ONE TWO ACADEMY

Unit Test - 04

TOTAL:- 45 **GENERAL MATHEMATICS** **STD XII**

Inverse Trigonometric functions

Choose the correct answer:- ***5 x 1 = 5***

1)The principal value of $\sin^{-1}\sin\frac{2\pi}{3}$.

(1) $\frac{-2\pi}{3}$. (2) $\frac{2\pi}{3}$ (3) $\frac{\pi}{3}$ (4)$\frac{5\pi}{3}$

2) Find the odd one out:-[based on periodicity]

(1) sin x (2) e^{ix} (3) tan x (4)sec x

3)Identify the incorrect statement regarding tangent function:-

(1) The graph is not continuous.

(2) It has neither maximum nor minimum.

(3) It has infinitely many horizontal asymptotes.

(4) It has discontinuity points at x = $n\pi + \frac{\pi}{2}, nEZ$

4) The principal value of cosec^{-1} (-1) is (1) π (2)$\frac{\pi}{2}$ (3) $-\pi/2$ (4) 0.

5) Calculate the period of the following function $y = \sin\left(\frac{1}{4}x\right) + \cos\left(\frac{1}{2}x\right)$.

(1) 4π (2) π (3) 8π (4)$\frac{1}{4\pi}$.

Answer any five of the following (Question no 13 is compulsory):- ***5 x 2 = 10***

6) Why the term amplitude can't be defined for tan x?

7)Why do we define inverse trigonometric functions in their restricted domain?

8)For what value of x does $\sin^{-1}x = \sin x$?

9)Find the domain of g(x) = $\sin^{-1}x + \cos^{-1}x$.

10)Find the value of $\tan^{-1}\tan(\frac{5\pi}{4})$.

11)Calculate the domain of the secant function.

12)What is a bijection?

13)Distinguish between $\sin x = \frac{1}{2}$ and $x = \sin^{-1}(\frac{1}{2})$.

Answer any five of the following(Question no 20 is compulsory):- ***5 x 3 = 15***

14)Sketch the graph of $y = \sin(\frac{x}{3})$ for $0 <= x <= 6\pi$.

15)Find the value of $\sin^{-1}[\sin\frac{5\pi}{9}\cos\frac{\pi}{9} + \cos\frac{5\pi}{9}\sin\frac{\pi}{9}]$.

16) State the reason for $\cos^{-1}[\cos(-\frac{\pi}{6})] =/= -\frac{\pi}{6}$.

17)For what value of x, the inequality $\frac{\pi}{2} < cos^{-1}(3x-1) < \pi$ holds ?

18)Find the domain of $\tan^{-1}(\sqrt{(9-x^2)})$.

19)If $\cot^{-1}(\frac{1}{7}) = \theta$, find the value of $\cos\theta$.

20) Prove that $\tan^{-1}\frac{2}{11} + \tan^{-1}\frac{7}{24} = \tan^{-1}\frac{1}{2}$.

Answer the following:- ***3 x 5 = 15***

1)Find the domain of $\sin^{-1}(2 - 3x^2)$.

[OR]

Prove that $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \tan^{-1}(\frac{x+y+z-xyz}{1-xy-yz-zx})$.

2)Find the number of solutions of the equation $\tan^{-1}(x-1) + \tan^{-1}x + \tan^{-1}(x+1) = \tan^{-1}(3x)$.

[OR]

Find the value of $\cot^{-1}(1) + \sin^{-1}(\frac{-\sqrt{3}}{2}) - \sec^{-1}(-\sqrt{2})$.

3)Draw the graph of $y = \sin x$ in $[\frac{\pi}{2}, \frac{\pi}{2}]$ and hence draw the graph of $y = \sin^{-1}x$ and enlist the properties (any 2) with it.

[OR]

Draw the graph of the cosecant function and mention its domain and range.

ALL THE BEST