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MCQs – Ch # 1: F.Sc Part 2

CALCULUS AND ANALYTIC GEOMETRY, MATHEMATICS 12
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Choose the correct answer.

1. The set of first element of all ordered pairs of a binary relation is called its
   (a) Range (b) Domain (c) Co-domain (d) None of these
2. If every member of a set A is also member of set B, then
   (a) A is subset of B (b) A is super set of B (c) B is subset of A (d) None of these
3. A quantity which does not remain fixed is called a
   (a) Variable (b) Constant (c) Parameter (d) Both b and c
4. If f is a function $f: X \to Y$, then Y is called
   (a) Domain (b) Co-domain (c) Range (d) None of these
5. If y is a function of x, then y is called
   (a) independent variable (b) Dependent Variable (c) Parameter (d) Constant
6. If A and B are non-empty sets, then A × B is
   (a) $\{(x,y)/x \in A \wedge y \in B\}$ (b) $\{(x,y)/x \in A \vee y \in B\}$ (c) $\{(x,y)/x \in B \wedge y \in A\}$ (d) $\{(x,y)/x \in B \vee y \in A\}$
7. Any subset of $A \times B$ is called a
   (a) binary relation (b) binary operation (c) function (d) Cartesian Product
8. x is function of y is written as
   (a) $y = f(x)$ (b) $x = f(y)$ (c) $f(x, y) = 0$ (d) $x = y$
9. If a function $f: X \to Y$ is such that $\forall x_1, x_2 \in X, x_1 \neq x_2 \Leftrightarrow f(x_1) \neq f(x_2)$, then f is called
   (a) Onto (b) (1-1) (c) Into (d) Both a and b
10. For a function $f: X \to Y$, if Range = Y then f is called
    (a) Onto (b) (1-1) (c) Into (d) Both b and c
11. Onto function is also known as
    (a) Surjective (b) Injective (c) Bijective (d) None of these
12. If a degree of polynomial function is 2, then function is
    (a) Linear (b) Quadratic (c) Cubic (d) None of these
13. A function of the form $\frac{P(x)}{Q(x)}, Q(x) \neq 0,$ where $P(x)$ and $Q(x)$ are polynomials is called a _____ function.
    (a)Exponential (b) Trigonometric (c) Transcendental (d) Rational
14. The function $y = \log_e x$ is called _____ Logarithmic
    (a) Common (b) Natural (c) General (d) None of these
15. The equation of the form $x = f(t), y = g(t)$ where t is parameter are called
    (a) Implicit equation (b) explicit equation (c) Parametric equation (d)
16. If $f(x) = Sinx + Cosx$ then f is _____ function
    (a) Odd (b) Even (c) Implicit (d) None of these
17. Domain of $f(x) = 2 + \sqrt{x-1}, \forall x \in \mathbf{R}$ is
    (a) $[1,\infty)$ (b) $(1, \infty)$ (c) $[2, \infty)$ (d) $\mathbf{R}$
18. If $f(x)=2x+3$, $g(x)=x^2$, then $g \circ f(x)$ is
    (a) x^2 (b) $2x^2+3$ (c) $(2x+3)^2$ (d) 2x+3
19. $\lim\limits_{x \to c}[f(x)]^n =$
    (a) $\lim\limits_{x \to c} f(x)$ (b) $\lim\limits_{x \to c} f(x^n) =$ (c) $[\lim\limits_{x \to c} f(x)]^n$ (d) $n.\lim\limits_{x \to c} f(x)$

20. $\lim_{x\to\pm\infty}(\frac{a}{x}) =$

(a) $\pm\infty$ (b) a (c) $\pm a$ (d) 0

21. If $\lim_{x\to c} f(x) = f(c)$, then f is

(a) Continuous at $x=c$ (b) Differentiable at $x=c$ (c) Piecewise Continuous (d) Discontinuous at $x=c$

22. $y = \log_e x$ is undefined when

(a) $x=10$ (b) $x = 0$ (c) $x < 0$ (d) Both b and c

23. The Graph of the equation represents $x^2+y^2=a^2$

(a) a Parabola (b) an Ellipse (c) a circle (d) a hyperbola

24. The function $f(x) = \frac{x^2-1}{x-1}$, is undefined at

(a) x = 0 (b) x =1 (c) x = -1 (d) x = ∞

25. Which one of them is not a polynomial function

(a) $x^2 + x + 1$ (b) $\frac{1}{2}x^2 + \frac{3}{5}x + 1$ (c) $x^2 + x + 1$ (d) $x^2 + \frac{1}{x^2}$

