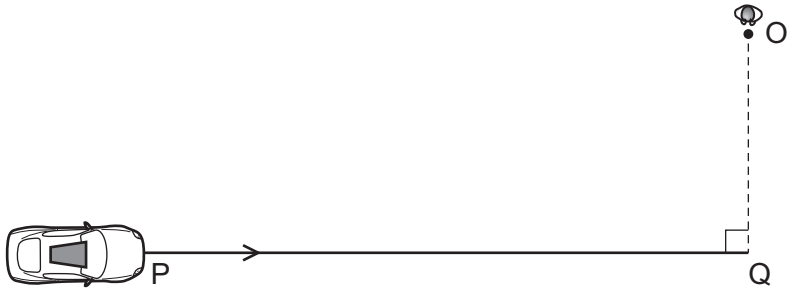
22 A car travels at a constant speed along a straight line PQ.

A loudspeaker attached to the car emits sound of constant frequency *f*. A stationary observer is at point O.



What does the observer hear as the car moves from P towards Q?

A a frequency less than *f* that decreases as the car moves from P towards Q

B a frequency less than *f* that increases as the car moves from P towards Q

C a frequency more than *f* that decreases as the car moves from P towards Q

D a frequency more than *f* that increases as the car moves from P towards Q

23 Some sources of electromagnetic waves in free space are listed.

1 a radio wave transmitter

2 a source of X-rays

3 a 30 mm wavelength radar transmitter

4 a light-emitting diode that emits red light

Which list gives the sources in order of increasing wavelength, from left to right, of the waves emitted by the sources?

A $1 \rightarrow 3 \rightarrow 4 \rightarrow 2$

B $2 \rightarrow 4 \rightarrow 1 \rightarrow 3$

C $2 \rightarrow 4 \rightarrow 3 \rightarrow 1$

D $3 \rightarrow 1 \rightarrow 4 \rightarrow 2$