MATHS

BOOKS - MTG WBJEE MATHS (HINGLISH)

TRIGONOMETRIC FUNCTIONS

Wb Jee Workout Category 1 Single Option Correct Type 1 Mark

1. $\cos A = \frac{3}{4} \Rightarrow 32 \sin\left(\frac{A}{2}\right)\sin\left(\frac{5A}{2}\right) =$

A. 7

B. 8

C. 11

D. none of these

Answer: C

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2. $\left(1+\cos.\frac{\pi}{8}\right)\left(1+\cos.\frac{3\pi}{8}\right)\left(1+\cos.\frac{5\pi}{8}\right)\left(1+\cos.\frac{7\pi}{8}\right)$ is equal to

A. $\frac{1}{2}$

B. $\cos\pi/8$

C. $\frac{1}{8}$

D. $\frac{1+\sqrt{2}}{2\sqrt{2}}$

Answer: C

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3. If $\sin 2\theta = \cos 3\theta$ and θ is an acute angle , then $\sin\theta$ is equal to

A. $\frac{\sqrt{5}-1}{4}$

B. $-\left(\frac{\sqrt{5}-1}{4}\right)$

C. $\frac{\sqrt{5}+1}{4}$

D. $\frac{-\sqrt{5}-1}{4}$

Answer: A

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4. If $5\cos 2\theta + 2\cos^2\frac{\theta}{2} + 1 = 0$, when $(0 < \theta < \pi)$, then the values of θ are

A. $\pi/3$

B. $\pi/3, \cos^{-1}(3/5)$

C. $\cos^{-1}(3/5)$

D. $\pi/3, \pi - \cos^{-1}(3/5)$

Answer: D

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5. The equation $(\cos p - 1)x^2 + \cos px + \sin p = 0$ where x is a variable, has real roots. then the interval of p may be any one of the following :

A. $(0, 2\pi)$

B. $(-\pi, 0)$

C. $(-\pi/2, \pi/2)$

D. $(0, \pi]$

Answer: D

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6. The value of $\sin\left(\frac{\pi}{14}\right)\sin\left(\frac{3\pi}{14}\right)\sin\left(\frac{5\pi}{14}\right)$ is

A. $1/16$

B. $1/8$

C. $1/2$

D. none of these

Answer: B

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7. If $\cos\theta + \sqrt{3}\sin\theta = 2$, then $\theta =$

A. $\pi/3$

B. $2\pi/3$

C. $4\pi/3$

D. $5\pi/3$

Answer: A

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8. if $1 + \sin x + \sin^2 x + \sin^3 x + \ldots\ldots\ldots \infty = 4 + 2\sqrt{3}, \quad 0 < x < \pi$ and $x \neq \frac{\pi}{2}$ then x

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$ or $\frac{\pi}{6}$

D. $\frac{\pi}{3}$ or $\frac{2\pi}{3}$

Answer: D

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9. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta)$, then $\cos\left(\theta - \frac{\pi}{4}\right) = \pm\frac{1}{2\sqrt{2}}$.

A. $\pm\frac{1}{2}$

B. $\pm\frac{1}{\sqrt{2}}$

C. $\pm\frac{1}{2\sqrt{2}}$

D. $\pm\frac{1}{4}$

Answer: C

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10. Solve: $\cot\theta + \cos ec\theta = \sqrt{3}$

A. $2n\pi + \pi/6$

B. $2n\pi + \pi/3$

C. $2n\pi - \pi/6$

D. none of these

Answer: B

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11. If $y\frac{\sec^2\theta - \tan\theta}{\sec^2\theta + \tan\theta}$,then

A. $\frac{1}{3} \leq y \leq 3$

B. $y \notin \left[\frac{1}{3}, 3\right]$

C. $-3 < y < -\frac{1}{3}$

D. none of these

Answer: A

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12. The number of solutions of the equation $\sin^2 x = 1/4i$

