GOLDLITE EXAMINATIONS
FORM 4 JUNE 2022 PRE-MOCKS

NAME…… ADM NO ……CLASS……

Candidate's signature……
Date……

232/1

PHYSICS

FORM FOUR

PAPER 1

(THEORY)

2 HOURS

Instructions to candidates

(a) Write your name and Admission number in the spaces provided above.
(b) Sign and write the date of examination in the spaces provided above.
*(c) This paper consist of **two** section **A** and **B.***
*(d) Answer **all** the questions in section **A** and **B** in the spaces provided.*
*(e) All working **must** be clearly shown.*
(f) Mathematical tables and electronic calculators may be used.
(g) This paper consists of 10 printed pages.
(h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

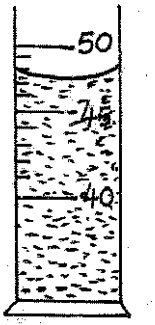
For examiners use only.

Question	*Maximum score*	*Candidate's score*

1-11	*25*	
12-15	*55*	
Total	*80*	

SECTION A (25 MARKS)

1. The figure below shows part of a measuring cylinder containing a certain liquid.

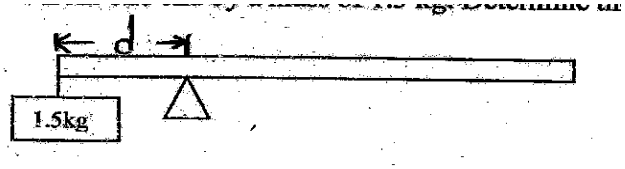


Use this information to answer question 1 and 2
State the accuracy of the measuring cylinder
(1mk)

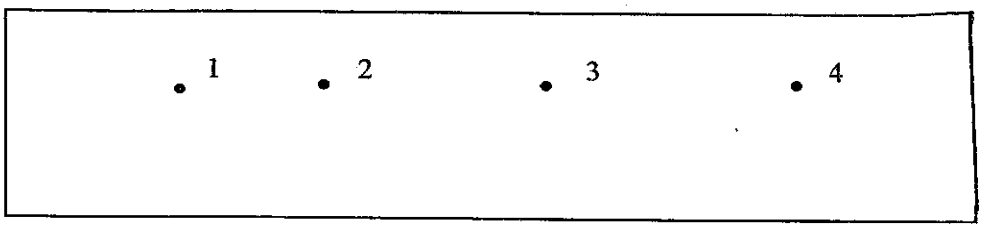
2. What is the volume of the liquid in the measuring cylinder?
(1mk)

3. An oil drop of radius 1mm forms an oil patch of radius 1.33m on a clean water surface. If the oil spreads to make one molecule thick, estimate the size of the oil molecule. (3mks)

4. The figure below shows a uniform wooden plank of length 2m and weight 5N. The plank is balanced at a distance d from one end by a mass of 1.5kg. Determine the distance d. (2mks)



5. Oil is leaking from a car as it travels along a straight road. One drop falls on the ground every two seconds. The figure below shows the pattern of the drop on the ground (the figure is drawn to scale)

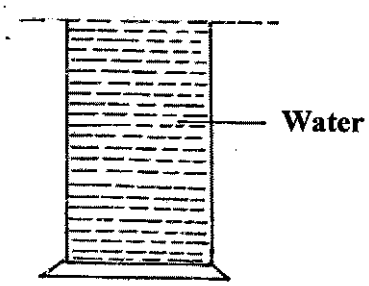


i. Describe the motion of the car.
(1mk)

ii. Determine the acceleration of the car.
(2mks)

6. A ball is thrown from the top of a cliff 20m high with a horizontal velocity of $10ms^{-1}$. Calculate the distance from the foot of the cliff to where the ball strikes the ground.
(2mks)

7. The figure below is a gas jar completely filled with water and covered with a wire gauze.



a) State the observation when the set-up is suddenly invented.
(1mk)

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

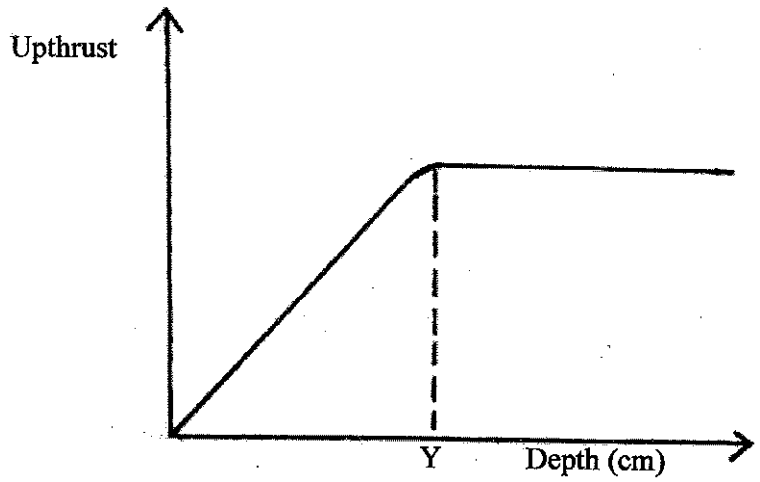
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8. A glass block is suspended from a spring balance and held inside a beaker without touching the beaker. Water is added gradually into the beaker. The figure below shows the variation of the upthrust on the block with depth of water in the beaker.



