LEVEL-I

1.	If $sin\theta + cos\theta$	$ec\theta = 2$, then the value of $sin^n\theta + cosec^n\theta$, $n \ge 2$, $n \in \mathbb{N}$ equals
	(A) 2	(B) 2 ⁿ
	(C) 1	(D) none of these

2. The maximum value of 1 +
$$\sin\left(\frac{\pi}{4} + \theta\right)$$
 + 2 $\cos\left(\frac{\pi}{4} - \theta\right)$, $\theta \in \mathbb{R}$, equals

(A) 3 (B) 5 (D) none of these (C) 4

The least value of $\cos^2\theta - 6\sin\theta\cos\theta + 3\sin^2\theta + 2$ is 3. (A) $4 + \sqrt{10}$ (B) $4 - \sqrt{10}$ (C) 0 (D) none of these

If $0 < \beta < \alpha \le \frac{\pi}{4}$, $\cos(\alpha + \beta) = \frac{3}{5}$ and $\cos(\alpha - \beta) = \frac{4}{5}$, then $\sin 2\alpha$ is equals 4. (A) 1 (C) 2 (B) 0 (D) none of these

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

(A) 1

(C) $\frac{1}{4}$ (D) none of these

If $\tan\theta$. $\tan\left(\frac{\pi}{3}+\theta\right)$. $\tan\left(\frac{\pi}{3}-\theta\right)=-1$, ($0<\theta<\pi/2$), then value of $3\sin\theta-4\cos^3\theta=-1$ 6.

(A) 1(B) -1(C) $1/\sqrt{2}$ (D) $-1/\sqrt{2}$

7. If in a $\triangle ABC$, $\sin^2 A + \sin^2 B + \sin^2 C = 2$, then the triangle is

(A) isosceles triangle (B) right angled triangle (C) acute angle triangle

(D) obtuse angled triangle

Minimum value of the expression 2 sin x + 4 cos x + $3\sqrt{5}$ is 8.

(B) $2\sqrt{5} + 3$ (C) $2\sqrt{5} - 3$ (D) none of these (A) $5\sqrt{5}$

The maximum value of $4 \sin^2 x + 3 \cos^2 x + \sin x/2 + \cos x/2$ is 9.

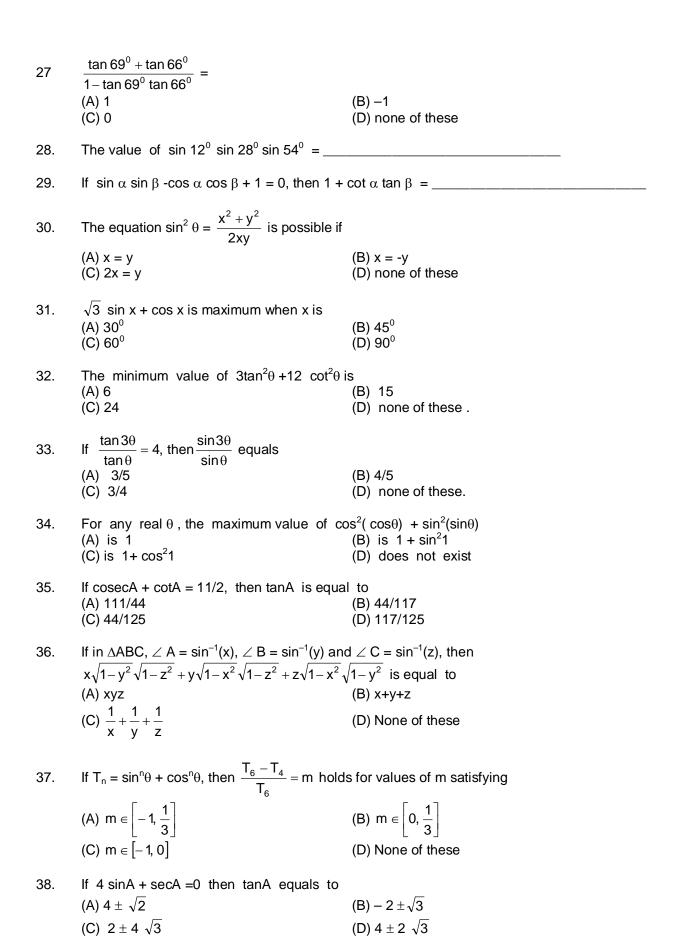
> (A) $4 + \sqrt{2}$ (B) $3 + \sqrt{2}$ (C) 9

