REB

Rwanda Education Board

ADVANCED LEVEL NATIONAL EXAMINATIONS, 2014

SUBJECT: PHYSICS PAPER III

COMBINATIONS:PHYSICS - CHEMISTRY - MATHEMATICS (PCM)

PHYSICS - CHEMISTRY - BIOLOGY (PCB)

MATHEMATICS - PHYSICS - GEOGRAPHY (MPG)

MATHEMATICS - PHYSICS - COMPUTER SCIENCE (MPC)

PHYSICS - ECONOMICS - MATHEMATICS (PEM)

**DURATION : 1hour 30 minutes**

INSTRUCTIONS TO CANDIDATES :

1. Do not open this question paper until you are told to do so.

2. Write your names and index number on the answer booklet as written on your registration form, and **DO NOT** write your names and index number on additional answer sheets of paper if provided.

3. Answer all questions in this paper.

4. You need a pencil, blue or black pen, a 30cm ruler, a mathematical instrument and a calculator

5. All answers must be written in the answer booklet provided.

1. State two ways:
   a) of expressing experimental errors in measurements. (2marks)
   b) of minimizing experimental errors in measurements. (2marks)
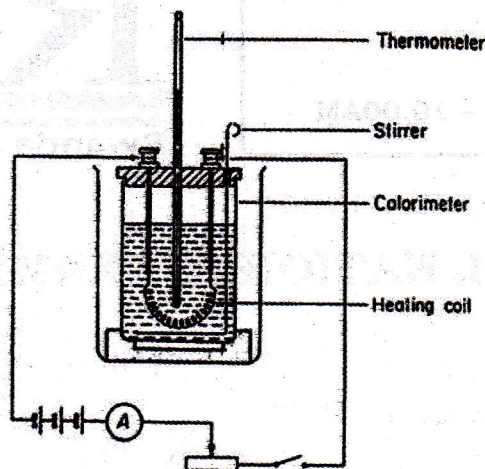
2. In the experiment to determine the rate of change of temperature of water, a 180 watt heater and a thermometer were immersed in 0.5 kg of water in a copper calorimeter as shown in the diagram below.

The following results, showing temperature and corresponding time, were obtained :

Temperature in Celsius degrees: 30   36   40   47   49   55   57

Time in minutes: 3   4   5   6   7   8   9

   a) Write these results in a table using a suitable format. (3marks)

   b) Plot a best fit straight line graph of temperature (along the vertical axis) against time along the horizontal axis. Use the graph paper provided at the back of your answer booklet. (11marks)

   c) From the graph in (b) above find the room temperature of water. (1mark)

   d) i) Using the graph find the slope and show on the graph how you found that slope. (2marks)

      ii) What does this slope represent? (2marks)

   e) Use your results in (d) to find the specific heat capacity of water. (3marks)

   f) Give two reasons why the value you obtained for the specific heat capacity is not the same as the actual value. (2marks)

   g) State two precautions you would take in carrying out this experiment to ensure a more accurate value for the specific heat capacity of water. (2marks)