**5** **(a)** State **two** features of a stationary wave that distinguish it from a progressive wave.

1. ……..……

……..…..

…….

2. …...……
.

…...……...

……..

[2]

**(b)** A microwave emitter is placed in front of a large metal sheet in a vacuum as shown in Fig. 5.1.

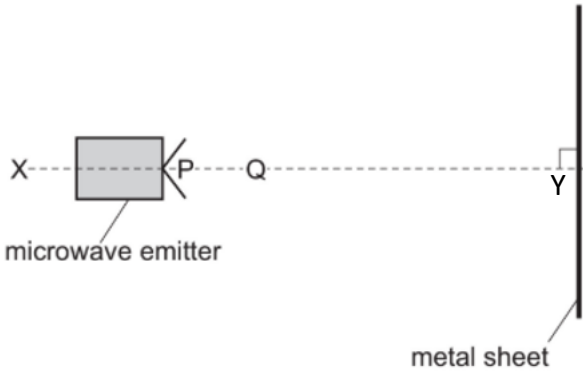


**Fig. 5.1** (not to scale)

The line XY is perpendicular to the metal sheet. Distance between P and Q is 1.5 m.

**(i)** When the emitter is at position P, a stationary wave is formed between the emitter and the sheet.

Explain how the stationary wave is formed between P and Y.

……...

……...

……

…….[2]

**(ii)** A microwave receiver is placed between P and Y. At point P the receiver detects a maximum amplitude of the stationary wave.

The receiver is moved slowly from point P to point Q along the line PY. The receiver detects another 50 maximum amplitudes including the maximum amplitude at Q.

Determine the wavelength of the microwaves.

wavelength = …….. m [2]

**(iii)** Explain whether the number of maximum amplitudes detected between P and Q remains the same, decreases or increases for the following independent changes.

**1.** The frequency of the microwave is increased from **(b)(ii)** while the intensity remains the same.

……..……..
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…..…….

…...……..
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**2.** The intensity of the microwaves is increased while the frequency of the microwaves remains the same as **(b)(ii)**.

…...……..
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…...……..
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…..…..……
.

[4]

[Total: 10]