

MATHEMATICS (ASSIGNMENT-1)

TOPIC - FUNCTION

- Q.1 The period of $\sin^2 x$ is-
 (A) $\pi/2$ (B) π (C) $3\pi/2$ (D) 2π
- Q.2 The function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \sin x$ is-
 (A) into (B) onto (C) one-one (D) many-one
- Q.3 The range of the function $f(x) = \frac{2+x}{2-x}, x \neq 2$ is -
 (A) \mathbb{R} (B) $\mathbb{R} - \{-1\}$ (C) $\mathbb{R} - \{1\}$ (D) $\mathbb{R} - \{2\}$
- Q.4 The function $f(x) = \log(x + \sqrt{x^2 + 1})$, is-
 (A) neither an even nor an odd function (B) an even function
 (C) an odd function (D) a periodic function
- Q.5 Domain of definition of the function $f(x) = \frac{3}{4-x^2} + \log_{10}(x^3 - x)$, is-
 (A) $(-1, 0) \cup (1, 2) \cup (2, \infty)$ (B) $(1, 2)$
 (C) $(-1, 0) \cup (1, 2)$ (D) $(1, 2) \cup (2, \infty)$
- Q.6 A function f from the set of natural numbers to integers defined by
- $$f(n) = \begin{cases} \frac{n-1}{2}, & \text{when } n \text{ is odd} \\ -\frac{n}{2}, & \text{when } n \text{ is even} \end{cases} \text{ is}$$
- (A) neither one-one nor onto (B) one-one but not onto
 (C) onto but not one-one (D) one-one and onto both
- Q.7 The range of the function $f(x) = {}^{7-x}P_{x-3}$ is-
 (A) $\{1, 2, 3\}$ (B) $\{1, 2, 3, 4, 5, 6\}$ (C) $\{1, 2, 3, 4\}$ (D) $\{1, 2, 3, 4, 5\}$
- Q.8 If $f: \mathbb{R} \rightarrow \mathbb{S}$, defined by $f(x) = \sin x - \sqrt{3} \cos x + 1$, is onto, then the interval of \mathbb{S} is-
 (A) $[0, 3]$ (B) $[-1, 1]$ (C) $[0, 1]$ (D) $[-1, 3]$
- Q.9 The graph of the function $y = f(x)$ is symmetrical about the line $x = 2$, then-
 (A) $f(x+2) = f(x-2)$ (B) $f(2+x) = f(2-x)$ (C) $f(x) = f(-x)$ (D) $f(x) = -f(-x)$
- Q.10 The domain of the function $f(x) = \frac{\sin^{-1}(x-3)}{\sqrt{9-x^2}}$ is-
 (A) $[2, 3]$ (B) $[2, 3)$ (C) $[1, 2]$ (D) $[1, 2)$

- Q.11 Let $f: (-1, 1) \rightarrow B$, be a function defined by $f(x) = \tan^{-1} \frac{2x}{1-x^2}$, then f is both one-one and onto when B is the interval -
- (A) $\left(0, \frac{\pi}{2}\right)$ (B) $\left[0, \frac{\pi}{2}\right)$ (C) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (D) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$
- Q.12 A real valued function $f(x)$ satisfies the functional equation $f(x-y) = f(x)f(y) - f(a-x)f(a+y)$ where a is a given constant and $f(0) = 1$, then $f(2a-x)$ is equal to -
- (A) $-f(x)$ (B) $f(x)$ (C) $f(a) + f(a-x)$ (D) $f(-x)$
- Q.13 The largest interval lying in $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ for which the function is defined, is-
- (A) $[0, \pi]$ (B) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ (C) $\left[-\frac{\pi}{4}, \frac{\pi}{2}\right)$ (D) $\left[0, \frac{\pi}{2}\right)$
- Q.14 Let $f: N \rightarrow Y$ be a function defined as $f(x) = 4x + 3$ where $Y = \{y \in N : y = 4x + 3 \text{ for some } x \in N\}$. Then, the inverse of $f(x)$, is
- (A) $g(y) = 4 + \frac{y+3}{4}$ (B) $g(y) = \frac{y+3}{4}$ (C) $g(y) = \frac{y-3}{4}$ (D) $g(y) = \frac{3y+4}{3}$
- Q.15 For real x , let $f(x) = x^3 + 5x + 1$, then -
- (A) f is one – one but not onto R (B) f is onto R but not one – one
(C) f is one – one and onto R (D) f is neither one – one nor onto R
- Q.16 Let $f(x) = (x + 1)^2 - 1, x \geq -1$
Statement – 1 : The set $\{x : f(x) = f^{-1}(x)\} = \{0, -1\}$.
Statement – 2 : f is a bijection.
- (A) Statement -1 is true, Statement -2 is true; Statement -2 is a correct explanation for Statement -1
(B) Statement -1 is true, Statement -2 is true; Statement -2 is not a correct explanation for Statement -1
(C) Statement -1 is true, Statement -2 is false.
(D) Statement -1 is false, Statement -2 is true.

ANSWER- KEY

Q.1	B	Q.2	A	Q.3	B	Q.4	C	Q.5	A
Q.6	D	Q.7	A	Q.8	D	Q.9	B	Q.10	B
Q.11	D	Q.12	A	Q.13	D	Q.14	C	Q.15	C
Q.16	C								