**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM NO: \_\_\_\_\_\_\_\_\_\_\_\_CLASS:\_\_\_\_\_\_\_\_\_\_**

**DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SIGN: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

MARKS HERE

**PHYSICS**

**FORM THREE**

**TERM 3, 2023**

**INSTRUCTIONS: (answer all questions in section A,and choose any two questions from section B TIME: (1hr 30 mins )**

1. Name a property of light that shows it is a transverse wave. (1mk)
2. State THREE differences between light waves and sound waves.(3mk)
3. Explain why radio wave signals are easier to receive than TV waves signals in a place surrounded by hills. (2mk)

1. When a sound wave travels from a dense to a less dense gas, its velocity changes. What wave property does this observation show? Explain your answer. (3mk)
2. The figure below shows a transverse stationary wave along a string.

i) Label the nodes and antinodes. (1mk)

ii) If the distance between an antinode and a node is **0.08m**, determine the wavelength of the wave of the stationary wave (2mk)

iii) State one factor which does not change as water waves move from shallow to deep end (1mk)

iv) What is meant by the term interference as applied to waves. (1mk)

**v)**Explain the meaning of coherent source of wave. (1mk)

**6.** An electric heater is found to have a resistance of **950Ω** when operating normally on a **240V** mains. Find the power rating of the heater. (2mk)

**7.** An electric bulb rated **40W** is operating on **240V** mains. Determine the resistance of its filament (3mk)

**8.** When a current of **2A** flows in a resistor for **10** minutes, **15kJ** of electrical energy is dissipated. Determine the voltage across the resistor.(3mk)

**9.** An electric bulb with a filament of resistance **480Ω** is connected to a **240V** mains supply. Determine the energy dissipated in **2** **minutes**. **(3mk)**

**10.**Two electric heaters A and B rated 1000 W and 2500 W respectively are connected in parallel across a 240 mains supply. Calculate the ratio RA: RB of their resistances. (3mks)

**11.** Two capacitors of capacitance **2µF** and **1µF** are connected in parallel. A p.d of 3V is applied across them. Find the energy stored in the combination. (3mk)

**12.** The fig. shows an arrangement of capacitors connected to a 10v. D.C supply determine:-

**10V**

**3µF**

**3µF**

**2µF**

1. The charge stored in the 2μF capacitor. (2mk)

 ii) The total capacitance of the arrangement. (2mk)

**13.** Figure shows a circuit diagram with three capacitors.

**10V**

**3µF**

**5µF**

**2µF**

(i) Determine the effective capacitance. (3mk)

 (ii) Find the charge on the **3µF**

**14.** A crane lifts a load of **500 kg** through a vertical distance of **2m** in **8 s** determine

1. Work done by the crane (2mk)
2. Power developed by the crane (2mk)
3. Efficiency of the crane given that its operated by all electric motor rated **2kW** (2mk)

b) State two effects which contribute to the efficiency being less than 100% (2mk)