

# THE ZENITH Questions

For CRT - 05

BY O.P. GUPTA

Max. Marks : 30

INDIRA AWARD WINNER

Time : 60 Minutes

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Topics : Trigonometric Functions

Advanced MATH Classes, 1<sup>st</sup> Floor (Above Master Of Burgers), Opp. HP Petrol Pump, Thana Road, Najafgarh

- Q01. (A) Evaluate :  $\operatorname{cosec}\left(-\frac{25\pi}{6}\right)$ .  
(B) Evaluate :  $\sin(-1470^\circ) + \sqrt{3} \cos(-1470^\circ)$ .  
(C) Express  $2\cos 4x \sin 6x$  as an algebraic sum of sines and/or cosines.  
(D) Simplify :  $\sin 8^\circ + \cos 8^\circ$ . [1×4 = 4]
- Q02. (A) If  $\sin x \cos y = 1/4$  and  $3\tan x = 4\tan y$  then, prove that  $\sin(x+y) = 7/16$ .  
(B) Evaluate :  $\sec(-2310^\circ)$ .  
(C) Find the value of  $\operatorname{cosec} 105^\circ$ .  
(D) Evaluate :  $\cos\left(\frac{\pi}{8}\right)$ .  
(E) Evaluate :  $\sin^2 \frac{\pi}{6} + \cos^2 \frac{\pi}{3} - \tan^2 \frac{\pi}{4}$ . [2×5 = 10]
- Q03. If  $15 \tan x + 8 = 0$ ,  $x$  lies in IV quadrant, then find the remaining trigonometric functions.
- Q04. Prove that :  $\cos 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1$ .
- Q05. Find the angle between hour-hand and minute-hand of a clock at 7:10.
- Q06. Prove that :  $\left(1 + \cos \frac{\pi}{8}\right)\left(1 + \cos \frac{3\pi}{8}\right)\left(1 + \cos \frac{5\pi}{8}\right)\left(1 + \cos \frac{7\pi}{8}\right) = \frac{1}{8}$ . [4×4 = 16]

INDIRA Award Winner O.P. Gupta is author of several popular books on Mathematics for Classes XII and XI. These books can be bought at : [www.iMathematicia.com](http://www.iMathematicia.com).

# Hints & Answers Of CRT-05

Q01. (A)  $-2$ .

(B)  $1$ .

(C)  $\sin 10x + \sin 2x$ .

(D)  $\sin 8^\circ + \cos 8^\circ = \sin 8^\circ + \sin 82^\circ = \sqrt{2} \cos 37^\circ$ .

Q02. (B)  $-\frac{2}{\sqrt{3}}$ .

(C)  $\frac{2\sqrt{2}}{1+\sqrt{3}}$ .

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

(E)  $-\frac{1}{2}$ .

Q03.  $\sin x = -\frac{8}{17}$ ,  $\operatorname{cosec} x = -\frac{17}{8}$ ,  $\cos x = \frac{15}{17}$ ,  $\sec x = \frac{17}{15}$ ,  $\cot x = -\frac{15}{8}$ .

Q04. See **MATHEMATICIA** By O.P. Gupta.

Q05.  $155^\circ$ .

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❖ Dear Student/Teacher,

I would urge you for a little favour. Please notify me about any error (s) which you notice in this (or other Maths) work. It would be beneficial for all the future learners of Maths like us. Any constructive criticism will be well acknowledged.

Please find below my contact info when you decide to offer your valuable suggestions. I am looking forward for a response.

Moreover, I would wish **if you inform your friends/students** about my efforts for Maths so that they may also be benefited.

**Let's learn Maths with smile :-)**

☞ For any clarification(s), please contact :

**O.P. Gupta, Math Mentor**

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