

**Physics Test**

**(Topics: Magnetism, Sound and Electricity)**

**1.5 hour**

**MM: 40**

- Q1(a)** A sound wave of frequency 500Hz and wavelength 0.66m is travelling in a medium. Calculate the velocity of the wave in the medium. [2]
- (b)** Sound waves A & B are travelling in two different media. Find which wave will be travelling faster, when:
- (i)** A is travelling in water and B is travelling in CO<sub>2</sub>.      **(ii)** A is travelling in CO<sub>2</sub> and B is travelling in hydrogen

Also support your answers with reasons. [2]

**(c)** State the purpose of using the following in an electric circuit.

- (i)** Ammeter      **(ii)** Rheostat [2]

**(d)** A and B are two metal spheres which are connected with the help of a metal wire. State the direction of flow of electrons in each case. [1]



- (e)** The speed of sound in air is 320 ms<sup>-1</sup> and in water it is 1600ms<sup>-1</sup>. It takes 2.5 s for sound to reach a certain distance from the source placed in air.
- (i)** Find this distance. [3]
- (ii)** How much time will it take for sound to travel the same distance when the source is in water? [3]

**Q2 (a) (i)** differentiate between the terms supersonic and ultrasonic. [2]

**(ii)** State two uses of ultrasound.

**(b)** State and explain in detail the three factors on which the speed of sound depends. [3]

**(c)** Refer Fig 1 below show pins suspended from the same magnet to their maximum limit in two different cases. State with a reason whether the set of pins A or the set of pins B are made out of soft iron. Also define the magnetic process which enables us to suspend the pins one below the other. [3]

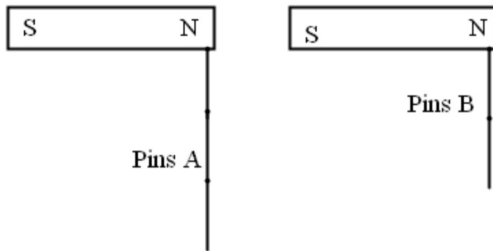


Figure 1

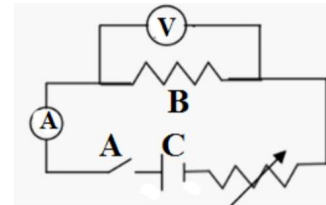


Figure 2

**(d)** Study the Fig 2 above and **(i)** identify the electrical components labelled A, B and C. **(ii)** State whether the circuit given below is open or closed. [2]

**Q3 (a) (i)** Define a secondary cell. **(ii)** Give one example of a secondary cell. **(iii)** State one advantage of a secondary cell over a primary cell. [2]

**(b) (i)** Define a neutral point. **(ii)** In the diagram below AB is a magnet and CD is an iron bar. Study the diagram and determine the polarities at the ends A, B and D. [2]



**(c)** State two differences between an electromagnet and a permanent magnet. [2]

**(d)** Why does a magnet suspended freely from its CG, always come to rest along the north south direction of the earth? [2]

**(e)** How is the frequency of a stretched string related to (i) its length? (ii) Its tension? [2]

**Q4 (a)** Explain in brief any three evidences of earth's magnetic field [2]

**(b)** Write about the ways to increase magnetic field. [1]

**(c)** What is electrical resistance? Explain with figure the cause of resistance and state the factors affecting resistance of conductors. [3]

**(d)** How fuel efficiency in the vehicles can be increased to achieve efficient use of energy? [1]

**(e)** How can you prove experimentally (explain with figure) that sound propagation requires medium? Also state the requisites of the medium [3]