State the reasons for the observation at Y
(2mks)

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_____

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9. What force is needed to stop a 500kg car moving at 180km/h in 12.5 seconds?
(3mks)

10. A hole of diameter 1.0mm is made in the side of a water pipe. If the pressure of the flow is maintained at $3.0X10^{6}Nm^{-2}$, calculate the force with which the water jets out of the hole. (3mks)

11. Explain why a glass container with thick glass walls is more likely to crack than one with a thin wall when a very hot liquid is poured into them.
(2mks)

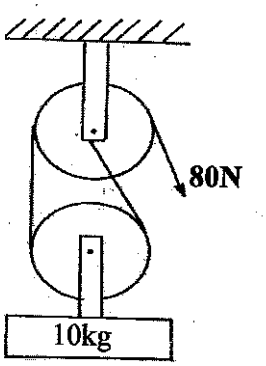
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SECTION B (55 MARKS)

12. (a) Using the pulley system shown a mass of 10kg is raised 2m by an effort of 80N



i. How much potential energy does the load gain.
(2mks)

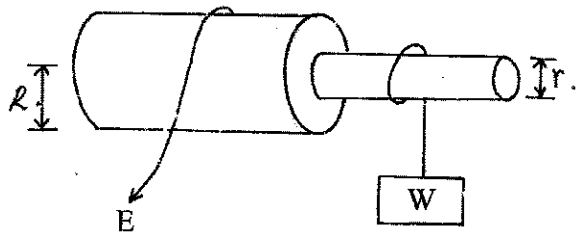
ii. How far does the effort end move in order to raise the load by 2m?
(2mks)

iii. How much work is done by the effort?
(2mks)

iv. What is the efficiency of these pulleys?
(2mks)

v. If all the wasted energy is used to lift the bottom pulley, how much does the pulley weigh?
(2mks)

(b) The figure below shows a wheel and axle being used to raise a load W by applying an effort E. the radius of the large wheel is R and that of small wheel is r as shown



i. Show that the velocity ratio (VR) of this machine is given by $^{R}/_{r}$
ii. Given that r=5cm and R=8cm, determine the effort required to raise a load of 20N if the efficiency of the machine is 80%
(3mks)

13. (a) A litre of gas at a temperature of 0^{0}C and pressure $1.0X10^{5}$ Nm^{-2} is suddenly compressed of half its volume and its temperature rises to 273^{0}C. Calculate the new pressure of the gas
(3mks)

(b) Give two differences between boiling and evaporation
(2mks)

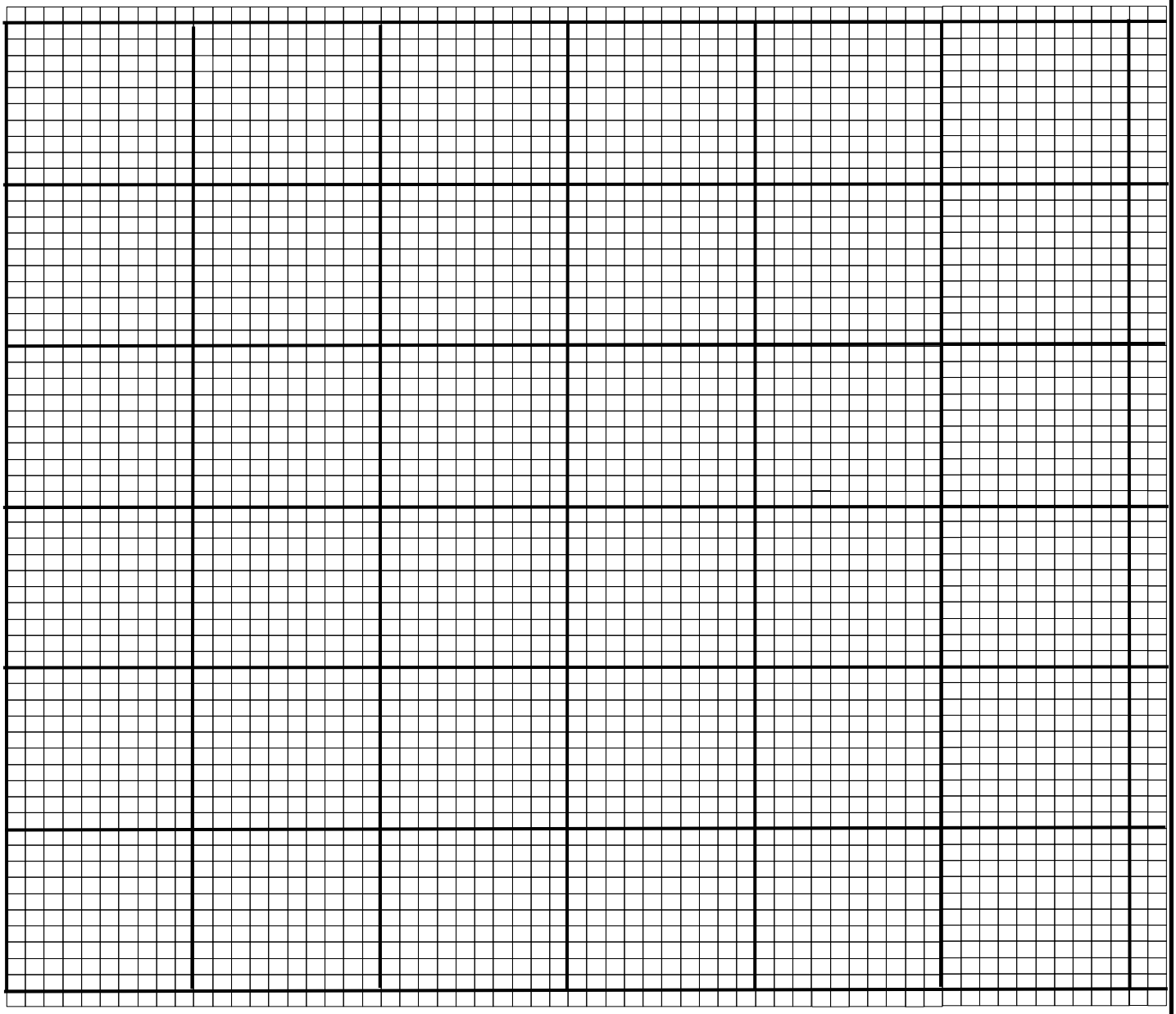
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(c) A 1800 watts heater and a thermometer were immersed in a 1.0kg of a liquid in a copper calorimeter. Temperature was recorded after every one minute. The results obtained are in the table below.

