

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Q1.

- (a) The student is using a microphone connected to a cathode ray oscilloscope (CRO).



The CRO displays the sound waves as waves on its screen. What does the microphone do?

(2)

- (b) The amplitude, the frequency and the wavelength of a sound wave can each be either increased or decreased.

- (i) What change, or changes, would make the sound quieter?

(1)

- (ii) What change, or changes, would make the sound higher in pitch?

(1)

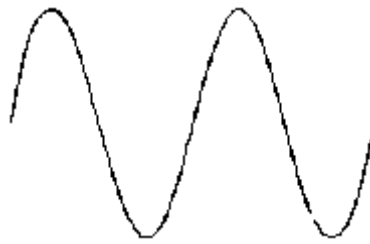
(Total 4 marks)

Q2.

Some students made a small hand-turned a.c. generator, similar to a bicycle dynamo. They connected it to the Y plates of a cathode ray oscilloscope, CRO, and turned the generator slowly. The trace on the CRO looked like this:



They then turned the generator faster and the trace looked like this:



(a) Why did the trace on the CRO show:

(i) an increase in frequency;

(1)

(ii) a decrease in wavelength;

(1)

(iii) an increase in amplitude?

(1)

(b) One way to alter the output from the generator is to change the speed of turning. State **two** other ways to adapt parts of the generator to increase its output.

(2)

(Total 5 marks)

Q3.

(i) Use the words frequency, wavelength and wave speed to write an equation which shows the relationship between them.

(1)

(ii) Calculate the speed of a sound wave with a frequency of 250 Hz and a wavelength of 1.3 m.

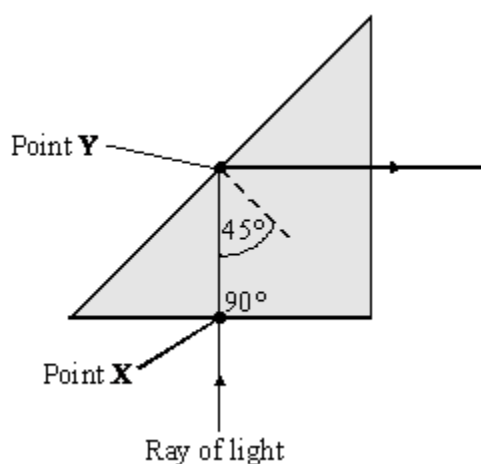
Show how you get to your answer and give the unit.

Speed = _____

(2)

Q4.

The diagram shows a glass prism.



- (i) Explain why refraction has **not** occurred at point X.

(1)

- (ii) (A) Give the full name for the process which has occurred at point Y.

(1)

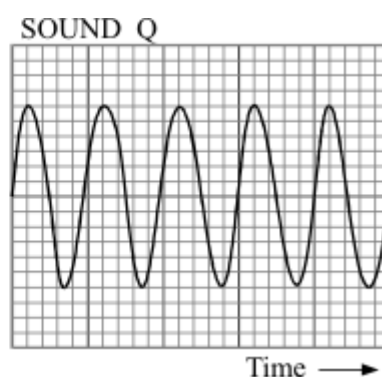
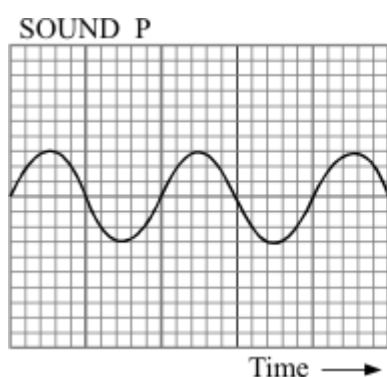
- (B) Explain why this process has occurred.

(2)

(Total 4 marks)

Q5.

The diagram shows the oscilloscope traces of two different sounds P and Q. The oscilloscope setting is exactly the same in both cases.



P and Q **sound** different.

Write down **two** differences in the way they sound.

Explain your answers as fully as you can.

1. _____

2. _____

(Total 5 marks)