Exam Code

Class 11 Relations and Functions Test 4

Test Booklet Code

1. If $f(x)+2f\left(\frac{1}{x}\right)=3x, x\neq 0$ and $S=\{x\in R: f(x)=f(-x)\}$ then

(a) $n(S)=2$
(b) $n(S)>2$
(c) $n(S)=1$
(d) $S=\phi$

2. Range of the function $f: W\rightarrow W f(x)=x-5\left[\frac{x}{5}\right]$, where $[x]$ is greater integer function, is

(a) $\mathbf{W}$
(b) $\mathbf{N}$
(c) $\{1,2,3,4,5\}$
(d) $\{0,1,2,3,4\}$

3. If $f(x)=\log\left(\frac{1-x}{1+x}\right), |x|<1$ then $f\left(\frac{2x}{1+x^2}\right)$ is equal to

(a) $(f(x))^2$
(b) $2f(x)$
(c) $-2f(x)$
(d) $2f\left(x^2\right)$

4. For $x\in R-\{-1,1\}$, range of the function $f(x)=\frac{x^2}{1-x^2}$ is

(a) $R-\{-1\}$
(b) $R-(-1,0)$
(c) $[0,\infty)$
(d) $R-[-1,0)$

5. Domain of the function $f(x)=\frac{1}{4-x^2}+\log_{10}\left(x^3-x\right)$ is

(a) $(-1,0)\cup(1,2)\cup(2,\infty)$
(b) $(1,2)\cup(2,\infty)$
(c) $(-1,0)\cup(1,2)\cup(3,\infty)$
(d) $(-2,-1)\cup(-1,0)\cup(2,\infty)$

6. For $x\varepsilon R, [x]$ is greatest integer function then $\left[\frac{-1}{3}\right]+\left[\frac{-1}{3}-\frac{1}{100}\right]+\left[-\frac{1}{3}-\frac{2}{100}\right]+\cdots+\left[-\frac{1}{3}-\frac{99}{100}\right]$ is equal to

(a) -135
(b) -131
(c) -153
(d) -133

7. Range of the function $f: N\rightarrow N, f(n)=\begin{cases}\frac{n+1}{2} \text{ when } n \text{ is odd}\\ \frac{n}{2} \text{ when } n \text{ is even}\end{cases}$

(a) $\mathbf{W}$
(b) $\mathbf{N}$
(c) $\mathbf{R_0}$
(d) $\mathbf{Q}$

8. Range of the function $f(x)=\frac{x}{1+x^2}$ is

(a) $R-[-1,1]$
(b) $(-1,1)-\{0\}$
(c) $R-\left[\frac{-1}{2},\frac{1}{2}\right]$
(d) $\left[\frac{-1}{2},\frac{1}{2}\right]$

9. Range of the function \[f: R ^ { + } \rightarrow R , f (x) = \left| 1 - \frac { 1 } { x } \right| \text { is } \]

(a) $(-\infty,-1)$
(b) $(-\infty,1)$
(c) $(1,\infty)$
(d) $(0,\infty)$

10. $f(x)=a^x$ is written as $f(x)=f_1(x)+f_2(x)$ where $f_1(x)$ is even function $\& f_2(x)$ is odd function then $f_1(0)$ is equal to

(a) 0
(b) 1
(c) -1
(d) 2

11. Domain of the function $f(x)=\frac{1}{\sqrt{|x|-x}}$ is

(a) $\mathbf{R}$
(b) $\mathbf{R_0}$
(c) $\mathbf{R^+}$
(d) $\mathbf{R^-}$

12. Which of these relations is not a function.

(a) $R=\left\{(x,y):y=\frac{1}{x},x\in R_0\right\}$
(b) $R=\{(x,y):x=|y|,x,y\in R\}$
(c) $R=\left\{(x,y):|x+y|=10,x,y\in R^+\right\}$
(d) $R=\left\{(x,y):x^2=y^2,x,y<0\right\}$

13. The domain of the function $f(x)=\frac{1}{\sqrt{x-[x]}}$ is

(a) $\mathbf{R^+}$
(b) $\mathbf{R-I}$
(c) $\mathbf{R_0}$
(d) $\mathbf{R_0-I}$

14. Find the domain of definition of $f(x)=\frac{\log_2(x+3)}{x^2+3x+2}$

(a) $(-3,\infty)$
(b) $\{-1,-2\}$
(c) $(-3,\infty)-\{-1,-2\}$
(d) $(-\infty,\infty)$