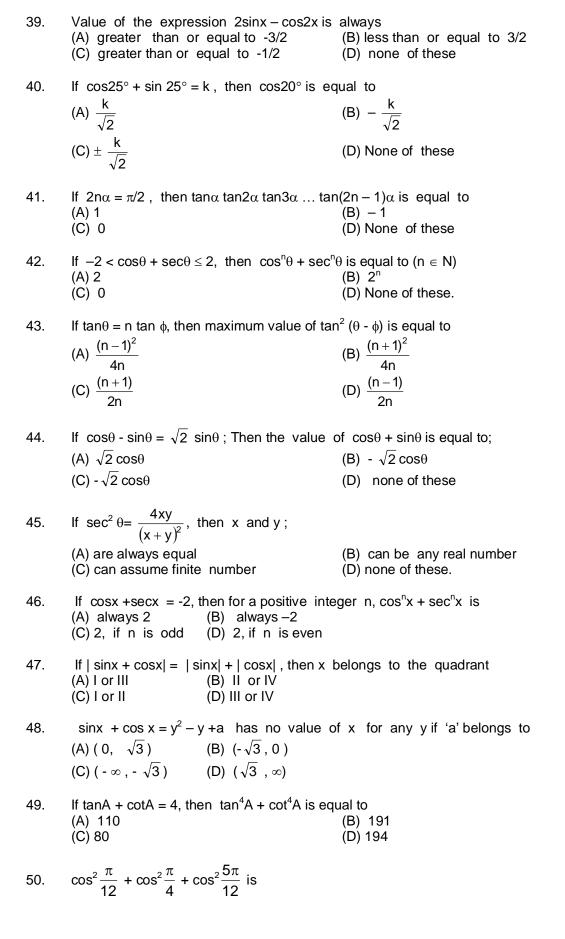
10.