Temperature ^{o}C	30	36	40	45	49	54	57
Time (in min)	3	4	5	6	7	8	9

i. Plot a graph of temperature against time.
(5mks



ii. Use the graph to determine.

I. The room temperature (1mk)

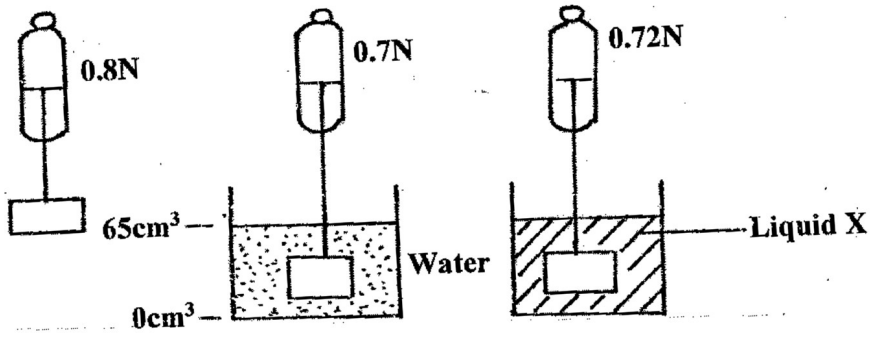
II. The specific heat capacity of the liquid take:
Specific heat capacity of copper = $400Jkg^{-1}k^{-1}$
(4mks)
Mass of copper calorimeter = 100g

14. (i) State the law of floatation
(1mk)

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(ii) A balloon made up of a fabric weighing 80N has a volume of $1X10^7cm^3$. The balloon is filled with hydrogen of density $0.09kgm^{-3}$. Calculate the greatest weight in addition to that of the hydrogen and its fabric which the balloon can carry in air of average density
$1.25kgm^{-3}$ (4mks)

(b) The diagram below shows the same metal block weighted in air, water and liquid X.



(i) Calculate the density of the metal.
(3mks)

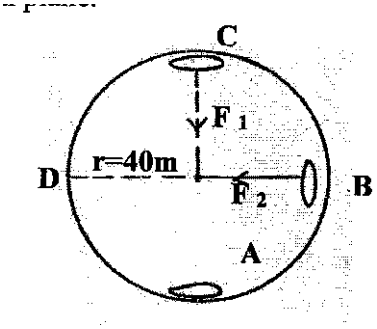
(ii) Water level before the solid was immersed.
(2mks)

(iii) Density of the liquid X (3mks)

15. (a)(i) Differentiate between centripetal and centrifugal forces.
(1mk)

(ii) What provides the centrifugal force needed to make a car travel round in a bend of unbanked road.
(1mk)

(b) Below is a diagram of an aircraft of mass 2000kg together with the pilot performing some air maneuvers in a vertical plane?



If the radius of the circular path is 40m and the aircraft is moving at a velocity of $200ms^{-1}$. Calculate

(i) The external force F_1 provided by the air at point C.
(3mks)

(ii) The external force F_2 provided by the air at point B.
(3mks)