A. 2

B. 3

C. 4

D. none of these

Answer: D

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13. The solution of the equation $\cos^2\theta + \sin\theta + 1 = 0$ lies in the interval

A. $(-\pi/4, \pi/4)$

B. $(\pi/4, 3\pi/4)$

C. $(p3\pi/4, 5\pi/4)$

D. $(5\pi/4, 7\pi/4)$

Answer: D

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14. The general value of θ satisfying the equation $2\sin^2\theta - 3\sin\theta - 2 = 0$ is

A. $n\pi + (-1)^n \pi/6$

B. $n\pi + (-1)^n \pi/2$

C. $n\pi + (-1)^n 5\pi/6$

D. $n\pi + (-1)^n 7\pi/6$

Answer: D

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15. The value of $\cos\frac{\pi}{11}+\cos\frac{3\pi}{11}+\cos\frac{5\pi}{11}+\cos\frac{7\pi}{11}+\cos\frac{9\pi}{11}$, is

A. 0

B. $-1/2$

C. $1/2$

D. none of these

Answer: C

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16. If $A+B+C=\pi$ then $\sin 2A+\sin 2B+\sin 2C=$

A. $4\cos A\cos B\cos C$

B. $4\sin A\sin B\sin C$

C. $2\sin A\sin B\sin C$

D. $8 \sin A \sin B \sin C$

Answer: B

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17. If $\sin^2 x - \cos x = 1/4$, then the values of x between 0 and 2π are

A. $\pi/3, 5\pi/3$

B. $\pi/3, -\pi/3$

C. $2\pi/3, \pi/3$

D. $2\pi/3, 5\pi/3$

Answer: A

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18. If $A + B + C = \pi$, then $\cos 2A + \cos 2B + \cos 2C =$

A. $1 + 4\cos A \cos B \sin C$

B. $-1 + 4\sin A \sin B \cos C$

C. $-1 - 4\cos A \cos B \cos C$

D. none of these

Answer: C

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19. If $x = \sin\alpha, y = \sin\beta, z = \sin(\alpha + \beta)$ then $\cos(\alpha + \beta) =$

A. $\frac{z^2 - x^2 - y^2}{xy}$

B. $\frac{z^2 - x^2 - y^2}{2xy}$

C. $\frac{z^2 + x^2 + y^2}{xy}$

D. $\frac{x^2 + y^2 + z^2}{2xy}$

Answer: B

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20. The general solution ofthe trigonometrical equation $\sin x + \cos x = 1$ for $n = 0, \pm 1, \pm 1$ is given by (a) $x = 2n\pi$ (b) $x = 2n\pi + \frac{\pi}{2}$ (c) $x = n\pi + (-1)^n \frac{\pi}{4} - \frac{\pi}{4}$ (d) non of these

A. $x = 2n\pi$

B. $x = 2n\pi + \pi/2$

C. $x = n\pi + (-1)^n \pi/4 - \pi/4$

D. none of these

Answer: C

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21. If A, B, C are the angles of a triangle then $\sin^2 A + \sin^2 B + \sin^2 C - 2\cos A \cos B \cos C$ is equal to

A. 1

B. 2

C. 3

D. 4

Answer: B

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22. If $\sin 5x + \sin 3x + \sin x = 0$, then the value of x other than zero between $0 \leq x \leq \pi/2$ is

A. $\pi/6$

B. $\pi/12$

C. $\pi/3$

D. $\pi/9$

Answer: C

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23. In a ΔABC, $\cot\frac{A}{2}+\cot\frac{B}{2}+\cot\frac{C}{2}=$

A. 0

B. $\cot\frac{1}{2}\mathrm{A}\ \cot\frac{1}{2}\mathrm{B}\ \cot\frac{1}{2}C$

C. 1

D. none of these

Answer: B

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24. The equation $\cos x+\sin x=2$ has

A. Only one solution

B. Two solution

C. No solution

D. Infinite number of solutions

Answer: C

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25. The general value of θ satisfying $\tan^2 2\theta = 3$, is