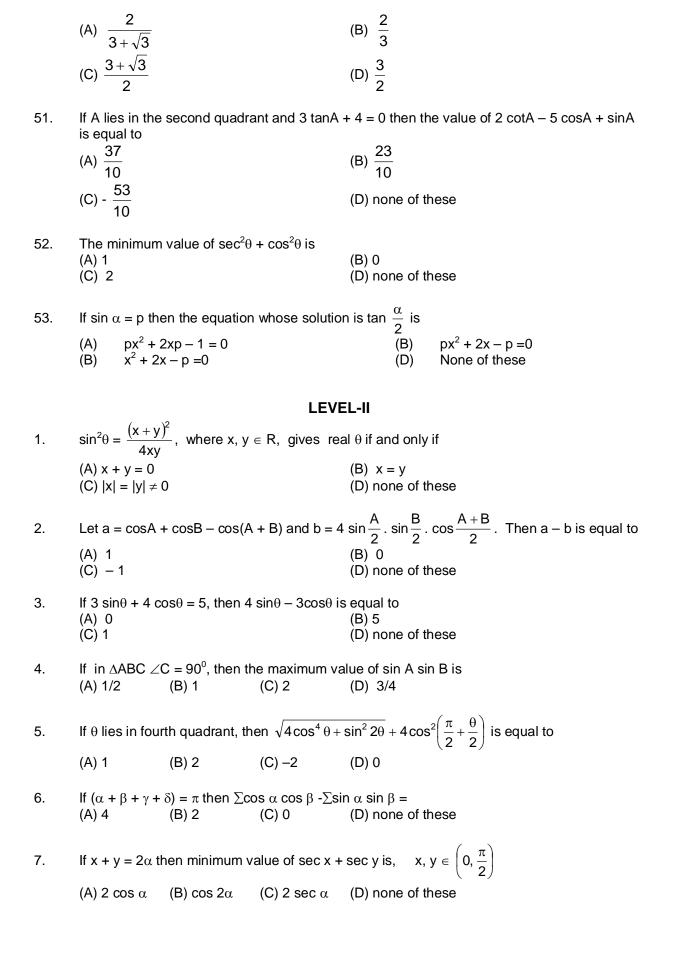
(A) 0(B) $\pi/2$

(C) $\pi/4$ (D) π

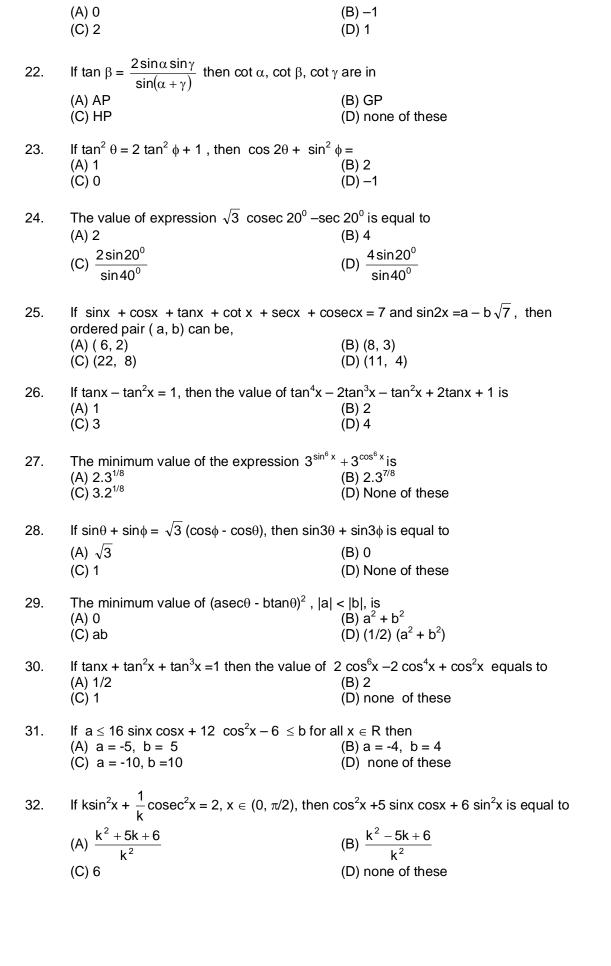
11.	The value of tan 15 ⁰ =				
12.	If $2 \sin \theta$. $\sec 3\theta = \tan 3\theta$ -tan θ , then $2[\sin \theta$. $\sec 3\theta + \sin 3\theta$. $\sec 3^2\theta + \dots + \sin 3^{n-1}\theta$. $\sec 3^n\theta] = \underline{\qquad}$				
13.	If $\tan \theta = \frac{b}{a}$, then a $\cos 2\theta + b \sin 2\theta = \underline{\hspace{1cm}}$				
14.	Maximum value of 2 cos θ + 3 sin θ + 4 is				
15.	If $\sec \theta$ -tan θ = 5, then $\sec \theta$ =				
16.	If $\pi < 2\theta < \frac{3\pi}{2}$, then $\sqrt{2 + \sqrt{2 + 2\cos 4\theta}}$ equals	s to			
	(A) $-2\cos\theta$ (B) $-2\sin\theta$ (C) $2\cos\theta$ (D	D) 2 sin θ			
17.		mber n then sec 20 is B) an irrational number D) none of these.			
18.	If α and β are two distinct roots of the equation to	n a tan x + b sec x = c, then tan $(\alpha + \beta)$ is equal			
	(A) $\frac{a^2 - c^2}{a^2 + c^2}$ (B) $\frac{a^2 + c^2}{a^2 - c^2}$ (C) $\frac{2ac}{a^2 + c^2}$ (D)	$\frac{2ac}{a^2-c^2}$			
19. 20	If $\sin \theta = 3 \sin (\theta + 2\alpha)$ then value of $\tan(\theta + \alpha)$ (A) 3 (B) 2 (C) 1 (D) In a \triangle ABC, if $\cot A \cot B \cot C > 0$, then the \triangle is (A) acute angled (B) right (C) obtuse angled (D) does	0) 0			
21	If $\sin x = \cos^2 x$, then $\cos^2 x (1 + \cos^2 x)$ equals to (A) 0 (B) 1 (C) 2 (D) none				
22	The value of sin 15 ⁰ =				
23	Maximum value of 2 cos θ + 3 sin θ + 5 =				
24	If $\sin \alpha \sin \beta$ - $\cos \alpha \cos \beta$ = 1, then $\tan \alpha$ + $\tan \beta$ =				
25	If $\tan \theta = \frac{x}{y}$, then $x \cos 2\theta + y \sin 2\theta = \underline{\hspace{1cm}}$				
26	` ' '	3) negative D) 1			







