**PHYSICS FORM 4 OPENER EXAM 2015**

**GATITU MIXED SEC SCHOOL**

1. State the effect of decreasing the distance between the plates of a parallel plate capacitor on the capacitance. 1mk
2. State two uses of a charged gold leaf electroscope. 2mks
3. The frequency of an electromagnetic wave is 4.0 ×10 6HZ. Determine its wavelength( take speed of light as 3.0 ×108ms-1) 3mks
4. In a smoke cell experiment, to demonstrate Brownian motion, smoke particles are seen making randomly. State the cause of the randomness. 1mk
5. A light spiral spring extends by 4 mm when loaded with a weight W. The spring is connected in series with an identical spring. The combination is loaded with the weight W. Determine the extension of the combination. 2mks
6. A student measured the length of a wire four times using a metre rule and obtained the following readings; 18.6 cm, 18.5 cm, 18.6 cm and 18.5 cm. determine the length the student should record. 2mks
7. It is observed that when the cap of an uncharged electroscope is irradiated with light of high frequency, the leaf of the electroscope rises. Explain this observation. 3mks
8. The figure below shows a uniform rod 4m long and of mass 2 kg. it is pivoted 1m from one end and balanced horizontally by a string attached near the other end.



Determine the position where a mass of 5 kg should be placed on the rod so that the rod remains horizontal and the tension in the string is zero. 3mks

1. Below is a graph of the variation of temperature with time for a pure substance heated at a constant rate.



Assuming that heat transfer to the surroundings is negligible, state the changes observed on the substance in the region:

1. BC 2MKS
2. DE 2MKS
3. The figure below shows resistors R1 and R2 connected to a battery of potential difference v volts.



1. In terms of V1, R1 and R2 write an expression for,
2. Current I1, through R1 1mk
3. Current I2 through R2 1mk
4. Total current I in the circuit 1mk
5. Show that the total resistance R1 is given by R1 = R1R2/R1 + R2 3mks
6. A long horizontal capillary tube of uniform bore sealed atone end contains dry air trapped by a drop of mercury. The length of the air column is 142 mm at 17 c. determine the length of the air column at 25 c. 3mks
7. The pressure of the air inside a car tyre increases if the car stands out in the sun for sometime on a hot day. Explain the pressure increase in terms of the kinetic theory of gases. 3mks.
8. In an experiment the specific latent heat of vaporization of water, steam of mass 10g at 100c is passed into 100g of water initially at 20 c in container of negligible heat rises to 70 c. (take the specific heat capacity of water as 4.2 ×103jkg-1k-1 and the boiling point of water as 100c)
9. Determine the specific latent heat of vaporization of water. 4mks
10. State two sources of error in this experiment. 2mks
11. The figure below shows a test tube whose cross sectional area is 2 cm2 partially filled with lead shot floating vertically in water.



1. Determine the;
2. Volume of water displaced 2mks’
3. Weight of water displaced. 3mks
4. State the combined weight of the test tube and the lead shot. 1mk
5. determine the length of the test tube that would be submerged in a liquid of density 0.8 g cm3 4mks
6. State how such a hydrometer would be improved to measure small difference in densities of liquids. 1mk