5 **(a)** Explain what is meant by the *principle of superposition.*

……...

……...

……... [2]

(b) Two identical loudspeakers are driven by the same oscillator of frequency 200 Hz. The loudspeakers are located on a vertical pole, a distance of 4.0 m from each other. A man walks straight towards the lower loudspeaker in a direction perpendicular to the pole, as shown in Fig. 5.1.

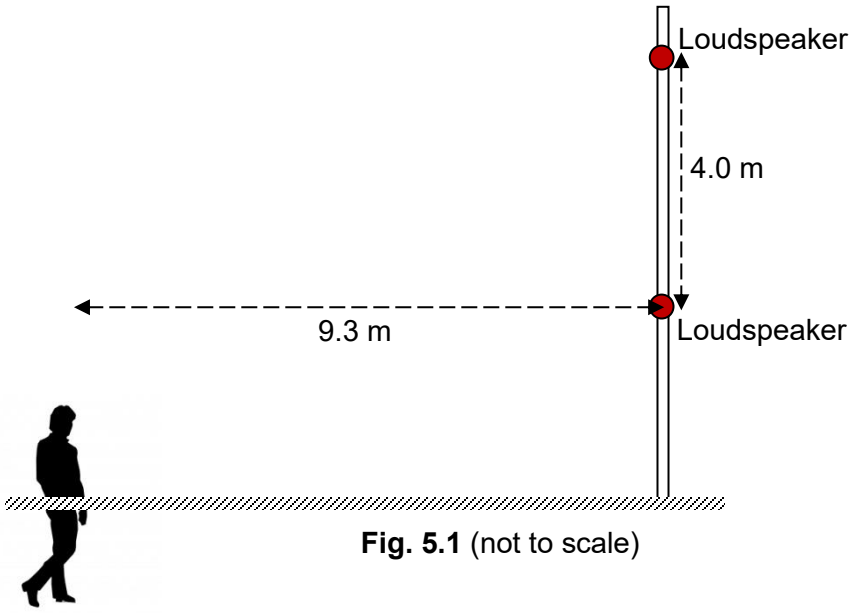

Fig. 5.1 (not to scale)

(i) Calculate the wavelength, λ, of the sound emitted by the loudspeaker, if the speed of sound in air is 330 m s^{-1}.

λ = ... m [1]

(ii) Determine whether the man will hear a maximum or minimum in sound intensity when he is 9.3 m from the pole. You may ignore any sound reflection from the ground.

[3]

(iii) State two changes that can be made to the set-up in Fig. 5.1 in order to increase the number of intensity fluctuations detected by the man as he walks towards the pole.

1. .....
...

.....

2. .....
...

.....[2]