8.	$\frac{\tan 70^{\circ} - \tan 9}{\cos 9}$	$\frac{\tan 70^{0} - \tan 20^{0}}{4 \tan 50^{0}} =$					
	4tan50° (A) 1	(B) 1/2	(C) -1	(D) -1/2			
9.	In a triangle /	In a triangle ABC maximum value of sin A + sin B + sin C is					
	(A) $\frac{3\sqrt{3}}{2}$	(B) $\frac{2\sqrt{3}}{2}$	(C) 3√3	(D) $\frac{\sqrt{3}}{2}$			
10.	If 1 + $\sin \theta$ +	$\sin^2 \theta + \sin^3 \theta$	+to ∞ = 4	$4 + 2\sqrt{3}$, $0 < \theta < \pi$, $\theta \neq \pi/2$ then			
	$(A) \theta = \frac{\pi}{6}$	(B) $\theta = \frac{\pi}{3}$	(C) $\theta = \frac{\pi}{6}$	or $\frac{\pi}{3}$ (D) $\theta = \frac{\pi}{3}$ or $\frac{2\pi}{3}$			
11.	The value of	tan 1º tan 2º	tan 3ºta	an 89º			
12.	Value of $\sin\frac{\pi}{9}\sin\frac{2\pi}{9}\sin\frac{3\pi}{9}\sin\frac{4\pi}{9}$ is						
13.	If sinx +	$-\sin^2 x = 1$, then cos ¹²	2 x + 3 \cos^{10} x + 3 \cos^{8} x + \cos^{6} x -	·1 =		
14.	If $\sin (\alpha + \beta)$ is) = 1, sin (α -	β) = $\frac{1}{2}$ when	re α , $\beta \in \left[0, \frac{\pi}{2}\right]$, then $\tan (\alpha + 2\beta) \tan (2\alpha)$	+ β)		
15.	If in a ∆ABC, (A) isosceles (C) acute ano	s triangle	$s + \sin^2 C = 2$,	then the triangle is (B) right angled triangle (D) obtuse angled triangle			
16.		$\theta = x$ and sec $\theta = 1/x$ (B) si	-	nen (C) $(x^2y)^{2/3} - (xy^2)^{2/3} = 1$ (D) $(x^2y)^{2/3} + (xy^2)^{2/3}$	= 1		
17.		n value of cos(cosx) is (B)	-cos1 -1			
18.		+ 1 = 0 are alw		in G.P, then roots of the equation real greater than 1	1		
19.	If A + B = 45°, then (1 + tan A) (1 + tan B) =						
20.	If sin θ, cos θ (A) 1 (C) 0), tan θ are in G	6.P, then cot ⁶	θ -cot ² θ is (B) -1 (D) 2			
21.	If $\sin x + \sin^2 x$	x = 1, then cos	⁸ x + 2 cos ⁶ x	+ cos ⁴ x is			



