0	ality Checkers	12th Science : Physics Superposition of Waves,	DATE: TIME: 1 hr MARKS: 25		
Only wa	vay to fulfill your dreams	SEAT NO:			
Note:- 1. All Questions are compulsory. 2. Numbers on the right indicate full marks.					
Section A					
Q.1 Select and Write the correct answer.					
1.	1. At resonance the frequency of air column becomes				
	A) double	B) half			
	C) equal to frequency of fork	D) greater than frequency of fork			
2.	A transverse harmonic wave o x and y are in cm and t is in s.	n a string is described by y (x,t) = 3.0 sin (36 The positive direction of x is from left to righ	t + 0.018x + π /4) where nt.		

A) The wave is travelling from right to left.	B) The speed of the wave is 20m/s.
C) Frequency of the wave is 5.7 Hz.	D) The least distance between two successive crests in the wave is 2.5 cm.

3. Two sound waves $y1 = 2 \sin 300 \pi t$ and $y2 = 4 \sin 302 \pi t$ are superimposed. Then the ratio of maximum intensity to minimum intensity of the sound will be



4. Two particles perform linear simple harmonic motion along the same path of length 2A and period T as shown in the graph below. The phase difference between them is



Q.2 Answer the following.

- 1. What are the maximum values of particle (i) velocity (ii) acceleration of a simple harmonic wave?
- 2. Define Wane.
- 3. Define Antinode.

Section B Attempt any Four

(3)

Q.3	Explain concept of a musical scale.	(2)			
Q.4	On what factors do the response of human ear depends?	(2)			
Q.5	Explain quality or timber of a sound.	(2)			
Q.6	Define progressive wave? How ripples on water surface create wave pulse?	(2)			
Q.7	A wire is vibrating in its fifth overtone between two rigid supports of 1.8m apart. Find the distance between successive nodes.	(2)			
Q.8	A wire is having a linear density 0.1 kg/m is kept under a tension of 490N. The wire resonates at a frequency of 400 Hz and the next higher frequency is 450 Hz. Calculate the length of the wire.	(2)			
Section C Attempt any Two					
Q.9	State conditions for node and antinode and hence prove that distance between node and antinode is ' $\lambda\!/4'$	(3)			
Q.10	Explain with diagram superposition of two waves pulses of equal amplitude and opposite phase moving towards each other.	(3)			
Q.11	A set of 8 tuning forks is arranged in a series of increasing order of frequencies. Each fork gives 4 beats per second with the next one and the frequency of last fork is twice that of the irst.	(3)			

Section D Attempt any One

Q.12 How can we practically determine the end correction?

Calculate the frequencies of the first and the last fork.

A sound wave in a certain fluid medium is reflected at an obstacle to form a standing wave. The distance between two successive nodes is 3.75 cm. If the velocity of sound is 1500 m/s, find the frequency.

Q.13 State the characteristics of stationary waves.

(4)