MCQs – Ch # 2: F.Sc Part 2

CALCULUS AND ANALYTIC GEOMETRY, MATHEMATICS 12

Choose the correct answer.

1. The Concept of area, volume and centriod are related to
(a) Geometry (b) Integral Calculus (c) Differential Calculus (d) Trignometry

2. The rate of change is related to the
(a) Geometry (b) Integral Calculus (c) Differential Calculus (d) Trigonometry

3. The change in the value of the expression x^2+1 depends upon the change in the value of the variable
(a) y (b) x (c) Both a and b (d) None of these

4. Average rate of change of $s(t)$ is defined as:
(a) $\frac{s(t_1)-s(t)}{t_1-t}$ (b) $\frac{s(t_1)+s(t)}{t_1+t}$ (c) $\frac{s(t_1)-s(t)}{t_1}$ (d) $\frac{s(t)}{t}$

5. If $S(t) = t^2+t$, then average rate of change from $t = 3$ to $t = 5$ is
(a) 7.5 (b) 8 (c) 9 (d) 8.5

6. The derivative of a constant function is
(a) 1 (b) constant (c) 0 (d) None of these

7. If $f(x)= x^n$, then $f(x) = nx^{n-1}$ holds
(a) For all Real Nos (b) Only for Integers (c) Only for Rational nos (d) Only for Irrational Nos

8. $\frac{dy}{dx} =$
(a) $\underset{\delta x\to 0}{Lim}\frac{\delta x}{\delta y}$ (b) $\underset{\delta y\to 0}{Lim}\frac{\delta y}{\delta x}$ (c) $\underset{\delta x\to y}{Lim}\frac{\delta y}{\delta x}$ (d) $\underset{\delta x\to 0}{Lim}\frac{\delta y}{\delta x}$

9. By the Chain Rule, $\frac{dy}{dx} =$
(a) $\frac{dy}{dx}.dt$ (b) $\frac{dy}{dx}.\frac{dt}{dt}$ (c) $\frac{dy}{dt}.\frac{dx}{dt}$ (d) $\frac{dy}{dt}.\frac{dt}{dx}$

10. If $y = e^{f(x)}$ then $\frac{dy}{dx} =$
(a) $e^{f(x)}$ (b) $e^{f(x)}f(x)$ (c) $e^{f(x)}f'(x)$ (d) $\frac{e^{f(x)}}{f'(x)}$

11. $\log_b a = 1$ if $a =$
(a) 1 (b) b (c) e (d) 0

12. For $y = x^2 + x$, then $y+\delta y =$
(a) $x^2+x+\delta x$ (b) $(x+\delta x)^2+x+\delta x$ (c) $(x+\delta x)^2+x$ (d) None of the these

13. A series of the form $a_\circ + a_1x + a_2x^2 + \cdots + a_nx^n \ldots$ is called
(a) Power Series (b) Taylor Series (c) Maclaurin Series (d) None of these

14. $x-\frac{x^3}{3}+\frac{x^5}{5}-\frac{x^7}{7}\cdots$, is series expansion of
(a) *Cosx* (b) *Sinx* (c) *Tanx* (d) 1/ *Cosx*

15. If $\delta x \neq 0$ then $\underset{\delta x \to 0^-}{Lim} \frac{|\delta x|}{\delta x} =$_____

(a) 1 (b) 0 (c) -1 (d) ∞

16. A point at which 1st derivative is zero i.e $f'(x) = 0$ is called

(a) point of inflection (b) stationary point (c) stagnation point (d) extreme point

17. $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots$, is series expansion of

(a) e (b) e^x (c) e^{2x} (d) e^{-1}

18. The derivative of $f(x) = |x|$ does not exits at

(a) $x = 0$ (b) $x = 1$ (c) **R** (d) None of these

19. If $f(x)$ is defined on [a, b], and $f(x_1) = f(x_2)$, $\forall x_1, x_2 \in [a, b]$, then $f(x)$ is called _____ function.

