GIDEONS ELITE BOYS CENTRE OF EXCELLENCE
DECEMBER SELF-ASSESSMENT EXAMINATIONS
FORM TWO

PHYSICS

FORM 2 TERM II END-TERM EXAMS

Name …… Adm. No ……

Stream.....

Instructions to candidates

a) *Write your name and admission number in the spaces provided above.*
b) *This paper consists of **two** sections **A** and **B.***
c) *Answer **all** the questions in sections **A** and **B** in the spaces provided.*
d) ***All** working **must** be clearly shown.*
e) *Silent non-programmable electronic calculators may be used.*
f) ***Students should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.***
g) ***Students should answer the questions in English.***

For Examiner's Use Only

Section	Questions	Maximum Score	Candidate's Score
A	1-13	25	
B	14	10	
	15	12	
	16	11	
	17	11	
	18	11	
	Total Score	**80**	

Turn over

SECTION A: (25 marks)

Answer <u>all</u> the questions in this section in the spaces provided.

1. State what is studied under Electricity and Magnetism as a branch of Physics. (1 mark)

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2. Figure 1 below shows two setups by a student using identical lamps and thermometers.

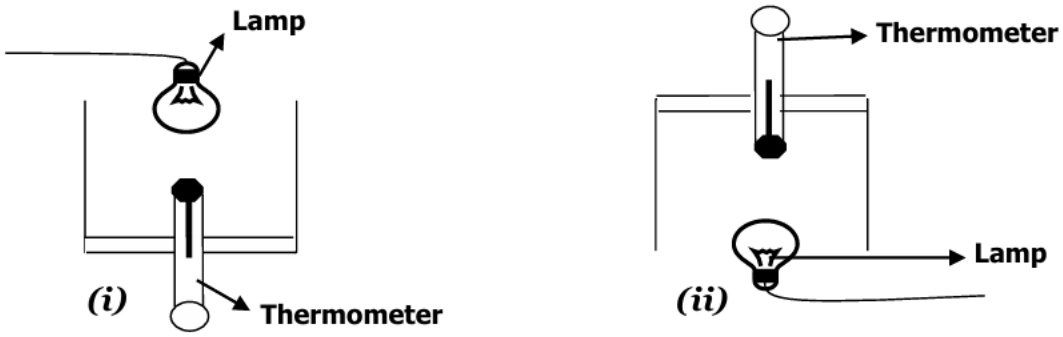

Figure 1

If the lamps are switched on for the same duration, state which setup is thermometer reading a higher temperature? (2 marks)

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3. Differentiate between a fundamental quantity and a derived quantity. (1 mark)

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4 In an experiment to determine the density of certain solid B, the following readings were obtained using a density bottle;
Mass of empty density bottle = 9 g
Mass of the density bottle + some solid B = 99 g
Mass of the density bottle + solid B + water to full =135 g
Mass of the density bottle + Water = 88 g

Calculate the density of solid B. (*Take density of water to be 1g/cm^3*) (4 marks)

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5. State **one** way of making the surface tension of water higher. (1 mark)

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6. A mercury barometer reads 640 mmHg at a raised point and normal pressure of 760 mmHg at the sea level. If the density of mercury is 13.6 g/cm^3 and that of air is 1.3 kg/m^3, determine the altitude of the point. (3 marks)

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7. State **two** conditions that must be met by a horizontal rod acted upon by several forces in order to be at equilibrium. (2 marks)

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8 State the role of lycopodium powder in the Oil Drop Experiment. (1 mark)

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9. In the spaces provided below, sketch two cones resting on a flat illustrating stable equilibrium and unstable equilibrium. (2 marks)

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10. A student added water to capacity into a bottle and then kept it in the refrigerator for a day. He realized that the bottle developed a crack after that duration. Explain. (2 marks)

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11. Explain why heat transfer by radiation is faster than by convection or conduction. (2 marks)

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12. State Coulomb's Law for charges. (1 mark)

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13. **Figure 2** shows an object pin in front of a concave mirror.

