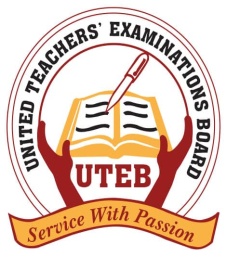
**535/2**

**PHYSICS**

Paper 2

**July / Aug. 2019**

2 hours 15 minutes



**UTEB- JOINT MOCK EXAMINATIONS 2019**

**Uganda Certificate of Education**

PHYSICS

**Paper 2**

2 hours 15 minutes

**INSTRUCTIONS TO CANDIDATES:**

Attempt **five** questions.

Where necessary use the following constants;

Acceleration due to gravity, g = 10 ms-2

Speed of light in air = 3.0 x 108 ms-1

Speed of sound in air = 330 ms-1

Specific heat capacity of water = 4200 Jkg-1k-1

Specific latent heat of vaporization of water = 2.3 x 106 Jkg-1

Specific latent heat of fusion of ice = 3.4 x 105 Jkg-1

**Turn Over**

**SECTION A**

1. (a) State Newton’s first and second laws of motion.  **(02 marks)**

(b) Briefly describe an experiment to determine the coefficient of static friction on a flat horizontal surface. **(04 marks)**

(c) A stone is projected horizontally at 30ms-1 from a point 45 metres above the ground. Calculate;

(i) Time taken to reach the ground.  **(02 marks)**

(ii) Horizontal distance covered. **(02 marks)**

(iii) Vertical speed with which it strikes the ground. **(02 marks)**

(d) (i) Define a watt. **(01 mark)**

(ii) A particle moves at a steady speed of 20ms-1 when a force of 2 x 103N is applied on it. Calculate the power developed.  **(02 marks)**

(iii) State any **two** examples of renewable energy sources. **(01 mark)**

1. (a) Define the terms;
2. Surface tension
3. Capillarity  **(02 marks)**

(b) Briefly describe how a steel needle and bloating paper can be used to show the effect of soap on the surface tension of water. **(05 marks)**

(c) A steel razorblade of weight 0.1N floats on water. Determine the mass of displaced water if the resultant upward force due to surface tension is 0.024N. **(03 marks)**

(d) (i) Briefly describe how concrete can be reinforced.  **(04 marks)**

(ii) Give two ways in which the strength of a material can be altered without any structural change in the material. **(02 marks)**

1. (a) (i) Define the term principal focus as applied to concave mirrors.

**(01 mark)**

(ii) State one use of convex mirrors. **(01 mark)**

(b) A convex lens of focal length 20cm forms an inverted image 5cm tall and 60cm from it. Using a scale diagram find the position and size of the object.

**(05 marks)**

(c) With aid of a labeled diagram, explain how dispersion of white light occurs in

a glass prism. **(05 marks)**

(d) (i) What is observed if a blue dress with red spots is viewed in yellow

light? **(02 marks)**

(ii) Explain your observation in 3(d) (i) above. **(02 marks)**

1. (a) Differentiate between transverse and longitudinal waves. **(02 marks)**

(b) Draw a diagram to show how plane water waves are reflected from a convex reflector in a ripple tank. **(02 marks)**

(c) (i) What is an echo? **(01 mark)**

(ii) Describe briefly how the speed of sound in air may be determined

using the echo method. **(05 marks)**

(d) Explain the importance of reverberation in cinema halls. **(03 marks)**

(e) Determine the first overtone of a closed pipe of length 60cm. **(03 marks)**

1. (a) Distinguish between electromotive force and potential difference. **(02 marks)**

(b) State two limitations of ohm’s law.

(c) With the aid of a circuit diagram, describe how the internal resistance of a cell can be determined. **(05 marks)**

(d) Resistors of 2, 4.5 and 3 are connected as shown below across a battery of emf 1.9V and negligible internal resistance.

1.9V

3

2

4.5

Calculate the;

1. Effective resistance of the circuit. **(03 marks)**
2. Power dissipated by the cell. **(02 marks)**
3. (a) (i) Distinguish between conduction and convection with respect to heat

transfer. **(02 marks)**

(ii) With aid of a labeled diagram, describe how a thermos flask keeps cold liquids cold and hot liquids hot. **(05 marks)**

**Turn Over**

(b) (i) Define the specific heat capacity of a substance. **(01 mark)**

(ii) A copper calorimeter of heat capacity 20JK-1 contains 100g of water at 30oC. If 20g of ice at 0oC is dropped into the water and stirred, calculate the final temperature of the mixture. **(05 marks)**

(c) Explain why ice melts faster when a sportsman skates on it. **(03 marks)**

1. (a) (i) Define the term magnetization. **(01 mark)**

(ii) With the aid of a labeled diagram, describe how a piece of steel can be magnetized using an electrical current. **(04 marks)**

(b) With the aid of a labeled diagram, briefly explain the action of a step up transformer. **(05 marks)**

(c) A 360W, 12V dc device is adapted to use a mains supply of 200V ac. Determine;

(i) The efficiency of the transformer used if the current through the mains supply is 2A. **(03 marks)**

(ii) The number of turns in the primary coil if that in the secondary coil

is 50.  **(02 marks)**

(d) Give two ways of increasing the efficiency of the transformer. **(02 marks)**

1. (a) What are Cathode rays? **(01 mark)**

(b) With reference to a Cathode ray, oscilloscope, describe;

(i) the function of the time – base. **(02 marks)**

(ii) how the brightness of the spot is regulated. **(02 marks)**

(c) With the aid of a labeled;

(i) Diagram, describe how X – rays are produced in an X – ray tube.

**(05 marks)**

(ii) Explain why soft and not hard X-rays are used to take photographs of

internal parts of a patient in hospitals. **(03 marks)**

(d) (i) What is radioactivity?  **(01 mark)**

(ii) Describe the use of radioactivity to locate leakages in underground pipes

**(02 marks)**

**End**