SREE VIDYANIKETHAN International School

Class: XII (IIT) **Holiday Homework** **Subject: Mathematics**

1. $\cos x + \cos^2 x = 1$, then $\sin^8 x + 2\sin^6 x + \sin^4 x =$
   (1) 0 (2) 1 (3) 2 (4) -1
2. If $k = (\sec A + \tan A)(\sec B + \tan B)(\sec C + \tan C) = (\sec A - \tan A)(\sec B - \tan B)(\sec C - \tan C)$, then $k =$
   (1) 0 (2) ±1 (3) ±3 (4) ±4
3. If $x = \sin 130^\circ + \cos 130^\circ$, then
   (1) $x < 0$ (2) $x = 0$ (3) $x > 0$ (4) $x \geq 0$
4. If cos A, sin A, cot A are in G.P., then, $\tan^6 A - \tan^2 A =$
   (1) -1 (2) 0 (3) 1 (4) 2
5. If $x = a\cos^3\theta \sin^2\theta$, $y = a\sin^3\theta\cos^2\theta$ and $\frac{(x^2+y^2)^p}{(xy)^q}$, $(p, q \in N)$ is independent of θ, then
   (1) $p + q = 6$ (2) $4p = 5q$ (3) $4q = 5p$ (4) $pq = 16$
6. If $\theta = \pi/21$, then $\frac{\sin 23\theta - \sin 7\theta}{\sin 2\theta + \sin 14\theta} =$
   (1) 1 (2) -1 (3) 2 (4) -2
7. If $\tan 22^\circ + \tan 38^\circ - \sqrt{3} = k \tan 22^\circ \tan 38^\circ$, the $k =$
   (1) -1 (2) $-\sqrt{3}$ (3) 0 (4) 1
8. If $\cos\alpha = -\frac{12}{13}$, $\cot\beta = \frac{24}{7}$, $90^\circ < \alpha < 180^\circ$ and $180^\circ < \beta < 270^\circ$, then quadrant in which $\alpha + \beta$ lies
   (1) I (2) II (3) III (4) IV
9. $\cos^2(A-B) + \cos^2 B - 2\cos(A-B)\cos A \cos B =$
   (1) $\sin^2 A$ (2) $\sin^2 B$ (3) $\cos^2 A$ (4) $\cos^2 B$
10. If $\cos(x-y) + \cos(y-z) + \cos(z-x) = -\frac{3}{2}$, then $\sum\cos x =$
    (1) 0 (2) 1 (3) 2 (4) 3
11. If $\tan\frac{\alpha}{2}, \tan\frac{\beta}{2}$ are the roots of $8x^2 - 26x + 15 = 0$, then $\cos(\alpha + \beta) =$
    (1) $\frac{627}{725}$ (2) $-\frac{627}{725}$ (3) $-\frac{547}{725}$ (4) $\frac{547}{725}$
12. $\cos 9^\circ - \sin 9^\circ =$
    (1) $-\frac{\sqrt{5-\sqrt{5}}}{2}$ (2) $\frac{5+\sqrt{5}}{4}$ (3) $\frac{1}{2}\sqrt{5-\sqrt{5}}$ (4) $\sqrt{5-\sqrt{5}}$
13. The value of $\cos^2 76^\circ + \cos^2 16^\circ - \cos 76^\circ \cos 16^\circ =$
    (1) ¼ (2) ¾ (3) 5/4 (4) ½
14. $32\sin^6 15^\circ - 48\sin^4 15^\circ + 18\sin^2 15^\circ =$
    (1) 1 (2) 2 (3) 3 (4) -1
15. $x = \cos 55^\circ$, $y = \cos 65^\circ$, $z = \cos 175^\circ$, then $xy + yz + zx =$
    (1) $-\frac{3}{4}$ (2) $\frac{3}{4}$ (3) $\frac{3}{2}$ (4) $\frac{1}{2}$