2.   (a)   A student is sitting on a swing which is swinging back and forth with a constant angular amplitude of $45°$. The length of the swing is 5m. A loudspeaker, placed at a short distance away from the swing, produces a sound with a constant frequency of 400Hz. What are the maximum and minimum frequency of the sound heard by the student?

(Speed of sound waves = 330 m/s)   [5 marks]