TRIGONOMETRY DPP (BACK LOG COURSE)

1. An arc of a circle of radius 7 cm subtends an angle of 30° at the center, then the length of this arc is
   (a) 11 cm (b) $11/3$ cm (c) $11/2$ cm (d) 22 cm
2. Which statement is correct?
   (a) $\sin 1° > \sin 1$ (b) $\sin 1° < \sin 1$
   (c) $\sin 1° = \sin 1$ (d) $\sin 1° = (\pi/180)\sin 1$
3. Which statement is incorrect?
   (a) $\sin\theta = -1/5$ (b) $\cos\theta = 1$ (c) $\sec\theta = 1/2$ (d) $\tan\theta = 20$
4. If $\sin\alpha = 12/13$, where $0 < \alpha < \pi/2$ and $\cos\beta = -3/5$, where $\pi < \beta < 3\pi/2$, then the value of $\cos(\alpha+\beta)$ is
   (a) $33/65$ (b) $63/65$ (c) $-33/65$ (d) $-63/65$
5. The value of $\sin 50° - \sin 70° + \sin 10°$ is equal to
   (a) 1 (b) 0 (c) $1/2$ (d) 2
6. The value of $(\sin 20° \sin 40° \sin 60° \sin 80°)$ is equal to
   (a) $-3/16$ (b) $5/16$ (c) $3/16$ (d) $-5/16$
7. If $\sin\theta + \operatorname{cosec}\theta = 2$, then $\sin^2\theta + \operatorname{cosec}^2\theta$ is equal to
   (a) 1 (b) 4 (c) 2 (d) None of these
8. The minimum and maximum value of $3\cos x + 4\sin x + 5$ is
   (a) 0, 10 (b) –5, 5 (c) –2, 12 (d) None of these
9. The maximum value of $\sin(x+\pi/6) + \cos(x+\pi/6)$ in the interval $(0, \pi/2)$ is attained at
   (a) $\pi/12$ (b) $\pi/6$ (c) $\pi/3$ (d) $\pi/2$
10. The value of $\tan 1° \tan 2° \tan 3° .... \tan 89°$ is
    (a) 1 (b) 0 (c) ∞ (d) $1/2$
11. If α is a root of $25\cos^2\theta + 5\cos\theta - 12 = 0$, $\pi/2 < \alpha < \pi$, then $\sin 2\alpha$ is equal to
    (a) $24/25$ (b) $-24/25$ (c) $13/18$ (d) $-3/18$
12. If $A = \cos^2\theta + \sin^4\theta$, then for all values of θ,
    (a) $1 \le A \le 2$ (b) $13/16 \le A \le 1$
    (c) $3/4 \le A \le 13/16$ (d) $3/4 \le A \le 1$
13. The expression $3\left[\sin^4(3\pi/2-\alpha) + \sin^4(3\pi+\alpha)\right] - 2\left[\sin^6(\pi/2+\alpha) + \sin^6(5\pi-\alpha)\right]$ is equal to
    (a) 0 (b) 1 (c) 3 (d) $\sin 4\alpha + \cos 6\alpha$
14. If $x = \cos 10° \cos 20° \cos 40°$, then the value of x is
    (a) $(1/4)\tan 10°$ (b) $(1/8)\cot 10°$ (c) $(1/8)\operatorname{cosec} 10°$ (d) $(1/8)\sec 10°$
15. The value of $\sin(45°+\theta) - \cos(45°-\theta)$ is
    (a) $2\cos\theta$ (b) 0 (c) $2\sin\theta$ (d) 1
16. If $\cos(\theta+\phi) = m\cos(\theta-\phi)$, then $\tan\theta$ is equal to

(a) $\left[(1+m)/(1-m)\right]\tan\phi$ (b) $\left[(1-m)/(1+m)\right]\tan\phi$

(c) $\left[(1-m)/(1+m)\right]\cot\phi$ (d) $\left[(1+m)/(1-m)\right]\cot\phi$

17. $(1+\cos\pi/8).(1+\cos 3\pi/8).(1+\cos 5\pi/8).(1+\cos 7\pi/8)$ is equal to

(a) $1/2$ (b) $\cos\pi/8$ (c) $1/8$ (d) $\left(1+\sqrt{2}\right)\left(2\sqrt{2}\right)$

18. If in ΔABC, $\angle A = 90°$ and c, $\sin B$, $\cos B$ are rational numbers then

(a) a is rational (b) a is irrational (c) b is irrational (d) None of these

19. If $\tan\theta = n\tan\phi$, then maximum value of $\tan^2(\theta-\phi)$ is

(a) $\frac{(n+1)^2}{4n}$ (b) $\frac{(n-1)^2}{4n}$ (c) $\frac{(2n+1)^2}{4n}$ (d) $\frac{(2n-1)^2}{4n}$

20. If $A = \sin^8\theta + \cos^{14}\theta$, then for all values of θ,

(a) $A \geq 1$ (b) $0 < A \leq 1$ (c) $1 < 2A \leq 3$ (d) None of these

21. The value of $\left(\frac{1}{2\sin 10°} - 2\sin 70°\right)$ is

(a) $-\frac{\sqrt{3}}{2}$ (b) -1 (c) 1 (d) $\frac{\sqrt{3}}{2}$

22. The graph of the function $f(x) = \cos x\cos(x+2) - \cos^2(x+1)$ is

(a) a straight line passing through $(0, -\sin^2 1)$ with slope 2

(b) a straight line passing through $(0, 0)$

(c) a parabola with vertex $(1, -\sin^2 1)$

(d) a straight line passing through the point $\left(\frac{\pi}{2}, -\sin^2 1\right)$ and parallel to the x-axis

23. The value of $\sqrt{2\cot\alpha + \frac{1}{\sin^2\alpha}}$ is, if $\frac{3\pi}{4} < \alpha < \pi$

(a) $1+\cot\alpha$ (b) $-1-\cot\alpha$ (c) $\pm(1+\cot\alpha)$ (d) None of these

24. The range of $|\sin x + \cos x|$ is

(a) $\left[0, \sqrt{2}\right]$ (b) $\left[\sqrt{2}, 2\right]$ (c) $[1, 2]$ (d) $[2, \infty)$

25. If θ and ϕ are acute angles satisfying $\sin\theta = \frac{1}{2}$, $\cos\phi = \frac{1}{3}$, then $\theta + \phi \in$

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(a) $\left(\frac{\pi}{3}, \frac{\pi}{2}\right]$ (b) $\left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$ (c) $\left(\frac{2\pi}{3}, \frac{5\pi}{6}\right)$ (d) $\left(\frac{5\pi}{6}, \pi\right)$

1. (b)	2. (b)	3. (c)	4. (a)	5. (b)
6. (c)	7. (c)	8. (a)	9. (a)	10. (a)
11. (b)	12. (d)	13. (b)	14. (b)	15. (b)
16. (c)	17. (c)	18. (a)	19. (b)	20. (b)
21. (c)	22. (d)	23. (b)	24. (a)	25. (b)