QUES 04:-

A train standing at the outer signal of a railway station blows a whistle of frequency 400 Hz in still air. The train begins to move with a speed of 10 ms^{-1} towards the platform. What is the frequency of the sound for an observer standing on the platform? (sound velocity in air = 330 ms^{-1})

Sol. Given, frequency(ν) =400 Hz, speed of the source(v_s) =10 m/s, speed of sound in air(v) = 330 m/s

As the source is moving towards stationary observer, apparent frequency will be more than the original,

ν' = apparent frequency

$= \frac{v \times \nu}{v - v_s} = \frac{330 \times 400}{330 - 10}$

= 412.5 Hz

This is the required frequency as heard by the stationary observer.