Draw a ray diagram to show how the image is formed. (3 marks)

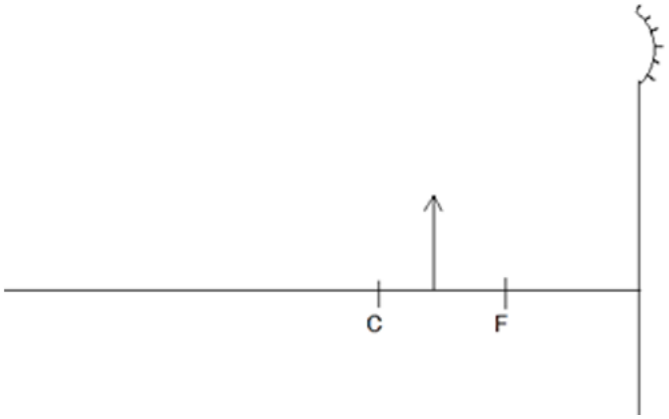

Figure 2

SECTION B: (55 marks)

Answer <u>all</u> the questions in this section in the spaces provided.

14. **(a)** Define the term *'particulate nature of matter'* (1 mark)

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(b) Explain why it is possible to add salt to water without a substantial change in its volume. (2 marks)

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(c) Brownian motion of smoke particles can be studied by using the apparatus shown in **Figure 3.**

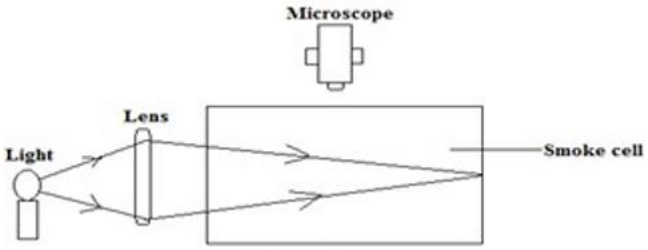

Figure 3

To observe the motion, some smoke is enclosed in the smoke cell and then observed through the microscope. State the role of:

(i) Lens (1 mark)

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(ii) Microscope (1 mark)

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(iii) State and explain the observation made. (3 marks)

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(iv) State and explain what will be observed about the motion of smoke particles if the temperature surrounding the smoke cell is raised slightly. (2 marks)

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15. (a) Define the term *moment of force.* (1 mark)

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(d) State **one** application of antiparallel forces. (1 mark)

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(e) The figure 4 shows a device for closing a steam outlet. The area of the piston is$4.0 \times 10^{-4} m^2$and the pressure of the steam in the boiler is $2.0 \times 10^5\ Nm^{-2}$. Determine the weight W that will just hold the bar in the horizontal position shown. (4mks)

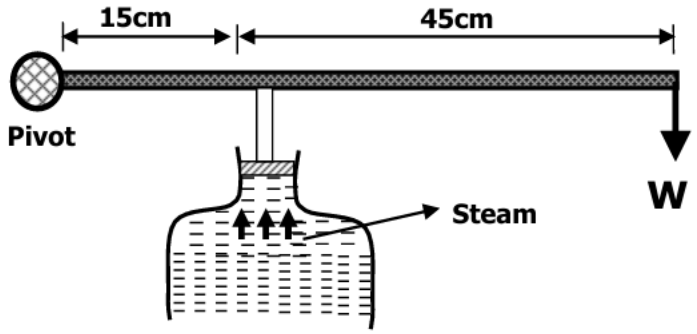

Figure 4

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(f) Explain why car mechanics have a preference for carjacks with long handles. (1 mark)

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(g) A uniform meter rule of mass 150 g is pivoted freely at the 0 cm mark. Determine the force to be applied vertically upwards at the 60 cm mark to maintain the rule horizontal. (3 marks)

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(h) Locate the position of the C.O.G. of the body given. (2 marks)