(a) increasing (b) decreasing (c) constant (d) None of these

20. For relative minima at x = c, $f'(c) = 0$, and

(a) $f''(c) < 0$ (b) $f''(c) > 0$ (c) $f'(c) < 0$ (d) $f'(c) > 0$

21. If $x = at^2$, $y = 2at$, then $\frac{dy}{dx} =$

(a) t (b) $\frac{1}{t}$ (c) a (d) 1

22. $\frac{e^x + e^{-x}}{2} = \frac{d}{dx}$ _____

(a) Sinhx (b) Coshx (c) tanhx (d) None of these

23. For relative maxima at x = c, $f'(c) = 0$, and

(a) $f''(c) < 0$ (b) $f''(c) > 0$ (c) $f'(c) < 0$ (d) $f'(c) > 0$

24. If $f(x) = x^4 + x^3 + x^2 + 1$, then $f^{iv}(x) =$

(a) 0 (b) 1 (c) (d) 4 !

25. A point at which 2nd derivative is zero i.e $f''(x) = 0$ is called

(a) Point of inflection (b) stationary point (c) stagnation point (d) extreme point

26. $f(x) = f(0) + xf(0) + \frac{x^2}{2!} f(0) + \cdots + \frac{x^n}{n!} f(0) + \cdots$ is called

(a) Taylor Series (b) Power Series (c) Maclaurin Series (d) None of these

27. If $f(x_1) < f(x_2)$ whenever $x_1 < x_2$ on the interval (a, b), then $f(x)$ is called_____

(a) Increasing (b) decreasing (c) constant (d) None of these

28. If $f(x)$ be differentiable on (a,b), then $f(x)$ is decreasing on (a,b) $\forall x \in (a,b)$ if

(a) $f'(x) = 0$ (b) $f'(x) > 0$ (c) $f'(x) < 0$ (d) None of these

29. $\frac{d}{dx}(Cot^{-1}x) =$_____

(a) $\frac{-1}{1-x^2}$ (b) $\frac{1}{1+x^2}$ (c) $\frac{x}{1+x^2}$ (d) $\frac{-1}{1+x^2}$

30. $\frac{d}{dx}\left(\log_{10}(ax^2+bx+c)\right)=$ _____

(a) $\log_{10}(ax^2+bx+c).(2ax+b)$ (b) $\frac{\log_{10}(ax^2+bx+c).}{(2ax+b)}$ (c) $\frac{(2ax+b)}{(ax^2+bx+c).\ln 10}$ (d) $\frac{(2ax+b).\ln 10}{(ax^2+bx+c)}$

31. $1-1+\frac{1}{2!}-\frac{1}{3!}+\cdots$, is series expansion of _____

(a) e (b) $\text{Sin}60^{\circ}$ (c) ln10 (d) e^{-1}

32. If $f(x)=x^6$, then $f^{(vii)}(x)=$ _____

(a) 0 (b) 6.5.4.3.2.1 (c) 6.5.4.3.2.1x (d) None of these

33. If $f(x)$ be differentiable on (a,b), then $f(x)$ is increasing on (a,b) $\forall x \in (a,b)$ if

(a) $f'(x)=0$ (b) $f'(x)>0$ (c) $f'(x)<0$ (d) None of these

34. If $y=a^x$, then $f'''(x)=$

(a) $(a^x)^3$ (b) $(\ln a)^3$ (c) $a^x(\ln a)^3$ (d) $a^x(\ln a)^{-3}$

35. If $x\neq 0$ then $\underset{x\to 0^+}{Lim}\frac{|x|}{x}=$_____

(a) 1 (b) 0 (c) -1 (d) ∞

36. If $f(x_1)>f(x_2)$ whenever $x_1<x_2$ on the interval (a, b), then $f(x)$ is called _____

(a) increasing (b) decreasing (c) constant (d) None of these

37. The stationary point of the function $f(x)=5x^2-6x+2$ is

(a) 5/3 (b) 3/5 (c) 0 (d) 1

38. $f(x)=\sin x$ is an increasing function on the interval _____

(a) $\left[\frac{-\pi}{2},\frac{\pi}{2}\right]$ (b) $[0,\pi]$ (c) $\left[\frac{\pi}{2},\pi\right]$ (d) $\left[0,\frac{\pi}{2}\right]$

39. $e^{x\ln a}=$

(a) a^{-x} (b) a^x (c) x^a (d) x^{-a}

40. $\frac{d}{dx}\left(x+\frac{1}{x}\right)=$

(a) $1+\frac{1}{x}$ (b) $x+\frac{1}{x^2}$ (c) $x-\frac{1}{x^2}$ (d) $1-\frac{1}{x^2}$

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