A. $2n\pi \pm \pi/3$

B. $n\pi \pm 2\pi/3$

C. $n\pi/2 \pm \pi/6$

D. none of these

Answer: C

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26. If $\tan p\theta - \tan q\theta = 0$, then the values of θ form a series in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: A

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27. Find the general solutions of the following equation: $tan2\theta tan\theta = 1$

A. $\pi/3$

B. $(6n \pm 1)\pi/6$

C. $(4n \pm 1)\pi/6$

D. $2n\pi \pm \pi/6$

Answer: B

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28. If $0 < A < B < \pi, \sin A - \sin B = \frac{1}{\sqrt{2}}, \cos A - \cos B = \sqrt{\frac{3}{2}}$, then $A + B =$

A. $\frac{2\pi}{3}$

B. $\frac{5\pi}{6}$

C. π

D. $\frac{4\pi}{3}$

Answer: D

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29. The set of values of x for which $\frac{\tan 3x - \tan 2x}{1 + \tan 3x \tan 2x} = 1$ is

A. ϕ

B. $\{\pi/4\}$

C. $\{n\pi + \pi/4 : n = 1, 2, 3, \ldots\}$

D. $\{2n\pi + \pi/4 : n = 1, 2, 3, \ldots\}$

Answer: A

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30. If $\sin A = \sin B, \cos A = \cos B,$ then the value of A im terms of B, is

A. $n\pi / B$

B. $n\pi + (-1)^n B$

C. $2n\pi + B$

D. $2n\pi - B$

Answer: C

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Wb Jee Workout Category 2 Single Option Correct Type 1 Mark

1. Given $A = \sin^2\theta + \cos^2\theta$, then for all real θ, $1 \leq A \leq 2$ (b) $\frac{3}{4} \leq A \leq 1$ $\frac{13}{16} \leq A \leq 1$ (d) $\frac{3}{4} \leq A \leq \frac{13}{16}$

A. $1 \leq A \leq 2$

B. $\frac{3}{4} \leq A \leq 1$

C. $\frac{13}{16} \leq A \leq 1$

D. $\frac{3}{4} \leq A \leq \frac{13}{16}$

Answer: B

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2. If $\frac{\cos\theta}{p} = \frac{\sin\theta}{q}$, then $\frac{p}{\sec 2\theta} + \frac{q}{\cos ec\, 2\theta}$ is equal to (i) p (ii)q (iii)pq (iv) none of these

A. p

B. q

C. pq

D. $\frac{p}{q}$

Answer: A

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3. The value of $\cos y \cos\left(\frac{1}{2}\pi - x\right) - \cos\left(\frac{1}{2}\pi - y\right)\cos x + \sin y \cos\left(\frac{1}{2}\pi - x\right) + \cos x \sin$ is zero is

A. $x = 0$

B. $y = 0$

C. $x = y + \pi/4$

D. $x = 3\pi/4 + y$

Answer: D

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4. The equation $a \sin x + \cos 2x = 2a - 7$ possesses a solution if

A. $a > 6$

B. $2 \leq a \leq 6$

C. $a > 2$

D. none of these

Answer: B

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5. If $2 \sin \frac{A}{2} = \sqrt{1 + \sin A} + \sqrt{1 - \sin A}, then \frac{A}{2}$ lies between,

A. $2n\pi + \frac{\pi}{4}$ and $2n\pi + \frac{3\pi}{4}, n \in I$

B. $2n\pi - \frac{\pi}{4}$ and $2n\pi + \frac{\pi}{4}, n \in I$

C. $2n\pi - \frac{3\pi}{4}$ and $2n\pi - \frac{\pi}{4}, n \in I$

D. $-\infty$ and $+\infty$

Answer: A

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6. The value of $\cos$ '(2pi)/(15)cos(4pi)/(15)cos(8pi)/(15)cos$\frac{14\pi}{15}$, is

A. 1

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $\frac{1}{16}$

Answer: D

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7. Find the gereral of the equation

