DPP No. 2

SYLLABUS : FUNDEMENTALS OF MATHEMATICS

1. $\cos\frac{\pi}{8}\cos\frac{3\pi}{8}\cos\frac{5\pi}{8}\cos\frac{7\pi}{8}$ is equal to

(A) $\frac{1}{2}$ (B) $\frac{1-\sqrt{2}}{2\sqrt{2}}$ (C) $\frac{1}{8}$ (D) $\frac{1+\sqrt{2}}{2\sqrt{2}}$

2. The value of tan 1° tan 2° tan 3° ... tan 89° is

(A) 1 (B) 0 (C) ∞ (D) $\frac{1}{2}$

3. If tan 25° = x, then $\frac{\tan155°-\tan115°}{1+\tan155°\tan115°}$ is equal to

(A) $\frac{1-x^2}{2x}$ (B) $\frac{1+x^2}{2x}$ (C) $\frac{1+x^2}{1-x^2}$ (D) $\frac{1-x^2}{1+x^2}$

4. The value of tan 203° + tan 22° + tan 203° tan 22° is

(A) – 1 (B) 0 (C) 1 (D) 2

5. The value of $\sin\frac{\pi}{18}\cdot\sin\frac{5\pi}{18}\cdot\sin\frac{7\pi}{18}$ is equal to

(A) $\frac{1}{8}$ (B) $\frac{1}{16}$ (C) $\frac{1}{4}$ (D) none of these

6. If in a triangle ABC $\tan\frac{A}{2}$, $\tan\frac{B}{2}$, $\tan\frac{C}{2}$ are in A.P, then cos A, cos B, cos C are in

(A) H.P (B) A.P (C) G.P (D) none of these

7. The value of tan 3A – tan 2A – tan A is equal to

(A) tan 3A tan 2A tan A

(B) – tan 3A tan 2A tan A

(C) tan A tan 2A – tan 2A tan 3A – tan 3A tan A

(D) none of these

8. The value of $\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ}$ is

(A) 1 (B) $\sqrt{3}$ (C) $\frac{\sqrt{3}}{2}$ (D) 2

9. The value of $\frac{1}{\cos 290^\circ} + \frac{1}{\sqrt{3}\sin 250^\circ}$ is

(A) $\frac{2\sqrt{3}}{3}$ (B) $\frac{4\sqrt{3}}{3}$ (C) $\sqrt{3}$ (D) none

10. If A lies in the third quadrant and 3 tan A – 4 = 0, then 5 sin 2A + 3sinA + 4 cosA is equal to

11. If cos A = 3/4, then the value of $16\cos^2 (A/2) - 32 \sin (A/2) \sin (5A/2)$ is

12. If $f(\theta) = \sin^4 \theta + \cos^2 \theta$, then range of $f(\theta)$ is

(A) $\left[\frac{1}{2}, 1\right]$ (B) $\left[\frac{1}{2}, \frac{3}{4}\right]$ (C) $\left[\frac{3}{4}, 1\right]$ (D) None of these

13. The difference between maximum and minimum value of the expression $y = 1 + 2 \sin x + 3 \cos^2 x$ is

(A) $\frac{16}{3}$ (B) $\frac{13}{3}$ (C) 7 (D) 8

14. If $\sec \theta - \tan \theta = q$. Then the value of $\sec \theta$ is :

(A) $q + \frac{1}{q}$ (B) $q - \frac{1}{q}$ (C) $\frac{1}{2}\left(q + \frac{1}{q}\right)$ (D) None of these

15. If $\tan \alpha + \cot \alpha = a$ then the value of $\tan^4 \alpha + \cot^4 \alpha$ =

(A) $a^4 + 4a^2 + 2$ (B) $a^4 - 4a^2 + 2$ (C) $a^4 - 4a^2 - 2$ (D) $a^4 - 2a^2 + 2$

