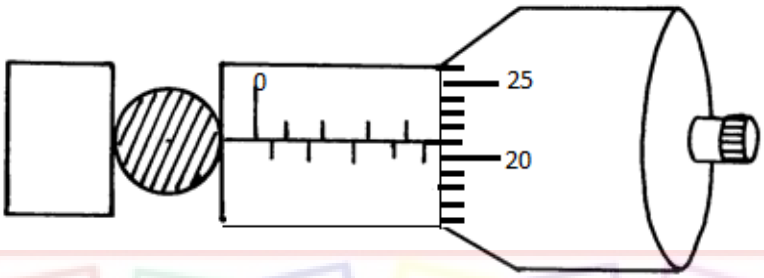
TERM 2 2022 OPENER EXAM FORM 2
PHYSICS FORM THREE

MARKING SCHEME

Time 1hr 45mins

1. A spherical ball bearing of mass 0.0024 kg is held between the anvil and spindle of a micrometer screw gauge. Use this information and the position of the scale in the figure below to answer the questions **(a)** and **(b)** below:



a) What is the diameter of the ball bearing? (1 mk)

4.71mm

b) Find the density of the ball bearing correct to 3 significant figures (3 mks)

2. Explain why it is dangerous for a bus to carry standing passengers. (2 mks)

The position of CoG will be raised making the bus unstable

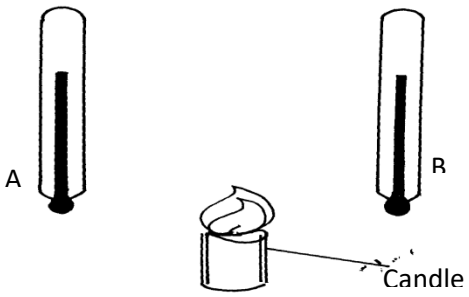
3. Differentiate between cohesive and adhesive forces. (2mks)

Cohesive force is the force of attraction between molecules of the same kind
Adhesive force is the force of attraction between molecules of the differnt kind

Explain the cause of random motion of smoke particles as observed in Brownian motion experiment using a smoke cell. (2mks)

Air molecules are in constant random motion they bombard the smoke particles randomly

4. The Figure 2 shows two identical thermometers. Thermometer **A** has a blackened bulb while thermometer **B** has a silvery bulb. A candle is placed equidistant between the two thermometers



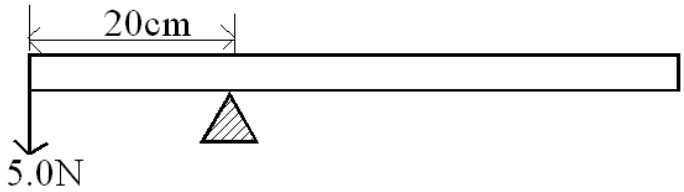
State with a reason the observations made after sometime (2 mks)

Thermometer a will record a high value. Dull surfaces are good absorbers of heat energy

5. Give a reason why water is not suitable as a barometric liquid. (1 mk)

It gives a long measurable column of about 10m

6. A uniform metre rule is balanced as shown below.



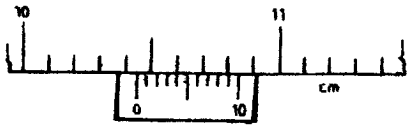
Find the weight of the metre rule (3mrks)

W= 3.333N

7. State the difference between a soft magnetic material and a hard magnetic material.(1 mk)

Soft magnetic materials are materials which are easily magnetized and they don't retain they magnetism for so long.
Hard magnetic materials are materials which are not easily magnetized and they retain they magnetism for so long.

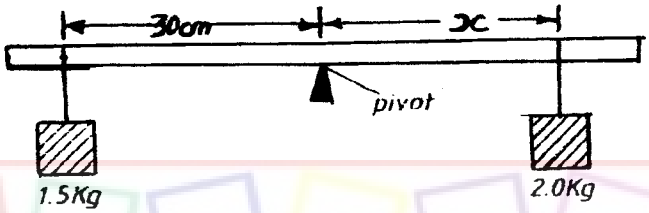
8. The Figure shows a scale of part of a vernier calliper.



What is theactual reading indicated by the scale if the vernier caliper has a zero of +0.02cm. (2mks)

10.44 – 0.02 = 10.42cm

9. A uniform plank of wood is pivoted at its centre. A block of wood of mass 2 kg is balanced by a mass of 1.5 kg placed 30 cm from the pivot as shown in the diagram below. Neglect the mass of the plank



Calculate the distance X. (3mks)

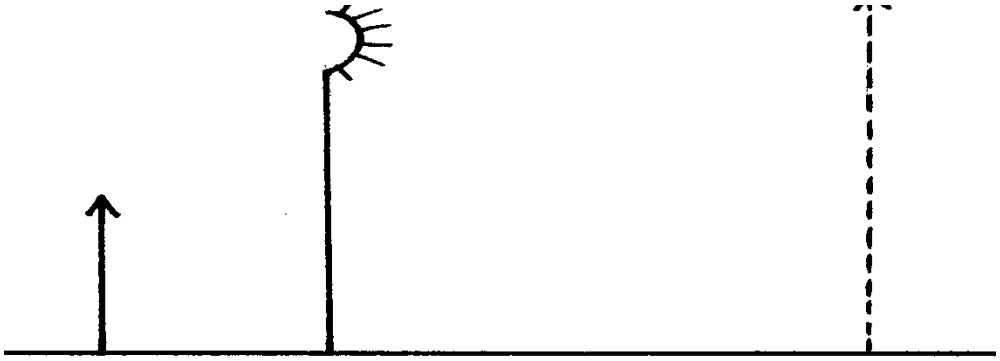
X = 22.5g

10. A highly negative charged rod is gradually brought close to the cap of a positively charged electroscope. It is observed that the leaf collapses initially and the leaf diverges. Explain this observation (2mks)