33.	Value of $\sin^4 \frac{\pi}{8} + \sin^4 \frac{3\pi}{8} + \sin^4 \frac{5\pi}{8} + \sin^4 \frac{5\pi}{8}$ (A) 3/2 (C) $\sqrt{3/2}$	$\frac{7\pi}{8}$ is equal to; (B) $2/3$ (D) $\sqrt{2/3}$				
34.	The minimum value of $\frac{1}{-2\sin x - 2\sqrt{3}\cos x}$ (A) $-\frac{1}{10}$ (C) $\frac{1}{10}$	is equal to $(B) - \frac{1}{\sqrt{3}}$ $(D) \frac{1}{6}$				
LEVEL-III						
1.	In a \triangle ABC, cos2A + 4cos(B + C) sinB sinC (A) 2 cos ² A + cos2B (C) cos ² B + 2 cosA	is equal to (B) cos2B - 2 sin²A (D) none of these				
2.	The value of cot ² 36° cot ² 72° is (A) 1/2 (C) 1/4	(B) 1/3 (D) 1/5				
3.	If $x = \alpha$, β satisfy both the equations a conthen (A) $2a(a+2) = b^2 - p^2$ (C) $2a(a+2) = b^2 + p^2$	$ps^2x + b cosx + 1 = 0$ and $a sin^2x + psinx + 1 = 0$, (B) $2a(a - 2) = b^2 + p^2$ (D) None of these				
4.	The number of points inside or $\tan^4 x + \cot^4 x + 1 = 3\sin^2 y$ is (A) one (B) two (C) four (D) infinite	on the circle $x^2 + y^2 = 4$ satisfying				
5.	The number of ordered 4-tuple (x, y, z, w) (2 $2^{\sin^2 x} 3^{\cos^2 y} 4^{\sin^2 z} 5^{\cos^2 w} \ge 120$ is (A) 0 (B) 144 (C) 81 (D) infinite	$(x, y, z, w \in [0, 10])$ which satisfied the inequality,				
6.	If all the solutions 'x' of $a^{\cos x} + a^{-\cos x} = 6$ (a (A) $[3+2\sqrt{2}, \infty)$ (C) $(1, 3+2\sqrt{2})$	> 1) are real, then set of values of a is(B) (6, 12)(D) none of these.				
7.	A quadrilateral ABCD is circumscribed above (A) AB. $\sin \frac{A}{2}$. $\sin \frac{B}{2} = CD \sin \frac{C}{2} \sin \frac{D}{2}$ (C) AB. $\sin \frac{A}{2}$. $\sin \frac{D}{2} = CD \sin \frac{B}{2} \sin \frac{C}{2}$	but a circle, then (B) AB. $\sin \frac{C}{2} \sin \frac{A}{2} = CD \sin \frac{B}{2} \sin \frac{D}{2}$ (C) None of these.				

ANSWERS

LEVEL -I

- 1.
 - Α 5. В

 - 9. Α
 - 13. Α

 - 17. Α 21. D
 - $\sqrt{13} + 5$ 23.
 - 25.

 - 27. В
 - 0 29. 33. D
 - С 37.
 - 41. Α 45. Α
 - 49. D
 - 52. С
 - 5. В
 - 9. Α
 - 0 13.
 - С 17. D
 - 21.
 - C 25. Α

Α

- 29.
- 33.
- - 5. В

2. 6.

14.

18.

22.

24.

26.

28.

- С
- C
- 10.
- С

 $\sqrt{13} + 4$

D

0

Α

 $\sqrt{3} - 1$

- 3. В 7.
- $2-\sqrt{3}$ 11.
- 13 15.
- 19.
- 5
- D
- 16. Α

4.

8.

12.

Α

D

 $tan3^n\theta$ - $tan\theta$

- 20. Α

- $\sin 18^{0}$ 4
- 30. Α 34. В
- 38. В 42. Α
- 46. D 50. D
- 53. D
- 31. C 35. В 39. Α
- 43. Α 47. Α
- В 51.
- 32. 36.
- Α 40. Α 44. Α

D

48. D

LEVEL -II

- 1. С
- 2. Α 6.
 - С
- 10. D
- 14.
- В 18.
- 22. Α
- 26. D
- 30. С 34.
 - Α
- 11. 1

В

С

3.

7.

- В 15. 2 19.
- С 23.
- 27. Α
- С 31.
- В 8.

4.

3 16 12.

Α

- 16. C A
- 20. В
- 24. 28. В
- 32. D

С

LEVEL -III

- 1. D
- 2. 6.
- D Α
- 3. С 7. Α
- 4.