16. If $a \cos \theta + b \sin \theta = 3$ & $a \sin \theta - b \cos \theta = 4$ then $a^2 + b^2$ has the value =

17. The numerical value of $\sin 12^\circ \cdot \sin 48^\circ \cdot \sin 54^\circ$ is equal to

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{16}$ (D) $\frac{1}{8}$

18. The value of $\cos 0 + \cos\frac{\pi}{7} + \cos\frac{2\pi}{7} + \cos\frac{3\pi}{7} + \cos\frac{4\pi}{7} + \cos\frac{5\pi}{7} + \cos\frac{6\pi}{7}$ is

19. The number of values of x in the interval $[0, 3\pi]$ satisfying the equation $2 \sin^2 x + 5 \sin x - 3 = 0$ is

(A) 6 (B) 1 (C) 2 (D) 4

20. The solution set of the equation $4\sin\theta.\cos\theta - 2\cos\theta - 2\sqrt{3}\sin\theta + \sqrt{3} = 0$ in the interval $(0, 2\pi)$ is

(A) $\left\{\frac{3\pi}{4}, \frac{7\pi}{4}\right\}$ (B) $\left\{\frac{\pi}{3}, \frac{5\pi}{3}\right\}$ (C) $\left\{\frac{3\pi}{4}, \pi, \frac{\pi}{3}, \frac{5\pi}{3}\right\}$ (D) $\left\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{11\pi}{6}\right\}$

21. The general solution of equation $\sin x + \sin 5x = \sin 2x + \sin 4x$ is:

(A) $\frac{n\pi}{2}$; $n \in I$ (B) $\frac{n\pi}{5}$; $n \in I$ (C) $\frac{n\pi}{3}$; $n \in I$ (D) $\frac{2n\pi}{3}$; $n \in I$

22. The general solution of the equation $2\cos 2x = 3.2\cos^2 x - 4$ is

(A) $x = 2n\pi$, $n \in I$ (B) $x = n\pi$, $n \in I$ (C) $x = n\pi/4$, $n \in I$ (D) $x = n\pi/2$, $n \in I$

23. If $2\cos^2(\pi + x) + 3\sin(\pi + x)$ vanishes then the values of x lying in the interval from 0 to 2π are

(A) $x = \pi/6$ or $5\pi/6$ (B) $x = \pi/3$ or $5\pi/3$ (C) $x = \pi/4$ or $5\pi/4$ (D) $x = \pi/2$ or $5\pi/2$

24. If $\sin\theta + 7\cos\theta = 5$, then $\tan(\theta/2)$ is a root of the equation

(A) $x^2 - 6x + 1 = 0$ (B) $6x^2 - x - 1 = 0$ (C) $6x^2 + x + 1 = 0$ (D) $x^2 - x + 6 = 0$

25. A triangle ABC is such that $\sin(2A + B) = \frac{1}{2}$. If A, B, C are in A.P. then the angle A, B, C are respectively.

(A) $\frac{5\pi}{12}, \frac{\pi}{4}, \frac{\pi}{3}$ (B) $\frac{\pi}{4}, \frac{\pi}{3}, \frac{5\pi}{12}$ (C) $\frac{\pi}{3}, \frac{\pi}{4}, \frac{5\pi}{12}$ (D) $\frac{\pi}{3}, \frac{5\pi}{12}, \frac{\pi}{4}$

ANSWER KEY OF DPP NO. : 02

1.	**(C)**	**2.**	**(A)**	**3.**	**(A)**	**4.**	**(C)**	**5.**	**(A)**
6.	**(B)**	**7.**	**(A)**	**8.**	**(C)**	**9.**	**(B)**	**10.**	**(0)**
11.	**(3)**	**12.**	**(C)**	**13.**	**(A)**	**14.**	**(C)**	**15.**	**(B)**
16.	**(25)**	**17.**	**(D)**	**18.**	**(1)**	**19.**	**(D)**	**20.**	**(D)**
21.	**(C)**	**22.**	**(B)**	**23.**	**(A)**	**24.**	**(B)**	**25.**	**(B)**