DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 4**

Topic :- TRIGONOMETRIC FUNCTIONS

1. If the equation $\sin^4\theta + \cos^4\theta = a$ has a real solution then
   a) $a \le \frac{1}{2}$ b) $a \ge \frac{1}{2}$ c) $\frac{1}{2} \le a \le 1$ d) $a \ge 0$
2. The general solution of the equation $(\sqrt{3}-1)\sin\theta + (\sqrt{3}+1)\cos\theta = 2$ is
   a) $2n\pi \pm \frac{\pi}{4} + \frac{\pi}{12}$
   b) $n\pi + (-1)^n\frac{\pi}{4} + \frac{\pi}{12}$
   c) $2n\pi \pm \frac{\pi}{4} - \frac{\pi}{12}$
   d) $n\pi + (-1)^n\frac{\pi}{4} - \frac{\pi}{12}$
3. If $\sin A = \frac{1}{\sqrt{10}}$ and $\sin B = \frac{1}{\sqrt{5}}$, where A and B are positive acute angles, then $A + B$ is equal to
   a) π b) $\frac{\pi}{2}$ c) $\frac{\pi}{3}$ d) $\frac{\pi}{4}$
4. The general solution of $\sin^2\theta\sec\theta + \sqrt{3}\tan\theta = 0$ is
   a) $\theta = n\pi + (-1)^{n+1}\frac{\pi}{3}, \theta = n\pi, n \in I$ b) $\theta = n\pi, n \in I$
   c) $\theta = n\pi + (-1)^{n+1}\frac{\pi}{3}, n \in I$ d) $\theta = \frac{n\pi}{2}, n \in I$
5. If $y + \cos\theta = \sin\theta$ has a real solution, then
   a) $-\sqrt{2} \le y \le \sqrt{2}$ b) $y > \sqrt{2}$ c) $y \le -\sqrt{2}$ d) None of these
6. If $\cos(\theta - \alpha) = a, \sin(\theta - \beta) = b$, then $\cos^2(\alpha - \beta) + 2ab\sin(\alpha - \beta)$ is equal to
   a) $4a^2b^2$ b) $a^2 - b^2$ c) $a^2 + b^2$ d) $-a^2b^2$
7. The equation $8\sec^2\theta - 6\sec\theta + 1 = 0$ has
   a) Exactly two roots b) Exactly four roots c) Infinitely many roots d) No roots
8. If the sides a,b,c of a triangle ABC are the roots of the equation $x^3 - 13x^2 + 54x - 72 = 0$, then the value of $\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c}$ is equal to
   a) $\frac{169}{144}$ b) $\frac{61}{72}$ c) $\frac{61}{144}$ d) $\frac{169}{72}$
9. $\cos^4\theta - \sin^4\theta$ is equal to
   a) $1 + 2\sin^2\left(\frac{\theta}{2}\right)$ b) $2\cos^2\theta - 1$ c) $1 - 2\sin^2\left(\frac{\theta}{2}\right)$ d) $1 + 2\cos^2\theta$
10. The value of $\cos 15° \cos 7\frac{1}{2}° \sin 7\frac{1}{2}°$ is
    a) $\frac{1}{2}$ b) $\frac{1}{8}$ c) $\frac{1}{4}$ d) $\frac{1}{16}$
11. If θ lies in the second quadrant, then the value of $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} + \sqrt{\frac{1+\sin\theta}{1-\sin\theta}}$ is equal to
    a) $2\sec\theta$ b) $-2\sec\theta$ c) $2\,\mathrm{cosec}\,\theta$ d) None of these
12. The value of $\cos^2 A\,(3 - 4\cos^2 A)^2 + \sin^2 A\,(3 - 4\sin^2 A)^2$ is equal to
    a) $\cos 4A$ b) $\sin 4A$ c) 1 d) None of these

13. Let the angles A,B,C of ΔABC be in A.P. and let
a) $75°$ b) $45°$ c) $60°$ d) $15°$

14. If $\tan x = \frac{b}{a}$, then $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}} =$
a) $\frac{2\sin x}{\sqrt{\sin 2x}}$ b) $\frac{2\cos x}{\sqrt{\cos 2x}}$ c) $\frac{2\cos x}{\sqrt{\sin 2x}}$ d) $\frac{2\sin x}{\sqrt{\cos 2x}}$

15. If $\sin A + \cos A = m$ and $\sin^3 A + \cos^3 A = n$, then
a) $m^3 - 3m + n = 0$ b) $n^3 - 3n + 2m = 0$ c) $m^3 - 3m + 2n = 0$ d) $m^3 + 3m + 2n = 0$

16. The most general solutions of the equation $\sec x - 1 = (\sqrt{2} - 1)\tan x$ are given by
a) $n\pi + \frac{\pi}{8}$ b) $2n\pi, 2n\pi + \frac{\pi}{4}$ c) $2n\pi$ d) None of these

17. If $\cos(\theta - \alpha) = a, \cos(\theta - \beta) = b$, then $\sin^2(\alpha - \beta) + 2ab\cos(\alpha - \beta)$ is equal to
a) $a^2 + b^2$ b) $a^2 - b^2$ c) $b^2 - a^2$ d) $-a^2 - b^2$

18. The sum $S = \sin\theta + \sin 2\theta + ... + \sin n\theta$ equals
a) $\sin\frac{1}{2}(n+1)\theta \sin\frac{n\theta}{2} / \sin\frac{\theta}{2}$ b) $\cos\frac{1}{2}(n+1)\theta \sin\frac{n\theta}{2} / \sin\frac{\theta}{2}$
c) $\sin\frac{1}{2}(n+1)\theta \cos\frac{n\theta}{2} / \sin\frac{\theta}{2}$ d) $\cos\frac{1}{2}(n+1)\theta \cos\frac{n\theta}{2} / \sin\frac{\theta}{2}$

19. The sides of an equilateral triangle, a square and a regular hexagon circumscribed in a circle are in
a) A.P. b) G.P. c) H.P. d) None of these

20. If $\frac{\tan 3\theta - 1}{\tan 3\theta + 1} = \sqrt{3}$, then the general value of θ is
a) $\frac{n\pi}{3} - \frac{\pi}{12}$ b) $n\pi + \frac{7\pi}{12}$ c) $\frac{n\pi}{3} + \frac{7\pi}{36}$ d) $n\pi + \frac{\pi}{12}$