**NAME ……………………………………………………ADM NO…………..DATE………………**

**THEORY**

**FORM 3**

**JULY/AUGUST 2017**

**MWAKICAN JOINT EXAMINATION TEAM(MJET) 2017**

**PHYSICS 232/2**

**PAPER 2**

**FORM THREE**

**2 HOURS**

**Instructions to candidates.**

* **Write your name and admission number in the spaces provided above.**
* **Sign and write the date of examination in the spaces provided above.**
* **This paper contains two sections A and B.**
* **Answer all questions in both sections A and B.**
* **All your answers must be written in the spaces provided below each question.**
* **KNEC Mathematical tables may be used.**
* **Silent ,non-programmed ,electronic calculators may be used where necessary.**
* **All working MUST be clearly shown.**
* **Check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

**For examiners only.**

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| --- | --- | --- | --- |
| **Section**  | **Question**  | **Maximum score** | **Candidates score** |
| **A** | **Q 1- 10** | **25** |  |
| **B** | **11****12****13****14****15****16** | **16****8****9****7****6****9** |  |
| **TOTAL** |  | **80** |

**SECTION A(25MARKS)**

1. Figure 1 below shows a ray of light being reflected from a mirror.

 

What is the angle of reflection? Show your working 1mk

1. State two uses of a charged gold leaf electroscope. 2mks
2. Figure 2 shows a bar of soft iron placed near a magnet.

 

On the same diagram, sketch the magnetic field pattern due to the set up. (1mk)

1. An object is placed 10cm from a concave mirror. A real image of magnification 2 is formed .Calculate the focal length of the mirror. 3mks
2. A girl standing 600m away from a cliff bangs two pieces of wood together and hears an echo 3.5seconds later. Determine the speed of sound in air at that place. 3mks
3. A small object lies at the bottom of a water pond at a depth of 1.2m.Given that the refractive index of water is 1.3,determine the apparent depth of the object. 3mks
4. State three maintenance practices carried out on a lead-acid accumulator. 3mks
5. a)Distinguish between transverse and longitudinal waves.(2mks)

b) Give one example of a transverse wave and one example of longitudinal wave. 2mks

1. A current of 0.5 A flows in a circuit. Determine the quantity of charge that crosses a point in 4 minutes. 3mks
2. The figure 3 shows a soft iron bar AB placed in a coil near a freely suspended magnet.

 

State and explain the observation made when the switch is closed. 2mks

**SECTION B (55 MARKS)**

1. Study the circuit diagram in figure 4 and answer the following questions.

 

1. Calculate the effective resistance between Y and Z. 3mks
2. Determine the current through the 3 Ω resistor. 6mks
3. One of the 6 Ω resistors has a length of 1.0m and cross –section area of 5.0 x 10-6 m2.Calculate the resistivity of the material. 3mks
4. State and explain two factors affecting resistance of a conductor. 4mks
5. Figure 5 shows a displacement time graph for a progressive wave.



1. State the amplitude of the wave. 1mk
2. Determine the frequency of the wave. 4mks
3. Given that the velocity of the wave is 20ms-1, determine its wavelength. 3mks
4. a) Define the term critical angle. 1mk

b) State two conditions for total internal reflection to occur. 2mks

c) Figure 5 show a ray of light incident on a glass – air interface.



Given that the refractive index of the glass is 1.6 .Determine angle $θ$ 3mks

d) Draw a ray diagram to illustrate the dispersion of white light by a triangular glass prism, showing only the red(R) and violet (v) rays. 3mks

1. a) Figure 7 shows a simple electric bell circuit.



1. Name the parts labeled :
2. X 1mk
3. Y 1mk
4. When the switch is closed, the hammer hits the gong. Explain this observation. 2mks
5. How can the rate at which the hammer hits the gong be increased? 1mk

b) State two ways in which the strength of an electromagnet can be increased. 2mks

1. Some plane water waves were produced in a ripple tank. They pass from a region of deep water into a region of shallow water. The figure shows what the waves look like from above.

 

 (a) State what happens at the boundary to.

 (i) The frequency of the waves. (1 mark)

 (ii) The speed of the waves. (1 mark)

 (iii) The wavelength of the waves. (1 mark)

 (b) The waves have a speed of 0.12 m/s in the deep water. Wave crests are 0.08m apart to the deep water. Calculate the frequency of the source producing the waves. (3 marks)

1. a) Distinguish between magnetic and non-magnetic materials. 2mks

b) Figure 8 shows magnetism curves obtained for steel and soft iron materials .



1. With explanations, identify the curve showing the behavior of:
2. Steel 2mks
3. Iron 2mks
4. Which of the above materials can be used in making:
5. Permanent magnet? 1mk
6. Electromagnet? 1mk

c) What is the sure test for magnetism? 1mk