11. State the right hand grip rule.(2maks)

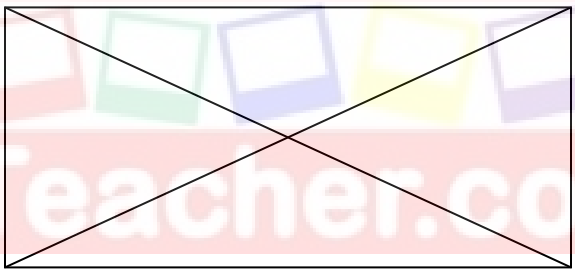
The right hand grip rule states that if a coil carrying a current is grasped in the right hand such that the fingers point in the direction of current in the coil, then the thumb points in the direction of North Pole.

12. The figure below shows an object O and its image I formed by a concave mirror.



Using suitable rays, to locate the focal length of the mirror.
(3mks)

13. The figure **below** shows a uniform rectangular lamina.



Locate and indicate the centre of gravity of lamina. (3mks)

14. Use the information below to answer questions below

In an experiment to determine the density of a liquid, the following readings were made.
Mass of empty density bottle = 20g
Mass of bottle filled with water = 70g
Mass of bottle filled with a liquid = 695g

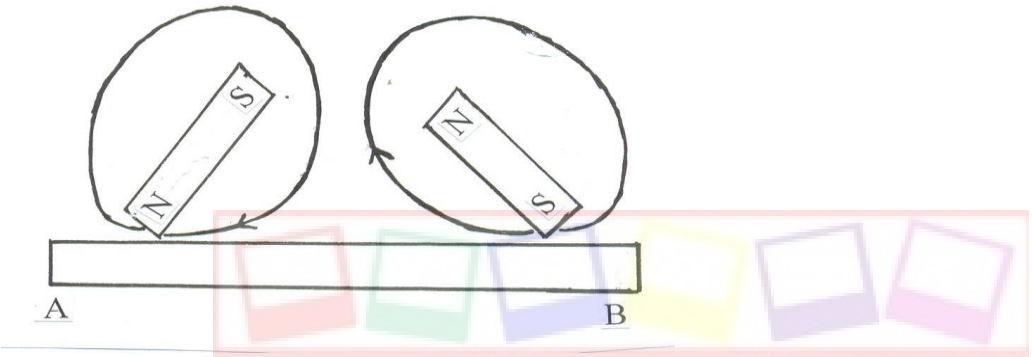
a) Find the density of the liquid, given that density of water is $1000kgm^{-3}$. (4mks)

$13.5g/cm^3$

b) Find the mass of the liquid. (2mks)

675g

15. In an attempt to make a magnet, a student used the double stroke method as shown below.



State the polarities at the ends A and B (2mks)

A South pole **B North pole**

16. An object is placed 30cm in front of a concave mirror of focal length 20cm. Determine

a. Position of the image (3mks)

60cm

b. Magnification (2mks)

2

c. Name two applications of concave mirrors (2mks)

Shaving mirrors
By dentist in examining teeth
In telescopes for astronomical observations
Solar concentrators

17. A metre rule is balanced by masses 18g and 12g suspended from its ends. Find the position of its pivot. (3mks)

18 * x = 12(100-x)
X =40cm mark

18. Explain the function of constriction present in a clinical thermometer. (1mrk)

Prevent backflow of mercury before the nurse record the temperature

19. Define the term moment of force. (2mrks)

Moment of a force is the product of the force (F) and the perpendicular distance from the line of of the force and the point of support

20. State the two laws of reflection (4mks)

The incident ray, the reflected ray and the normal at the point of incidence all lie on the same plane.
The angle of incidence, i, equals the angle of reflection, r.

21. Give that the diameter of an oil drop is 0.15cm and the diameter of a circular patch formed by the same drop on water is 35.35cm.Calculate the thickness of the oil molecule. (4mks)

22. State two differences between mass and weight.(2mks)

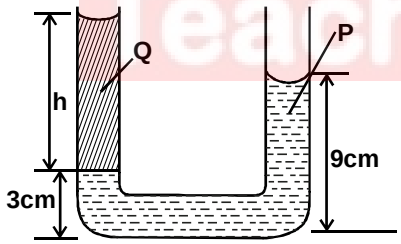
Differences between mass and weight

mass	Weight
1. Its a quantity of matter on a body.	1.It is a pull of gravity on a body .
2. It's measured in kg.	2. It is measured in (N)
3. Same everywhere .	3. Varies from one place to another.
4. Measured using a beam balance.	4.Measured using a spring balance
5.Has magnitude only (scalar quantity)	5.Has both magnitude and direction.(vector quantity)

23. Name two factors that affect stability of a body(2mrks)

The area of the base
The position of the centre of gravity

24. The figure 2, below, U-tube contains two immiscible liquids P and Q. If the density of Q is 900kg/m³ and that of P is 1200kg / m³, Calculate the height of liquid Q. (3 marks)



25. State two defects of a simple cell (2mks)

Polarisation

Local action