For Examiner's Use

5 **(a)** State three conditions required for maxima to be formed in an interference pattern produced by two sources of microwaves.

1. .....

.....

2. .....

.....

3. .....

.....

[3]

(b) A microwave source M emits microwaves of frequency 12 GHz. Show that the wavelength of the microwaves is 0.025 m.

[3]

(c) Two slits S_1 and S_2 are placed in front of the microwave source M described in **(b)**, as shown in Fig 5.1.

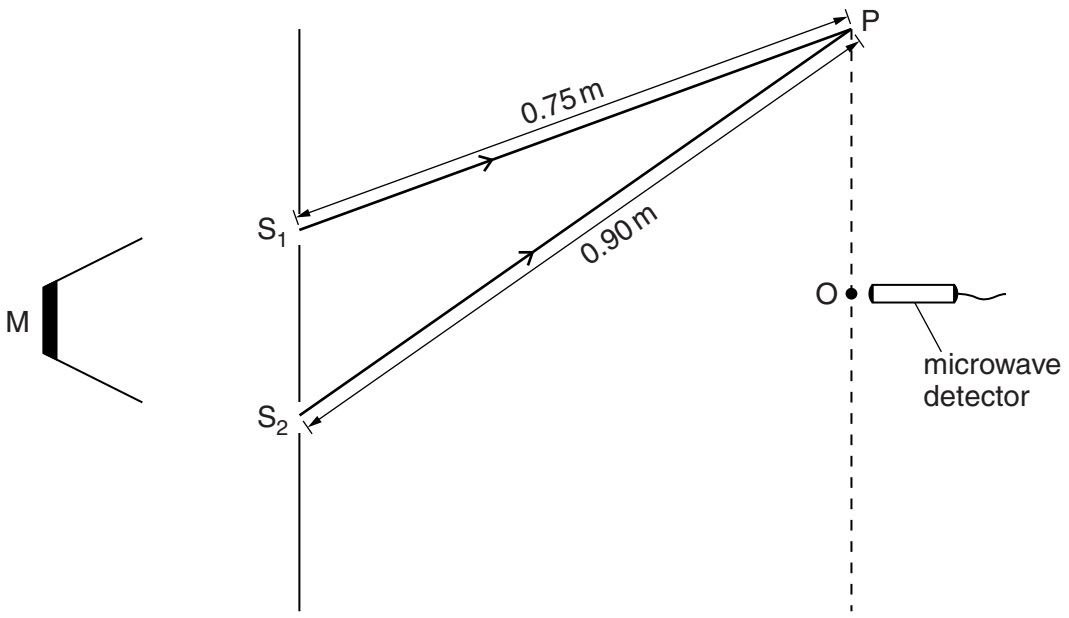

Fig. 5.1 (not to scale)

The distances S_1O and S_2O are equal. A microwave detector is moved from O to P. The distance S_1P is 0.75 m and the distance S_2P is 0.90 m.

The microwave detector gives a maximum reading at O.

For Examiner's Use

State the variation in the readings on the microwave detector as it is moved slowly along the line from O to P.

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..... [3]

(d) The microwave source M is replaced by a source of coherent light.

State two changes that must be made to the slits in Fig. 5.1 in order to observe an interference pattern.

1. .....

2. .....
[2]