

CLASS: XIth DATE:

SUBJECT: MATHS

 $\sin\frac{\pi x}{2} + 2\cos\frac{\pi x}{3} - \tan\frac{\pi x}{4}$ is

DPP NO.:3

Topic:-Relations and functions

The function f(x) =periodic with period

a) 6

b) 3

c) 4

d) 12

2. The equivalent definition of the function

 $f(x) = \lim_{n \to \infty} \frac{x^n - x^{-n}}{x^n + x^{-n}}, x > 0, \text{ is}$ a) $f(x) = \begin{cases} -1, & 0 < x \le 1 \\ 1, & x > 1 \end{cases}$ b) $f(x) = \begin{cases} -1, & 0 < x < 1 \\ 1, & x \ge 1 \end{cases}$ c) $f(x) = \begin{cases} -1, & 0 < x < 1 \\ 0, & x = 1 \\ 1, & x > 1 \end{cases}$ d) None of these

- Let $R = \{(1,3), (4,2), (2,4), (2,3), (3,1)\}$ be a relation on the set $A = \{1,2,3,4\}$. The relation R is a) A function b) Transitive c) Not symmetric d) Reflexive
- The domain of the function

 $f(x) = {}^{16-x}C_{2x-1} + {}^{20-3x}P_{4x-5}$, where the symbols have their usual meanings, is the set

c) $\{1, 2, 3, 4\}$

d) {1, 2, 3, 4, 5}

5. If $f: R \to C$ is defined by $f(x) = e^{2ix}$ for $x \in R$, then f is (where C denotes the set of all complex numbers)

a) One-one

b) Onto

c) One-one and onto

- d) Neither one-one nor onto
- 6. The domain of the function

 $f(x) = \log_{10}(\sqrt{x-4} + \sqrt{6-x})$ is a) [4, 6]

b) $(-\infty, 6)$

c) [2, 3)

d) None of these

7. If $f(x) = \sin^2 x$, $g(x) = \sqrt{x}$ and $h(x) = \cos^{-1} x$, $0 \le x \le 1$, then

a) hogof = fogoh

b) gofoh = fohog c) fohog = hogof

d) None of these

8. If $f(x) = \frac{2^x + 2^{-x}}{2}$, then f(x + y)f(x - y) is equal to a) $\frac{1}{2} \{ f(2x) + f(2y) \}$ b) $\frac{1}{2} \{ f(2x) - f(2y) \}$ c) $\frac{1}{4} \{ f(2x) + f(2y) \}$ d) $\frac{1}{4} \{ f(2x) - f(2y) \}$

The relation R defined on the set of natural numbers as $\{(a, b): a \text{ differs from } b \text{ by } 3\}$ is given by

a) $\{(1, 4), (2, 5), (3, 6), ...\}$

b) $\{(4, 1), (5, 2), (6, 3), ...\}$

c) $\{(1,3), (2,6), (3,9), ...\}$

d) None of the above

- 10. The domain of the function $f(x) = \sin^{-1}(\log_3(x/3))$ is
 - a) [1, 9]
- b) [-1, 9]
- c) [-9, 1]
- d) [-9, -1]
- 11. The range of the function $f(x) = \sin \left\{ \log_{10} \left(\frac{\sqrt{4-x^2}}{1-x} \right) \right\}$, is
 - a) [0, 1]
- b) (-1,0)
- d) (-1,1)

- 12. Let $f(x) = \frac{ax+b}{cx+d}$. Then, $f \circ f(x) = x$ provided that
 - a) d = -a
- b) d = a
- c) a = b = c = d = 1 d) a = b = 1
- 13. Let *C* denote the set of all complex numbers. The function $f: C \to C$ defined by $f(x) = \frac{ax+b}{cx+d}$ for $x \in C$, where $bd \neq 0$ reduces to a constant function if:
 - a) a = c
- b) b = d
- c) ad = bc
- d) ab = cd
- 14. If $\sin \lambda x + \cos \lambda x$ and $|\sin x| + |\cos x|$ are periodic function with the same period, then $\lambda =$

b) 1

c) 2

- 15. The domain of definition of the real function $f(x) = \sqrt{\log_{12} x^2}$ of the real variable x, is
- b) $|x| \ge 1$
- c) $|x| \ge 4$
- 16. If f(x) is an even function and f'(x) exists, then f'(e) + f'(-e) is

- b) = 0
- $c) \geq 0$
- d) < 0

- 17. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then $f\left(\frac{2x}{1+x^2}\right)$ is equal to
 - a) $\{f(x)\}^2$
- c) 2f(x)
- d) 3f(x)
- 18. If the function $f: R \to R$ is defined by $f(x) = \cos^2 x + \sin^4 x$ then f(R) =
 - a) [3/4,1)
- b) (3/4,1]
- c) [3/4,1]
- d)(3/4,1)

- 19. The domain of $\sin^{-1} \left[\log_2 \left(\frac{x}{12} \right) \right]$ is
 - a) [2, 12]
- b) [-1, 1]
- c) $\left[\frac{1}{3}, 24\right]$
- d) [6, 24]
- 20. The largest interval lying in $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ for which the function $f(x) = 4^{-x^2} + \cos^{-1}\left(\frac{x}{2} 1\right) + \log(\cos x)$ is defined, is
 - a) $[0, \pi]$