$\sin x - 3\sin 2x + \sin 3x = \cos x - 3\cos 2x + \cos 3x.$

A. $n\pi + \pi/8$

B. $n\pi/2 + \pi/8$

C. $(-1)^n n\pi/2 + \pi/8$

D. $2n\pi + \cos^{-1}(3/2)$

Answer: B

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8. If $\cos x = \tan y$, $\cos y = \tan z$, $\cos z = \tan x$, then the value of $\sin x$ is

A. $2\cos 18^\circ$

B. $\cos 18^\circ$

C. $\sin 18^\circ$

D. $2\sin 18^\circ$

Answer: D

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9. The equation $\sin^6 x + \cos^6 x = a$, has a real solution if

A. $1/2 \leq a \leq 1$

B. $1/4 \leq a \leq 1$

C. $-1 \leq a \leq 1$

D. $0 \leq a \leq 1/2$

Answer: B

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10. $\dfrac{\sin^2 3A}{\sin^2 A} - \dfrac{\cos^2 3A}{\cos^2 A} =$

A. $\cos 2A$

B. $8\cos 2A$

C. $\dfrac{1}{8}\cos 2A$

D. none of these

Answer: B

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11. Find the general solution of the equation $(\sqrt{3}-1)\sin\theta+(\sqrt{3}+1)\cos\theta=2$

A. $2n\pi\pm\pi/4+\pi/12$

B. $n\pi+(-1)^n\pi/4+\pi/12$

C. $2n\pi\pm\pi/4-\pi/12$

D. $n\pi+(-1)^n\pi/4-\pi/12.$

Answer: A

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12. The number of solutions of equation $\tan x + \sec x = 2\cos x$ lying in the interval $[0, 2\pi]$ is

A. 0

B. 1

C. 2

D. 3

Answer: C

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13. If $\sin A + \cos A = m$ an $\sin^3 A + \cos^3 A = n,$ then

A. $m^3 - 3m + n = 0$

B. $n^3 - 3n + 2m = 0$

C. $m^3 - 3m + 2n = 0$

D. $m^3 + 3m + 2n = 0$

Answer: C

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14. If $0 < x < \pi$ and $\cos x + \sin x = \frac{1}{2}$, then $\tan x$ is (1) $\frac{4-\sqrt{7}}{3}$ (2) $-\frac{4+\sqrt{7}}{3}$ (3) $\frac{1+\sqrt{7}}{4}$ (4) $\frac{1-\sqrt{7}}{4}$

A. $-\frac{\left(4+\sqrt{7}\right)}{3}$

B. $\frac{1+\sqrt{7}}{4}$

C. $\frac{1-\sqrt{7}}{4}$

D. $\frac{4-\sqrt{7}}{3}$

Answer: A

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15. In any ΔABC, if

$(\sin A + \sin B + \sin C) \times (\sin A + \sin B - \sin C) = 3 \sin A \sin B,$

then

A. $A = 60^\circ$

B. $B = 60^\circ$

C. $C = 60^\circ$

D. none of these

Answer: C

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Wb Jee Workout Category 3 One Or More Than One Option Correct Type 2 Mark

1. If the value of $\cos\frac{\pi}{15}\cos\frac{2\pi}{15}\cos\frac{3\pi}{15}\cos\frac{4\pi}{15}\cos\frac{5\pi}{15}\cos\frac{6\pi}{15}\cos\frac{7\pi}{15}$ is $\frac{1}{2^k}$, then which of the following is true ?

