Obtain Mark:	**Trigonometry**	Time: 50 min
Date: 08/08/2024		Total Mark: 96

1. If A+B+C= π prove that, cotBcotC+cotCcotA+cotAcotB = 1. **(08)**
2. If **x=10** prove that, $\cos(2x)^0\cos(4x)^0\cos(6x)^0\cos(8x)^0 = \frac{1}{16}$. **(08)**
3. Prove it,$(\cos\theta+i\sin\theta)^3 = \cos3\theta+i\sin3\theta$, when $I = \sqrt{-1}$. **(08)**
4. If $\sin\theta = \frac{a-b}{a+b}$ prove that, $\tan(\frac{\pi}{4} - \frac{\theta}{2}) = \pm\sqrt{\frac{b}{a}}$. **(08)**
5. Prove that, $\tan\frac{45^0+\theta}{2} + \tan\frac{45^0-\theta}{2} = \frac{\sqrt{2}\cos\theta-1}{\sqrt{2}\cos\theta+1}$. **(08)**
6. If $\sin\alpha = \frac{m^2-n^2}{m^2+n^2}$ prove that, $\frac{\tan(\alpha-\beta)+\tan\beta}{1-\tan(\alpha-\beta)\tan\beta} = \frac{m^2-n^2}{2mn}$. **(08)**
7. If $\tan\theta = \sqrt{\frac{1-e}{1+e}}\tan\frac{\theta}{2}$ show that, $\sec\theta = \frac{1-e\cos x}{\cos x-e}$. **(08)**
8. If x=5 prove it , $\frac{1}{\sin(2x)^0} - \frac{\sqrt{3}}{\cos(2x)^0} = 4$ **(08)**
9. If $\alpha+\beta=\theta$ and $\cos\alpha = k\cos\beta$, then prove that, $\tan\frac{1}{2}(\alpha-\beta) = \frac{1-k}{1+k}\cot\frac{\theta}{2}$. **(08)**
10. If $\operatorname{cosec}A + \sec A = \operatorname{cosec}B + \sec B$, then show that, $\tan A\tan B = \cot\frac{1}{2}(A+B)$. **(08)**
11. Given, $\tan\frac{\theta}{2} = \tan^3\frac{\Phi}{2}$ and $\tan\Phi = 2\tan\alpha$ now prove it , $\theta+\Phi = 2\alpha$. **(08)**
12. Evaluate: $\cos^2\frac{\pi}{8} + \cos^2\frac{3\pi}{8} + \cos^2\frac{5\pi}{8} + \cos^2\frac{7\pi}{8}$. **(08)**