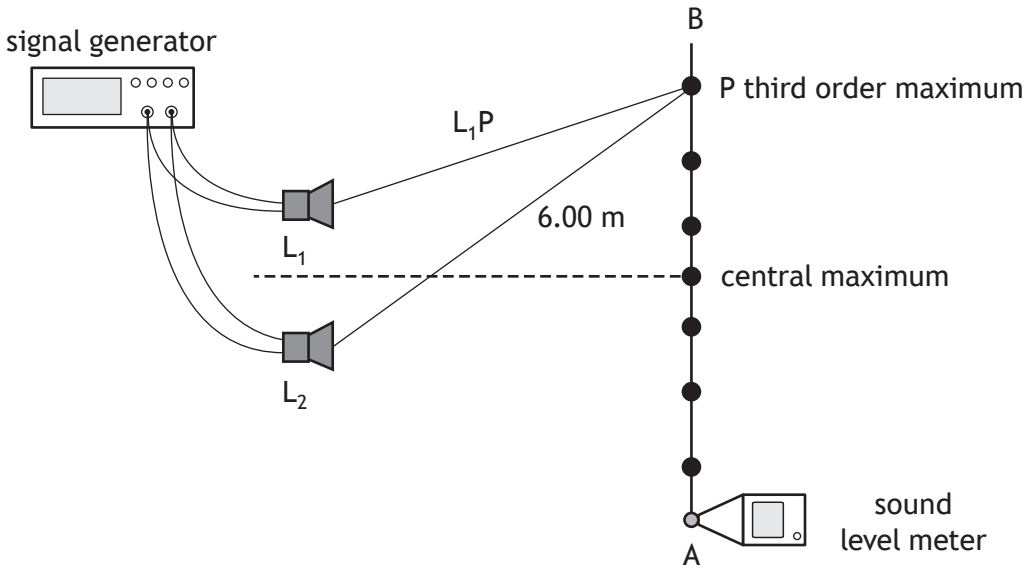
10. A student is carrying out an experiment to investigate the interference of sound waves.

Two identical loudspeakers, L_1 and L_2, are connected to a signal generator as shown.

not to scale



A sound level meter is moved from A to B, and a series of maxima are detected.

(a) The sound waves emitted from the loudspeakers are coherent.

State what is meant by the term *coherent*. **1**

(b) Explain, in terms of waves, how a maximum is produced. **1**

10. (continued)

(c) The wavelength of the soundwaves is 0.400 m.

The distance from L_2 to the third order maximum at point P is 6.00 m.

Determine the distance from L_1 to P. **4**

Space for working and answer

(d) A second student in the room is wearing a pair of active noise cancelling (ANC) headphones.

The student switches on the ANC function. The sound level from the loudspeakers, heard by this student, decreases significantly.

Name the type of interference that the headphones use to reduce the sound level. **1**