A. k is prime

B. factors of k are 1,7

C. k is odd

D. k is even

Answer: A::B::C

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2. The value of $\tan 5\theta$ is

A. $\frac{5\tan\theta - 10\tan^3\theta + \tan^5\theta}{1 - 10\tan^2\theta + 5\tan^4\theta}$

B. $\frac{5\tan\theta + 10\tan^3\theta - \tan^5\theta}{1 + 10\tan^2\theta - 5\tan^4\theta}$

C. $\frac{5\tan^5\theta - 10\tan^3\theta + \tan\theta}{1 - 10\tan^2\theta + 5\tan^4\theta}$

D. none of these

Answer: A

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3. Consider the system in ordered pairs (x, y) of real numbers $\sin x + \sin y = \sin(x + y), |x| + |y| = 1$. The number of ordered pairs (x, y) satisfying the system is

A. 2

B. 4

C. 6

D. Infinite

Answer: C

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4. $S = \sum_{r=1}^{4} \tan^2(2r - 1)\frac{\pi}{16}$ is an integer divisible by

A. 2

B. 3

C. 5

D. 7

Answer: A::D

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5. In a triangle ABC ,angle A is greater than B.If the measures of angles Aand B satisfy the equation $3\sin x - 4\sin^3 x - k = 0, 0 < k < 1$, then the measure of angle C, is

A. $\pi/3$

B. $\pi/2$

C. $2\pi/3$

D. $5\pi/6$

Answer: C

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6. let $0 < \phi < \frac{\pi}{2}$, $x = \sum_{n=0}^{\infty} \cos^{2n}\phi$, $y = \sum_{n=0}^{\infty} \sin^{2n}\phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n}\phi \sin^{2n}\phi$

A. $xyz = zx + y$

B. $xyz = xy + z$

C. $xyz = x + y + z$

D. $xyz = yz + x$

Answer: B::C

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7. For a positive integer n , $f_n(\theta) = \left(\frac{\tan\theta}{2}\right)(1+\sec\theta)(1+\sec 2\theta)(1+\sec 4\theta)\ldots.(1+\sec 2^n\theta.)$, then

A. $f_2\left(\frac{\pi}{16}\right) = 1$

B. $f_3\left(\frac{\pi}{32}\right) = 1$

C. $f_4\left(\frac{\pi}{64}\right) = 1$

D. $f_5\left(\frac{\pi}{128}\right) = 1$

Answer: A::B::C::D

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8. If $\tan^3\theta + \cot^3\theta = 8 \ \ \text{cosec}^3 2\theta + 12$, then $\theta =$

A. $\frac{n\pi}{2} - (-1)^n \frac{\pi}{12}$

B. $\frac{n\pi}{2} + (-1)^n \frac{\pi}{12}$

C. $\frac{n\pi}{2} + (-1)^n \frac{7\pi}{12}$

D. $\frac{n\pi}{2} - (-1)^n \frac{7\pi}{12}$

Answer: A::C

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9. The value(s) of θ, which satisfy $3 - 2\cos\theta - 4\sin\theta - \cos 2\theta + \sin 2\theta = 0$ is/are $\theta = 2n\pi; n \in I$ (b) $2n\pi + \frac{\pi}{2}; n \in I$ $2n\pi - \frac{\pi}{2}; n \in I$ (d) $n\pi : n \in I$

A. $n\pi$

B. $2n\pi$

C. $2n\pi + \frac{\pi}{2}$

D. $2n\pi + \frac{\pi}{4}$

Answer: B::C

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10. $\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} =$

A. $\frac{1 - \sin\theta}{\cos\theta}$

B. $\frac{1 + \sin\theta}{\cos\theta}$

C. $\frac{\cos\theta}{1 - \sin\theta}$

D. $\frac{\cos\theta}{1+\sin\theta}$

Answer: B::C

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11. If $\frac{\cos x-\cos\alpha}{\cos x-\cos\beta}=\frac{\sin^2\alpha\cos\beta}{\sin^2\beta\cos\alpha}$, then

A. $\cos x=\frac{\cos\alpha+\cos\beta}{1+\cos\alpha\cos\beta}$

B. $\cos x=\frac{\cos\alpha+\cos\beta}{1-\cos\alpha\cos\beta}$

C. $\tan\frac{x}{2}=\tan\frac{\alpha}{2}\tan\frac{\beta}{2}$

D. $\tan\frac{x}{2}=-\tan\frac{\alpha}{2}\tan\frac{\beta}{2}$

Answer: A::C::D

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12. If $\cos\theta + \cos\phi = \alpha, \cos 2\theta + \cos 2\phi = \beta$ and $\cos 3\theta + \cos 3\phi = \gamma$, then

