3 Fig. 3.1 below shows a beam of red light from a laser shone normally on a double slit of slit separation 20.0 cm.

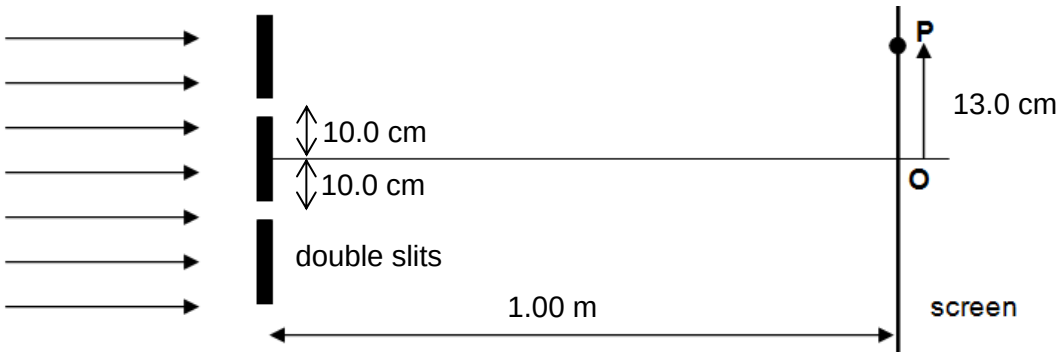

Fig. 3.1

(a) **1.** Draw a sketch of what you will observe on the screen.

[1]

2. Describe the changes you will observe when the screen is placed 2.00 m away from the double slits.

[2]

(b) **(i)** Show that the path difference of the sources at point P is 0.0257 m.

[2]

(ii) **1.** The wavelength of the wave is 1.03 cm. Calculate the phase difference of the waves arriving from the sources at point P.

phase difference = ...rad [2]

2. Hence, explain what will be observed at point P.

.....

..... [1]

(iii) Determine the number low intensity regions observable between point P and point O, including point P and point O.
Show your working clearly.

number of low intensity regions = ... [2]

(c) If the red light is replaced by white light, state and explain what will be observed on the screen.

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.....

.....

..... [3]

[Total: 13]