Practice Question Set For A-Level
**Subject : Physics**
**Paper-1 Topic: Waves**

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

**Name of the Student**:_____
**Max. Marks : 19 Marks** **Time : 19 Minutes**

## Q1.

(a) (i) A piano string has a tension of 681 N. It vibrates with a fundamental frequency (first harmonic) of 92.5 Hz and has a mass per unit length of $1.87 \times 10^{-2}$ kg $m^{-1}$.
Calculate the length of the string.

_____

_____

_____

_____

_____

_____

length of string _____ m

**(3)**

(ii) The figure below shows a string stretched between fixed ends.
Draw onto the figure the first overtone (second harmonic) mode of vibration.



**(1)**

(iii) State how you could make a string on a stringed instrument vibrate in this mode of vibration.

_____

_____

_____

_____

_____

Downloaded from www.merit-minds.com

**(2)**

(b) Describe how you would investigate the variation of the fundamental frequency (first harmonic) of a string with its length.
State which variable(s) you would need to control and how you would do so.
You may wish to assist your account by drawing a diagram.

**(4)**
**(Total 10 marks)**

## Q2.

Just over two hundred years ago Thomas Young demonstrated the interference of light by illuminating two closely spaced narrow slits with light from a single light source.

(a) What did this suggest to Young about the nature of light?

Downloaded from www.merit-minds.com

**(1)**

(b) The demonstration can be carried out more conveniently with a laser. A laser produces *coherent*, *monochromatic* light.

(i) State what is meant by monochromatic.

_____

_____

(ii) State what is meant by coherent.

_____

_____

**(2)**

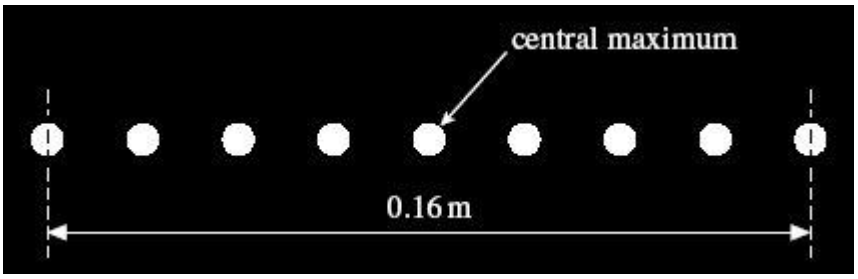
(iii) State **one** safety precaution that should be taken while using a laser.

_____

_____

**(1)**

(c) The diagram below shows the maxima of a two slit interference pattern produced on a screen when a laser was used as a monochromatic light source.




The slit spacing = 0.30 mm.
The distance from the slits to the screen = 10.0 m.

Use the diagram above to calculate the wavelength of the light that produced the pattern.

answer = _____ m

**(3)**

(d) The laser is replaced by another laser emitting visible light with a shorter wavelength.
State and explain how this will affect the spacing of the maxima on the screen.

Downloaded from www.merit-minds.com

_____

_____

_____

_____

**(2)**
**(Total 9 marks)**

Downloaded from www.merit-minds.com