A. $\cos^2\theta + \cos^2\phi = 1 + \frac{\beta}{2}$

B. $\cos\theta.\cos\phi = \frac{\alpha^2}{2} - \frac{\beta+2}{4}$

C. $2\alpha^2 + \gamma = 3\alpha(1+\beta)$

D. $\alpha + \beta + \gamma = 2\alpha\beta\gamma$

Answer: A::B::C

View Text Solution

13. $\sin x = \sin x^\circ$ if $x =$

A. $\frac{180\pi}{180+\pi}$

B. $\frac{180\pi}{180-\pi}$

C. $\frac{360\pi}{180-\pi}$

D. $\frac{360\pi}{180+\pi}$

Answer: A::C

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14. If $\frac{\cos A}{\cos B} = \frac{x}{y}$, where $A \neq B$, then

A. $\frac{x \tan A + y \tan B}{x + y} = \tan\left(\frac{A + B}{2}\right)$

B. $\frac{x \tan A - y \tan B}{x + y} = \tan\left(\frac{A - B}{2}\right)$

C. $\frac{y \sin A + x \sin B}{y \sin A - x \sin B} = \frac{\sin(A + B)}{\sin(A - B)}$

D. $x \cos A + y \cos B = 0$

Answer: A::B::C

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15. If $\frac{3\pi}{2} < A < 2\pi$ and $\sin A = -7/25$, then

A. $\sin 2A = \frac{336}{625}$

B. $\cos\frac{A}{2} = \frac{\sqrt{2}}{5}$

C. $\tan\frac{A}{2} = -\frac{1}{7}$

D. $\tan\frac{A}{2} = -\frac{\sqrt{2}}{10}$

Answer: A::C

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Wb Jee Previous Years Questions Category 1 Single Option Correct Type 1 Mark

1. For $0 \leq P, Q \leq \frac{\pi}{2}$, if $\sin P + \cos Q = 2$, then the value of $\tan\left(\frac{P+Q}{2}\right)$ is equal to

A. 1

B. $\frac{1}{\sqrt{2}}$

C. $\frac{1}{2}$

D. $\frac{\sqrt{3}}{2}$

Answer: A

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2. The value of $\cos^2 75^\circ + \cos^2 45^\circ + \cos^2 15^\circ - \cos^2 30^\circ - \cos^2 60^\circ$ is

A. 0

B. 1

C. $1/2$

D. $1/4$

Answer: C

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3. Find maximum and minimum value of $\sin^6 \theta + \cos^6 \theta$

A. 1 and 1/4

B. 1 and 0

C. 2 and 0

D. 1 and 1/2

Answer: A

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4. Let $f(\theta) = \left(1 + \sin^2\theta\right)\left(2 - \sin^2\theta\right)$. Then for all values of θ

A. $f(\theta) > \frac{9}{4}$

B. $f(\theta) < 2$

C. $f(\theta) > \frac{11}{4}$

D. $2 \leq f(\theta) \leq \frac{9}{4}$

Answer: D

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5. Find the value $\tan\left(\frac{\pi}{5}\right) + 2\tan\left(\frac{2\pi}{5}\right) + 4\cot\left(\frac{4\pi}{5}\right)$.

