

FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA



B.Sc. MLS degree programme

Year end examination – year 1 June, 2015 – 6<sup>th</sup> Batch

Basic Sciences –Physics – Theory

29<sup>th</sup> June 2015

One (01) hour

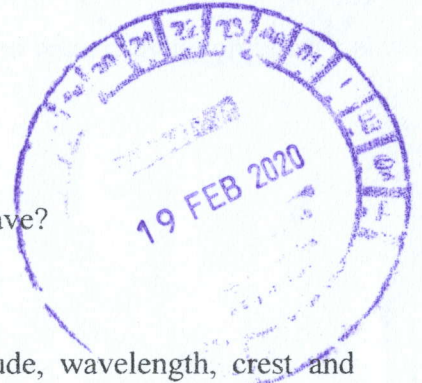
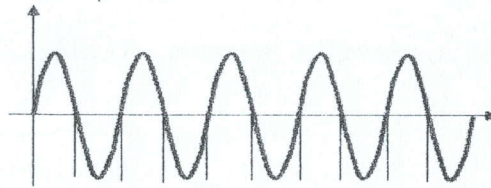
Answer all **four** questions

8

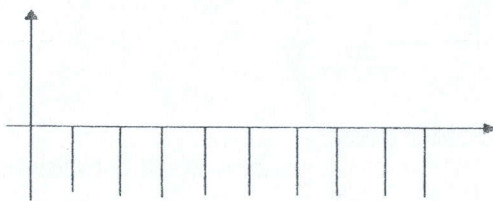
1. (a) How are sound waves created?

(b) What is the major difference between a sound wave and a light wave?

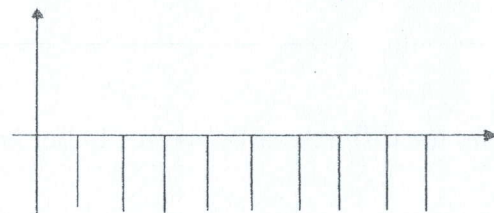
(c) Following sketch is of a sound wave. Indicate (mark) amplitude, wavelength, crest and trough on the diagram.



(d) Sketch on the following two figures two sound waves with (i) double the wavelength and (ii) half the wavelength of the wave given in part (c).



(i) wavelength – double



(ii) wavelength - half

(e) If the frequency and period of the wave in part (c) are  $f$  and  $T$ , respectively, indicate frequencies and periods for the two waves in parts, (d) (i) and (d) (ii).

(i) frequency: ..... period: .....

(ii) frequency: ..... period: .....

8

(f) (i) Indicate three characteristics of a sound wave.

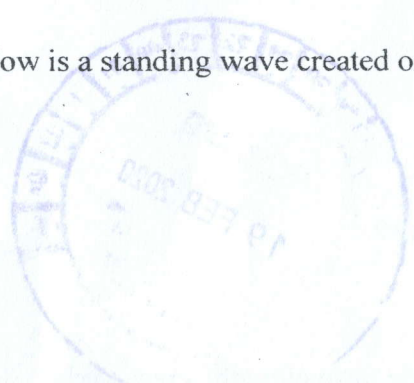
I. ....

II. ....

III. ....

(ii) How does the speed of a sound wave vary with temperature?

(g) How is a standing wave created on a string? Sketch a standing wave.



(a) Define thermal energy of a substance and indicate which physical motions of molecules in the substance contribute to it.

(b) (i) How would you define the two parameters, Heat and Temperature?

(ii) What are the differences between a hotter body and a colder body?

(c) How would you compare cooling times of 1 kg each of water and iron at  $100^{\circ}\text{C}$ ?  
Explain, briefly.

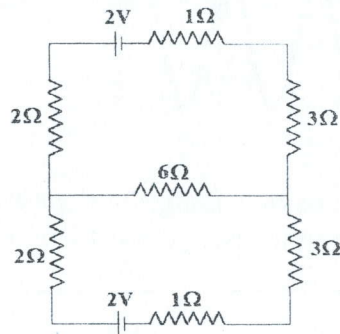
(d) Describe, briefly, each of the three processes of heat transfer.



(e) (i) What is meant by a change of phase of a substance?

(ii) Describe, briefly, the evaporation process.

3. Write down the two Kirchhoff's rules. Find the potential difference across the resistor  $6\Omega$ .



4. Give brief accounts for the following.

(a) State the First Law of thermodynamics, describing each term. Discuss, the two special cases, adiabatic and cyclic processes, briefly.

(b) Discuss the Doppler Effect, briefly, explaining how the frequency of the sounding alarm from a speeding ambulance is heard by a person walking along the street.

(c) Laser action results from stimulated emission of radiation. Explain, briefly.