15. The domain of definition of the function $y(x)$ given by $2^x+2^y=2$ is

(a) $(0,1]$
(b) $[0,1]$
(c) $(-\infty,0]$
(d) $(-\infty,1)$

16. The domain of the function $f(x)=\log_{3+x}\left(x^2-1\right)$ is

(a) $(-3,-1)\cup(1,\infty)$
(b) $[-3,-1)\cup[1,\infty)$
(c) $(-3,-2)\cup(-2,-1)\cup(1,\infty)$
(d) $[-3,-2)\cup(-2,-1)\cup[1,\infty]$

17. Range of the function {tex} f (x) = \frac { x ^ { 2 } + x + 2 } { x ^ { 2 } + x + 1 } (a) x \in R {/tex} is
(b) $(1,\infty)$
(c) $(1,11/7)$
(d) $(1,7/3]$

18. Domain of $\mathbf{f(x)=\sqrt{2\{x\}^2-3\{x\}+1}}$ where $\mathbf{\{.\}}$ denotes the fractional part, in $\mathbf{[-1,1]}$, is

(a) $[-1,1]\sim\left(\frac{1}{2},1\right)$
(b) $\left[-1,-\frac{1}{2}\right]\cup\left[0,\frac{1}{2}\right]\cup\{1\}$
(c) $\left[-1,\frac{1}{2}\right]$
(d) $\left[-\frac{1}{2},1\right]$

19. If $\mathbf{f(x)=maximum\left\{x^3,x^2,\frac{1}{64}\right\}\forall x\in[0,\infty)}$, then

(a) $f(x)=\begin{cases}x^2, & 0\le x\le 1\\ x^3, & x>1\end{cases}$
(b) $f(x)=\begin{cases}\frac{1}{64}, & 0\le x\le\frac{1}{4}\\ x^2, & \frac{1}{4}<x\le 1\\ x^3 & x>1\end{cases}$
(c) $f(x)=\begin{cases}\frac{1}{64}, & 0\le x\le\frac{1}{8}\\ x^2, & \frac{1}{8}<x\le 1\\ x^3, & x>1\end{cases}$
(d) $f(x)=\begin{cases}\frac{1}{64}, & 0\le x\le\frac{1}{8}\\ x^3, & x>1/x\end{cases}$

20. If x satisfies $|x-1|+|x-2|+|x-3|\ge 6$, then

(a) $0\le x\le 4$
(b) $x\le -2$ or $x\ge 4$
(c) $x\le 0$ or $x\ge 4$
(d) None of these

21. The minimum value of $f(x)=|x-1|+|x-2|+|x-3|$ is equal to.

(a) 1
(b) 2
(c) 3
(d) Zero

22. $f : R \to R$, where $f(x) = \frac{x^2 + ax + 1}{x^2 + x + 1}$. Complete set of values of 'a' such that range of $f(x)$ is R

(a) $(-\infty, \infty)$
(b) $(-\infty, 0)$
(c) $(0, \infty)$
(d) None

23. If f is a function such that $f(0) = 2, f(1) = 3$ and $f(x+2) = 2f(x) - f(x+1)$ for every real x then $f(5)$ is

(a) 7
(b) 13
(c) 1
(d) 5

24. $|x-3| + |x-1| \geq 3$, set of values of x satisfying the equation is

(a) $[4, \infty]$
(b) $(-\infty, 0]$
(c) $\left(-\infty, \frac{1}{2}\right] \cup \left[\frac{7}{2}, \infty\right)$
(d) $\left[\frac{7}{2}, \infty\right)$

25. Period of the function $|\sin 2x| + |\cos 2x|$ is

(a) $\frac{\pi}{2}$
(b) π
(c) 2π
(d) $\frac{\pi}{4}$

26. Period of $f(x) = x - [x + a] - b$, where $a, b \in R$ and $[.]$ denotes the greatest integer function, is

(a) a
(b) b
(c) $|a - b|$
(d) 1

27. Domain of the function $f(x) = \sqrt{\frac{1}{4} - \sin^2 x}, x \epsilon [0, \pi]$, is

(a) $\left[\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right]$
(b) $\left[\frac{\pi}{4}, \frac{3\pi}{4}\right]$
(c) $\left[0, \frac{\pi}{4}\right] \cup \left[\frac{3\pi}{4}, \pi\right]$
(d) none of these

28. If $\{x\} = [x]$ then number of solutions of the equation is

(a) 2
(b) 3
(c) 1
(d) more than 2

29. Domain of the function $f(x) = \frac{2x-1}{x-3}$ for $x \geq 4$ is

(a) $[2, 7]$
(b) $(2, 7]$
(c) R
(d) $R - \{2\}$

30. Which of the functions is odd

(a) $f(x) = x^{100} + 1$
(b) $f(x) = e^x + e^{-x}$
(c) $f(x) = \frac{1}{|x|}$
(d) None of the above