[Total: 8]

4 **(a)** State two differences between progressive waves and stationary waves.

1. ……...

.....

2. ……...

..... [2]

(b) A source S of microwaves is placed in front of a metal reflector R, as shown in Fig. 4.1.

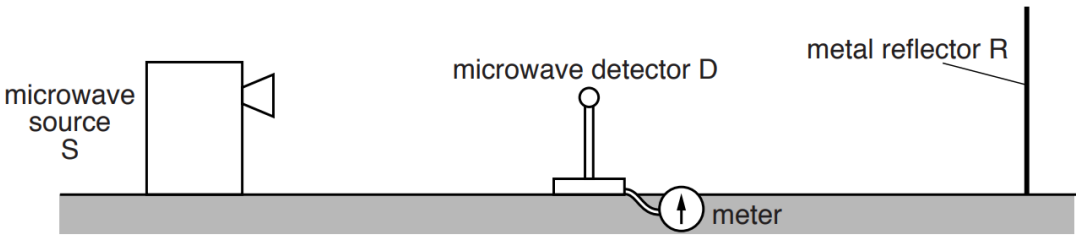

Fig. 4.1 (not to scale)

A microwave detector D is placed between R and S.

Describe

(i) how stationary waves are formed between R and S,

……

……

……

…… [3]

(ii) how D is used to show that stationary waves are formed between R and S,

……

……

…… [2]

(iii) how the wavelength of the microwaves may be determined using the apparatus in Fig. 4.1.

……

……

…… [2]

(c) The metal reflector R in **(b)** is replaced by another microwave source P which is in phase with source S, as shown in Fig. 4.2.

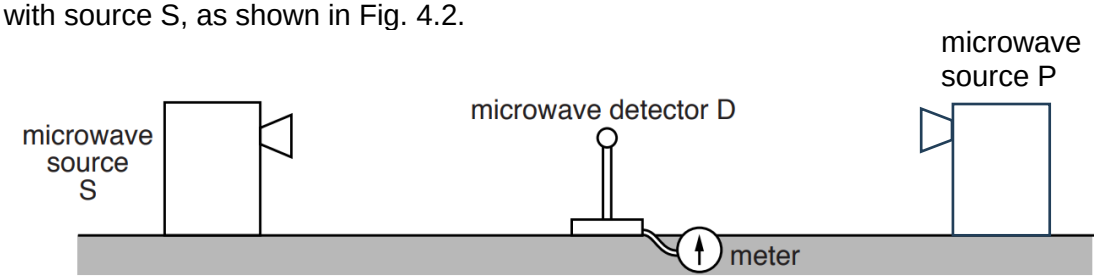

Fig. 4.2 (not to scale)

State and explain the reading of the detector D when it is positioned equidistant from the two sources.

……

……

…… [2]

[Total: 11]