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

Q.11 Find the value of $\sin^{-1}\left(-\frac{1}{2}\right)+\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)+\cot^{-1}(\sqrt{3})$. (2)

$-\frac{\pi}{6}+\frac{\pi-\pi}{6}+\frac{\pi}{6}=\frac{5\pi}{6}$

Q.12 Solve for x: $\sin(2\tan^{-1}x)=1$ (2)

Q.13 If $\cos\left(\sin^{-1}\frac{2}{\sqrt{5}}+\cos^{-1}x\right)=0$ then find the value of x. (2)

Q.14 Find the principal value of $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$. (2)

Q.15 Express $\tan^{-1}\left(\frac{\cos x}{1-\sin x}\right)$, $-\frac{\pi}{2}<x<\frac{\pi}{2}$ in simplest form (2)

Q.16 Show that the Relation R on R defined by $R=\{(a,b): a\leq b\}$, is reflexive, transitive but not symmetric. (3)

Q.17 A Relation R is defined on $N\times N$ defined by $(a,b)R(c,d)$ if $ad(b+c)=bc(a+d)$. Show that R is an equivalence Relation (3)

Q.18 Show that the function $f: R-\{-1\}\to R-\{1\}$ given by $f(x)=\frac{x}{x+1}$ is bijective (3)

Q.19 Show that a function $f: R\to R$ defined by $f(x)=\frac{2x}{1+x^2}$ is neither one-one nor onto. (3)

Q.20 Prove that $\cot^{-1}\left[\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right]=\frac{x}{2}$; $0<x<\frac{\pi}{2}$ (3)

CLASS – 12th
SUBJECT – MATHS
TOPIC :- Relations & functions, Inverse Trigonometric Functions

TIME: 1 HOUR M.M: 3.5

Q.1 Let the Relation R in the set $A=\{x\in Z: 0\le x\le 12\}$ given by $R=\{(a,b): |a-b| \text{ is a multiple of } 4\}$. Then equivalence class containing 1 is

(a) $\{1,5,9\}$ (b) $\{0,1,2,5\}$ (c) ϕ (d) A

Q.2 A relation R in set $A=\{1,2,3\}$ is defined as $R=\{(1,1),(1,2),(2,2),(3,3)\}$. Which of the following ordered pair in R shall be removed to make it an equivalence relation

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

Q.3 If $A=\{1,2,3\}$, then the maximum number of equivalence relation on A is

(a) 2 (b) 3 (c) 4 (d) 5

Q.4 Let $A=\{a,e,i,o,u\}$. Then the number of reflexive relation on set A

(a) 2^5 (b) 2^{10} (c) 2^{20} (d) 2^8

Q.5 If $A=\{a,b,c\}$ and $B=\{-3,-1,0,1,3\}$, then the number of one-one function that can be defined from A to B is

(a) 125 (b) 243 (c) 60 (d) 120

Q.6 A function $f: R\to A$ defined by $f(x)=x^2+1$ is onto, if A is

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

Q.7 The function $f: R\to[-1,1]$ defined by $f(x)=\cos x$ is

(a) both one-one and onto (b) Not one-one but onto
(c) one-one but not onto (d) Neither one-one nor onto.

Q.8 If $A=\{0,1,2,3,4\}$ and $B=\{a,b\}$ then number of onto functi from A to B is

(a) 5_{P_2} (b) 31 $2^{n}-2 = 2^{5}-2 = 30$ (c) 30 (d) None of these

Q.9 $\sin\left[\frac{\pi}{3}+\sin^{-1}\left(\frac{1}{2}\right)\right]$ is equal to

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

Q.10 The domain of the function $f(x)=\sin^{-1}(2x)$ is: