##  GATITU MIXED SECONDARY SCHOOL

## END OF TERM I EXAM NAME:.................................................

## FORM 4 2013 ADM NO:....................

**PHYSICS DATE.....................................**

Instructions: **Answer all questions in this paper. Time: 2 hrs**

1. The figure below **is**  a gas jar completely filled with water and covered with a card

 **card**

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 water

 a) State the observation made when the set up is suddenly inverted (1mk)

 b) Explain the observation in a) above (2mks)

2. A block measures 20cm×10cm× 5cm rests on a flat surface. The block has a weight of 3N. Determine the maximum pressure it exerts on the surface (3mks)

3. The tape in the figure (not to sale ) was obtained from an experiment using a timer of frequency 50Hz

. . . , . . .

 2cm 8cm

 Calculate the acceleration of the body whose motion is represented in the tape (3mks)

4. A bottle of soda always has a space between the cap and the top of the liquid explain (1mk)

5. Distinguish between stable and unstable equilibrium (2mks)

6. Brownian motion is affected by temperature. Explain (1mk)

7. What is polarization as used in simple cells (1mk)

8. Find the resistance of the filament of a lamp rated 250v 60w (3mks)

9. Arrange the following electromagnetic waves in order of increasing wavelength (1mk)

 Ultraviolet, x rays, radio waves, gamma rays

10. What is dispersion of light (1mk)

11. The diagram below shows a bimetallic strip I f put at room temperature

 brass

 brasss

 iron

 Sketch the diagram to show appearance of the bimetallic strip if put below 0$°$c (1mk)

12. Explain why two thin blankets are warmer that one thick one (2mks)

13. Explain why a hole in a ship near the surface is less dangerous than one near the bottom (1mk)

14. Two samples of bromine vapour are allowed to diffuse separately under different conditions , one in a vacuum and the other in air. State with reasons the conditions in which bromine diffuse slower (2mks)

 **Section B (55mks)**

15

1. Give reason why liquids generally expand more than solid (1mk)
2. State three properties of a god thermometric liquid (3mks)
3. State two biological importance of anomalous expansion of water (1mk)
4. Equal masses of water and ice at 10 c are added separately into two identical beaker containing equal amount of water . State a reason why ice may cause a greater change of temperature (1mk)
5. A 180W heater is immersed in a copper calorimeter of mass 100g containing 200g of alcohol. When the heater is switched on after 36sec the temperature of the calorimeter and its contents raises by 12c. What is ht e specific heat capacity of alcohol (specific heat capacity of cu-400j/kg/k ) (4mks)
6. The specific latent heat of vaporization of water is 2.26 ×$10^{6}$J/kg. what does this mean

16 The diagram below shows a circuit in which capacitors are connected

 +

 - 6v

1. Calculate the effective capacitance (2mks)
2. Determine the charge on each capacitor (2mks)
3. Calculate the p.d across the plates of each capacitor (2mks)

17. a) The table bellow shows values of pressure P in the fresh water at different depth

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pressure p (kpa) | 110 | 140 | 180 | 200 | 220 |
| Depth h (m) | 1.0 | 4.0 | 8.0 | 10.0 | 12.2 |

 On the grid provided , plot a graph of pressure (y axis ) against depth (5mks)

18.

1. Define the term refraction of light (1mk)
2. What do you understand by the term internal reflection (2mks)
3. State the conditions necessary for total internal reflection to occur (2mks)
4. Define critical angle (2mks)
5. The figure below shows the path of a ray of light passing through a rectangular block of perplex placed in Air

 Air

 Perplex

 i) Calculate the refractive index of perplex (3mks)

 ii) A ray of light now travels from a transparent medium into perplex as shown in the figure below (transparent material n=2.4

 Calculate the critical angle

 c Transparent material

 Perplex

13 a ) Define

 i) Current and give its SI units (2mks)

 ii)\_ Potential difference and give its SI units (2mks)

 b) State the difference between an ohmic and non ohmic conductor (1mk)

 c) Study the diagram below and answer the questions that follow

6

3

6$Type equation here.$

 i) Calculate the effective resistance of the circuit (2mks)

 ii) Determine the overall current (I) flowing through the circuit (2mks)

 iii) Find the voltmeter reading across the 3 resistors (1mks)

 d) State the factors that affect the resistance of a conductor (3mks)

14. A minibus of mass 1500kg travelling at a constant velocity of 72km/hr collides with a stationary car of mass 900kg. The impact takes 2 seconds before the two move together at a constant velocity for 20 seconds . Calculate

 a) The common Velocity (3mks)

 b) The distance moved after the impact (2mks)