A. $\cot\frac{\pi}{5}$

B. $\cot\frac{2\pi}{5}$

C. $\cot\frac{4\pi}{5}$

D. $\cot\frac{3\pi}{5}$

Answer: A

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6. If $\cot\frac{2x}{3} + \tan\left(\frac{x}{3}\right) = \cos ec\frac{kx}{3}$, then the value of k is

A. 1

B. 2

C. 3

D. -1

Answer: B

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7. If $\theta \in \left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$, then the value of $\sqrt{4\cos^4\theta + \sin^2 2\theta} + 4\cot\theta\cos^2\left(\frac{\pi}{4} - \frac{\theta}{2}\right)$ is

A. $-2\cot\theta$

B. $2\cot\theta$

C. $2\cos\theta$

D. $2\sin\theta$

Answer: B

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8. The number of real solutions of the equation $(\sin x - x)\left(\cos x - x^2\right) = 0$ is

A. 1

B. 2

C. 3

D. 4

Answer: C

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9. $\{x \in R \ :|\cos x| \geq \sin x\} \cap \left[0, \frac{3\pi}{2}\right] =$

A. $\left[0, \frac{\pi}{4}\right] \cup \left[\frac{3\pi}{4}, \frac{3\pi}{2}\right]$

B. $\left[0, \frac{\pi}{4}\right] \cup \left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$

C. $\left[0, \frac{\pi}{4}\right] \cup \left[\frac{5\pi}{4}, \frac{3\pi}{2}\right]$

D. $\left[0, \frac{3\pi}{2}\right]$

Answer: A

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10. The value of $\cos 15^\circ \cos\left(7\frac{1}{2}\right)^\circ \sin\left(7\frac{1}{2}\right)^\circ$ is

A. $\frac{1}{2}$

B. $\frac{1}{8}$

C. $\frac{1}{4}$

D. $\frac{1}{16}$

Answer: B

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11. The smallest positive root of the equation $\tan x - x = 0$ lies in $\left(0, \frac{\pi}{2}\right)$ (b) $\left(\frac{\pi}{2}, \pi\right)$ $\left(\pi, \frac{3\pi}{2}\right)$ (d) $\left(\frac{3\pi}{2}, 2\pi\right)$

A. $(0, \pi/2)$

B. $(\pi/2, \pi)$

C. $\left(\pi, \frac{3\pi}{2}\right)$

D. $\left(\frac{3\pi}{2}, 2\pi\right)$

Answer: C

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12. The equation $\sin x(\sin x + \cos x) = k$ has real solutions, where k is a real number. Then

A. $0 \leq k \leq \frac{1+\sqrt{2}}{2}$

B. $2 - \sqrt{3} \leq k \leq 2 + \sqrt{3}$

C. $0 \leq k \leq 2 - \sqrt{3}$

D. $\frac{1-\sqrt{2}}{2} \leq k \leq \frac{1+\sqrt{2}}{2}$

Answer: D

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13. The approximate value of $\sin 31^\circ$ is

A. > 0.5

B. > 0.6

C. < 0.5

D. < 0.4

Answer: A

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14. If $\sin 6\theta + \sin 4\theta + \sin 2\theta = 0$, then general value of θ is

A. $\frac{n\pi}{4}, n\pi \pm \frac{\pi}{3}$

B. $\frac{n\pi}{4}, n\pi \pm \frac{\pi}{6}$

C. $\frac{n\pi}{4}, 2n\pi \pm \frac{\pi}{3}$

D. $\frac{n\pi}{4}, 2n\pi \pm \frac{\pi}{6}$

Answer: A

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15. If $e^{\sin x} - e^{-\sin x} - 4 = 0$, then the number of real values of x is

A. 0

B. 1

C. 2

D. 3

Answer: A

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Wb Jee Previous Years Questions Category 2 Single Option Correct Type 2 Mark

1. If $\sin^2\theta + 3\cos\theta = 2,$ then find value of $\cos^3\theta + \sec^3\theta$:

A. 1

B. 4

C. 9

D. 18

Answer: D

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2. Minimum value of $2^{\sin x} + 2^{\cos x}$ is

A. $2^{1-1/\sqrt{2}}$

B. $2^{1+1/\sqrt{2}}$

C. $2^{\sqrt{2}}$

D. 2

Answer: A

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3. $\cos.\frac{2\pi}{7}+\cos.\frac{4\pi}{7}+\cos.\frac{6\pi}{7}$

A. is equal to zero

B. lies between 0 and 3

C. is a negative number

D. lies between 3 and 6

Answer: C

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