

ECAT Pre Engineering Entry Test

Sr	Questions	Answers Choice
1	$\forall x \in (a,b), f(x)$ is increasing if	A. $f'(x) > 0$ B. $f'(x) < 0$ C. $f''(x) > 0$ D. $f''(x) = 0$
2	$(f \circ g)'(x) = f'(g(x))g'(x)$ is derivative by	A. Chain rule B. Reciprocal rule C. Power rule D. Product rule
3	The range of function $f(x) = -x^2 + 2x - 1$ is	A. R B. $(-\infty, 0]$ C. $(-\infty, 1]$ D. $[0, \infty)$
4	Inverse of the function $y = 10^x$ is	A. $y = \log x$ B. $y = \ln x$ C. $x = 10y$ D. $x = 10^y$
5	If $f(a) = b^2$ and $g(c) = d$ where $c = b^2$ then $(g \circ f)(a)$ is	A. a B. c C. b D. d
6	$x = r^2, y = 1$ are the parametric equation of	A. Circle B. Hyperbola C. Ellipse D. Parabola
7	The set of points $\{(x,y) y = f(x), \forall x \in \mathbb{R}\}$ is called	A. Relation B. Graph of f C. Function D. All are correct
8	If $f(x) = 2x+1$ then $f \circ f(x) =$ _____;	A. $4x+3$ B. $2x+3$ C. $4x+1$ D. None of these
9	The function $f(x) = x $ is a/an _____ function	A. Even B. Odd C. Both even as well as odd D. Neither even nor odd
10	Domain of $\cosh x$ is	A. R B. $\mathbb{R} - \{0\}$ C. $[1, \infty)$ D. $[0, \infty)$
11	The function discontinuous at $x = 0$ is (I) $\tan x$ (II) $\cot x$ (III) $\sec x$ (iv) $\operatorname{cosec} x$	A. I & III B. I & IV C. II & IV D. II & III
12	The curve $f(x,y) = 0$ has a central symmetry if	A. $f(-x,-y) = f(x,y)$ B. $f(x,-y) = f(x,y)$ C. $f(-x,y) = f(x,y)$ D. $f(-x,-y) \neq f(x,y)$
13	The only function which is both even and odd is	A. $f(x) = a$ B. $f(x) = x$ C. $f(x) = 0$ D. Both A & B
14	The range of the function $f: X \rightarrow Y$ is defined by	A. $\{x y = f(x) \forall x \in X \wedge y \in Y\}$ B. $\{(x,y) y = f(x) \forall x \in X\}$ C. $\{y y = f(x) \forall x \in X \wedge y \in Y\}$ D. Y
15	An even function is symmetric about the line	A. $y = x$ B. $x = 0$ C. $y = -x$ D. $y = 0$

16	If a tangent line touches the function $y = f(x)$ in more than one point then $y = f(x)$ is	A. Periodic B. Surjective C. Bijective D. Injective
17	Composition of functions is	A. Non-commutative ($fg \neq gf$) B. non-associative [$8(fh) \neq (8f)h$] C. Commutative ($fg = gf$) D. $f \circ f^{-1} \neq 1$
18	$x = \sec\theta, y = \tan\theta$ are the parametric equations of	A. Circle B. Hyperbola C. Ellipse D. parabola
19	The range of $y = x^2 + 1$ is the set of non-negative real numbers except	A. $0 \leq y \leq 1$ B. $0 < y < 1$ C. $0 \leq y \leq 1$ D. $0 < y \leq 1$
20	The function $f : x \rightarrow y$ defined as $f(x) = \alpha \forall x \in X, \alpha \in y$ is called	A. Constant function B. Polynomial function C. Identity function D. Linear function
21	$f(x) = x $ is a/an	A. Injective function B. Bijective function C. Surjective function D. Implicit function
22	Point (2,0) lies on trigonometric function $f(x) = \underline{\hspace{1cm}}$;	A. $\sin x$ B. $\cos x$ C. $\tan x$ D. $\sec x$
23	The domain of $y = \cos^{-1} x$ is	A. $-\infty < x < \infty$ B. $-1 \leq x \leq 1$ C. $x \leq -1$ or $x \geq 1$ D. None of these
24	For any equilateral $\triangle ABC$ $r : R :: r_1 : r_2 :: r_3 =$	A. 1:2:3:4:5 B. 1:2:3:3:3 C. 1:2:4:4:4 D. 2:1:2:2:2
25	Area of inscribed circle is	A. πR^2 B. πr^2 C. πr^2 D. πr^2
26	In any triangle ABC, with usual notation $a \sin \beta = \underline{\hspace{1cm}}$;	A. $b \sin \alpha$ B. $b \sin \beta$ C. $a \sin \alpha$ D. None of these
27	The law of cosines reduces to $a^2 + c^2 = b^2$ for	A. $\alpha = 90^\circ$ B. $\beta = 90^\circ$ C. $\gamma = 90^\circ$ D. $\alpha + \beta + \gamma = 180^\circ$
28	e-radii are denoted by	A. r B. r^2 C. r^3 D. All of these
29	In-radius is denoted by	A. r B. r C. r^2 D. R
30	A circle which touches one side of a triangle externally and the other two sides produced is called	A. In-circle B. Circumcircle C. e-circle D. Point circle