

SECTION - F

1) Match The Following

(2005 - 6M)

Column I**Column II**

a) $\sum_{i=1}^{\infty} \tan^{-1} \left(\frac{1}{2i^2} \right) = t$, then $\tan t =$

a) 1

b) Sides a, b, c of a triangle ABC are in AP and $\cos \theta_1 = \frac{a}{b+c}, \cos \theta_2 = \frac{b}{a+c}, \cos \theta_3 = \frac{c}{a+b}$ then $\tan^2 \left(\frac{\theta_1}{2} \right) + \tan^2 \left(\frac{\theta_3}{2} \right) =$

b) $\frac{\sqrt{5}}{3}$

c) $\frac{2}{3}$

c) A line is perpendicular to $x + 2y + 2z = 0$ and passes through $(0,1,0)$. The perpendicular distance of this line from the origin is

2) Let (x, y) be such that $\sin^{-1}(ax) + \cos^{-1}(bxy) = \frac{\pi}{2}$.

Match the statements in Column 1 with statements in Column II and indicate your answer by darkening the appropriate bubble in the 4x4 matrix given in the ORS.

a) If $a = 1$ and $b = 0$, then (x, y) a) lies on the circle $x^2 + y^2 = 1$ b) If $a = 1$ and $b = 1$, then (x, y) b) lies on $(x^2 - 1)(y^2 - 1) = 0$ c) If $a = 1$ and $b = 2$, then (x, y) c) lies on $y = x$ d) If $a = 2$ and $b = 2$, then (x, y) d) lies on $(4x^2 - 1)(y^2 - 1) = 0$ **DIRECTIONS(Q.3):** Following questions has matching lists. The codes for the lists have choices (a), (b), (c) and (d) out of which ONLY ONE is correct.

3) a) $\left(\frac{1}{y^2} \left(\frac{\cos(\tan^{-1} y) + y \sin(\tan^{-1} y)}{\cot(\sin^{-1} y) + \tan(\sin^{-1} y)} \right)^2 + y^4 \right)^{\frac{1}{2}}$ takes value

a) $\frac{1}{2} \sqrt{\frac{5}{3}}$

b) If $\cos x + \cos y + \cos z = 0 = \sin x + \sin y + \sin z$ then possible value of $\cos \frac{x-y}{2}$ is

b) $\sqrt{2}$

c) $\frac{1}{2}$

c) If $\cos \left(\frac{\pi}{4} - x \right) \cos 2x + \sin x \sin 2x \sec x = \cos x \sin 2x \sec x + \cos \left(\frac{\pi}{4} + x \right) \cos 2x$ then possible value of $\sec x$ is

d) 1

d) If $\cot(\sin^{-1} \sqrt{1-x^2}) = \sin(\tan^{-1}(x\sqrt{6}))$, $x \neq 0$ **Codes:**

	P	Q	R	S
(a)	4	3	1	2
(b)	4	3	2	1
(c)	3	4	2	1
(d)	3	4	1	2