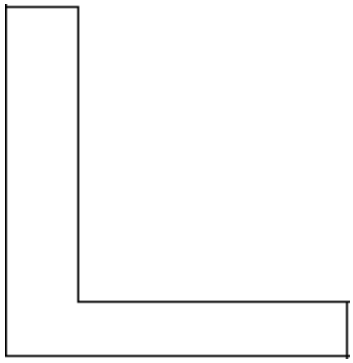

Figure 5

16. (a) Differentiate between magnetic and non-magnetic materials. (1 mark)

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(i) Four bars of metal A, B, C and D are tested for magnetism. B attracts both A and C but not D. D does not attract A, B or C. A and C sometime attract one another and sometimes repel one another. What conclusion can you draw about?

(a) Bar A

(b) Bar B

(c) Bar D (3 marks)

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(j) State the *Motor Rule.* (1 mark)

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(k) Explain how shape of the core affects strength of an electromagnet. (2 marks)

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(l) State **two** uses of a charged electroscope. (2 marks)

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(d) Determine how much charge flows in a circuit if 2 mA current passes in 2.5 minutes. (2 marks)

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17. **(a)** Define the following terms as used in optics; (4 marks)

(i) Paraxial rays.

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(ii) Principal axis of a convex mirror.

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(iii) Pole.

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(iv) Focal length.

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(b) State **one** effect of rectilinear propagation of light. (1 mark)

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The figure 6 below shows an incomplete periscope.

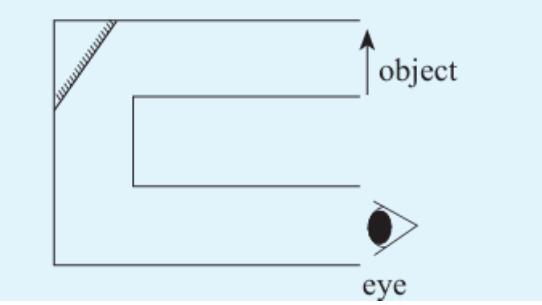

Figure 6

(a) Draw the second mirror. (1 mk)

(b) Complete the diagram to show how the eye views the object. (2 mks)

(c) State and explain the disadvantage of this periscope. (1 mk)

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(d) State and explain an advantage of using glass prisms rather than plane mirrors in a periscope. (1mk)

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(c) State **two** ways the pinhole camera can be modified to take still photographs. (2 marks)

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18. **(a)** A butcher has two masses; 2 kg and 0.5 kg. Explain how he can weigh 1.5 kg of beef at once from a beam balance. (2 marks)

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(b) Figure 7 shows a machine.

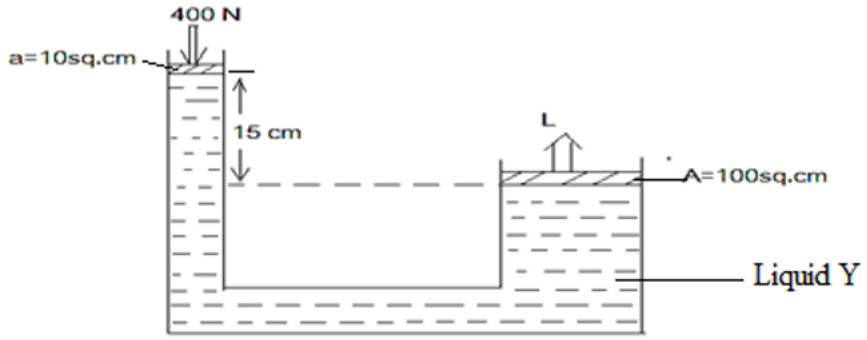

Figure 7

(i) State the name of the machine. (1 mark)

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(ii) Name the principle governing its functioning. (1 mark)

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(iii) Determine the maximum load that can be raised by the machine if the liquid used had a density of 1200 kg/m^3. (3 marks)

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(iv) State **three** properties of liquid Y.

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(v) State an advantage of force pump over lift pump. (1 mark)

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