26. For $y = Cosx$, Range =_____

(a) $-1 \le y \le 1$ (b) $-1 < y < 1$ (c) $-\infty < y < \infty$ (d) $y \le -1,\ y \ge 1$

27. Which one is Hyperbolic Cosine Function

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

28. $\lim_{x\to h}(1+2h)^{1/h}$ = _____

(a) e^2 (b) e (c) 0 (d) 1

29. $|x-1| = 1-x$, then

(a) $x > 1$ (b) $x < 1$ (c) $x = 1$ (d) $x = 0$

30. A function of the form $f(x, y) = 0$ is called _____ Function

(a) Implicit (b) Explicit (c) Even (d) Parametric

31. If $f(x) = |x-3|$, then Range f =_____

(a) [0,∞) (b) (-∞,∞) (c) [3, ∞) (d) [-3,3]

32. If f(x) = 2x+1, then $f^{-1}(x)$ =_____

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

33. If $g(x) = \frac{1}{x^2}$, then $g \circ g(x) =$

(a) $\frac{1}{x^2}$ (b) x^4 (c) $\frac{1}{x^4}$ (d) x^2

34. If $y = a^x$, a > 0, when x increases then y = _____

(a) decreases (b) does not change (c) increases (d) approaches to zero

35. $\lim_{\theta\to 0}\frac{\theta}{Tan\theta}$ = _____

(a) 0 (b) ∞ (c) 1 (d) None of the These

36. $\lim_{x\to a}\frac{x^n - a^n}{x-a}$ = _____

(a) na^{n-1} (b) a (c) ∞ (d) na

37. *If f: X* à *Y* ,then f^{-1} exist, iff f is _____
(a) Injective (b) Surjective (c) Bijective (d) Real

38. If $f(x) = x^3 - 2x^2 + 4x - 1$, then *f(-2)* = _____
(a) 25 (b) -25 (c) -1 (d) 0

39. If $f(x) = \sqrt{x^2 - 9}$, then Domain of f = _____
(a) $(-\infty,-3) \cup (3,\infty)$ (b) $(-\infty,-3] \cup [3,\infty)$ (c) $(-\infty,\infty)$ (d) [-3,3]

40. $\underset{\theta \to 0}{Lim} \frac{Sin7\theta}{\theta}$ = _____
(a) 0 (b) 1 / 7 (c) 7 (d) 1

41. The parametric equations $x = at^2$, *and* $y = 2at$ represents the equation of _____
(a) Circle (b) Ellipse (c) Hyperbola (d) Parabola

42. $\frac{xy^2 - y + 9}{xy} - 1 =$ is an example of an _____ Function
a) Implicit (b) Explicit (c) Even (d) Parametric

43. Domain of *Tanx* is Dom = $\{x : x \in \mathbf{R} \wedge$ _____, $n \in Z\}$
(a) $x = (2n+1)\frac{\pi}{2}$ (b) $x \neq \frac{n\pi}{2}$ (c) $x \neq (2n+1)\frac{\pi}{2}$ (d) $x \neq (2n+1)\pi$

44. If $f(x) = \sqrt{x+2}$, then Domain of f^{-1} is
(a) $(0,\infty)$ (b) $[2, \infty)$ (c) $(-\infty,\infty)$ (d) $[0, \infty)$

45. If $f(x) = \sqrt{x+2}$, then Range of f^{-1} is
(a) $[-2, \infty)$ (b) $(-2, \infty)$ (c) $[-2, 2]$ (d) $(-\infty, \infty)$

46. $Coth^2x - 1$ =
(a) $Cosech^2x$ (b) $Sinh^2x$ (c) $Tanh^2x$ (d) None of these

47. $\underset{x \to \infty}{Lim}(e^x)$ = _____ and $\underset{x \to -\infty}{Lim}(e^x)$ = _____
(a) ∞ and 0 (b) 0 and ∞ (c) ∞ and $-\infty$ (d) 0 and 0

48. The term function was introduced by a German mathematician whose name was
(a) Cantor (b) Leibnez (c) Euler (d) Raymond

49. The parametric equation $x = r\cos\theta, y = r\sin\theta$ represent a
(a) a Parabola (b) an Ellipse (c) a circle (d) a hyperbola

50. If $f(-x) = -f(x)$ then f is called (a) even (b) odd (c) implicit (d) explicit