $\frac{7}{4}$

11. If $-\pi \leqslant x \leqslant \pi$, then $f(x) = \cos x$ is maximum at—

Ⓐ $x = 0$ Ⓑ $x = \frac{\pi}{2}$ Ⓒ $x = \pi$ Ⓓ $x = -\pi$

12. The critical points of the function $f(x) = \frac{2}{3}x^3 - \frac{3}{2}x^2 - 2x + 5$ are—

Ⓐ $\frac{1}{2}, -2$ Ⓑ $-\frac{1}{2}, 2$ Ⓒ $\frac{1}{2}, 2$ Ⓓ $-\frac{1}{2}, -2$

13. The maximum value of the product of the two numbers if their sum is 12 is –

a. 30 b. 34 c. 36 d. 40

14. The minimum value of $2x^2 - 4x + 10$ is -

a. 7 b. 8 c. 9 d. 10

15. The maximum value of $(1 - x)(2 + 3x)$ is -

a. 7 b. $\frac{12}{25}$ c. 9 d. $\frac{25}{12}$

Prepared by :-

Mr. SUKUMAR MANDAL (SkM).