Kings Academy

SCHOOL OF SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMAT*ICS*

MATHEMATICS DEPARTMENT

END OF TERM 1 2026 EVALUATION

PHYSICS 232/1

NAME :…… ADM NO:……

SCHOOL: ……..Candidate's Signature:……

Examination Date: ……

INSTRUCTIONS TO CANDIDATES

- *Write your name and index number in the spaces provided above*
- *Sign and write the date of the examination in the spaces provided*
- *This paper consists of two sections, A and B.*
- *Answer **all** the questions in the spaces provided*
- *All working must be clearly shown*
- *Non programmable silent electronic calculators and KNEC Mathematical tables **may** be used except where stated otherwise.*
  Take acceleration due to gravity g 10ms^{-2}

Total marks: 80

SECTION 1: 30 marks

1. Figure 1 below shows a burette that was initially filled to 10ml.

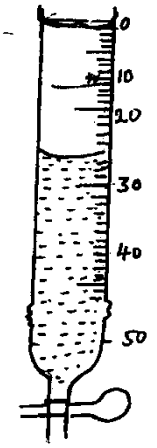


Fig. 1

If the volume of liquid removed from the burette has a mass of 11g, determine the density in ggcm^{-3}. (Leave your answer in 2 decimal places.) (2 mks)

2. An object is placed 16 cm from a converging lens of focal length 12 cm. Find the image distance (3 marks)

3. Figure 2, a & b below shows narrow tubes dipped in mercury and water respectively.

Fig. 2(a)

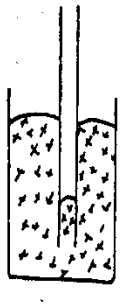
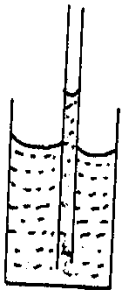


Fig. 2(b)



The temperature of the two liquids in the containers is raised slightly. Indicate the new levels of mercury and water in the tubes respectively and explain your answer. (3 mark)

4. Figure 3 shows three identical tubes containing mercury were inverted as shown.

Use fig. 3 below to answer part a and b.

(a).Indicate on the diagram above the levels of mercury in tube B and C. (1 mk)

b).Explain the effect on the level of mercury in tube A if region X is filled with some air.(2 marks)

5. On the axis below, sketch the variation of density of water with temperature if it is heated from 0^0C to 10^0C. (2 mks)

6. **Figure 3** below shows a laclanche cell.

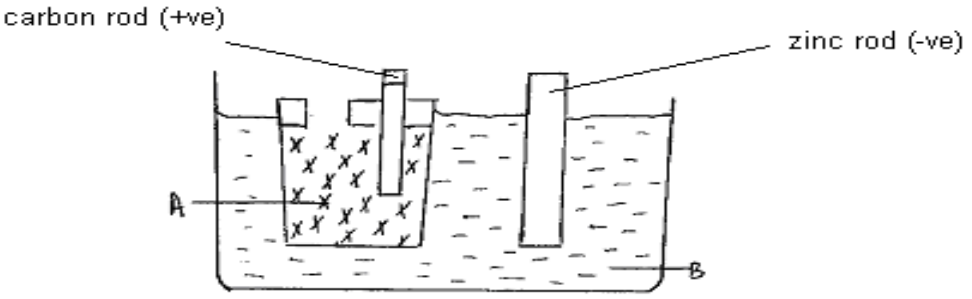


Fig.3

Name the chemical substances in the parts labeled.

A .....

B..... (2 marks)

7. An electric kettle is rated 3KW, 250V. Determine the resistance of the coil. (3mks)

8. The force on a conductor carrying an electric current in a magnetic field can be varied by changing the magnetic field strength and the magnitude of the current. Name two other factors that can affect the force. (2mks)

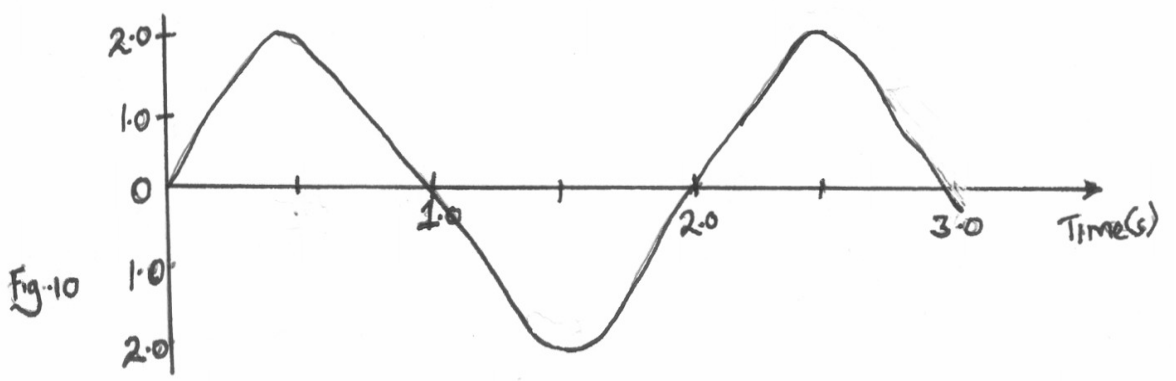
9. Study the circuit shown in fig. 6 below.

Determine the ammeter reading when both switches are closed. (2 mks)

10. **placed 25 cm in front of a convex lens of foal length 20cm. using a scale diagram of 1cm =5cm, draw the ray diagram. (3 marks)**

(b) Use the diagram to determine magnification of the image obtained (2 marks)

11. The Fig. 10 represents an oscillation taking place at a particular point while a sound wave in a gas passes the point. The vertical axis is labeled displacement.



Fig·10

i) Explain what is meant by displacement in this context. (1mk)

ii) From the figure determine

I The period. (1mk)

II. The frequency (1mk)

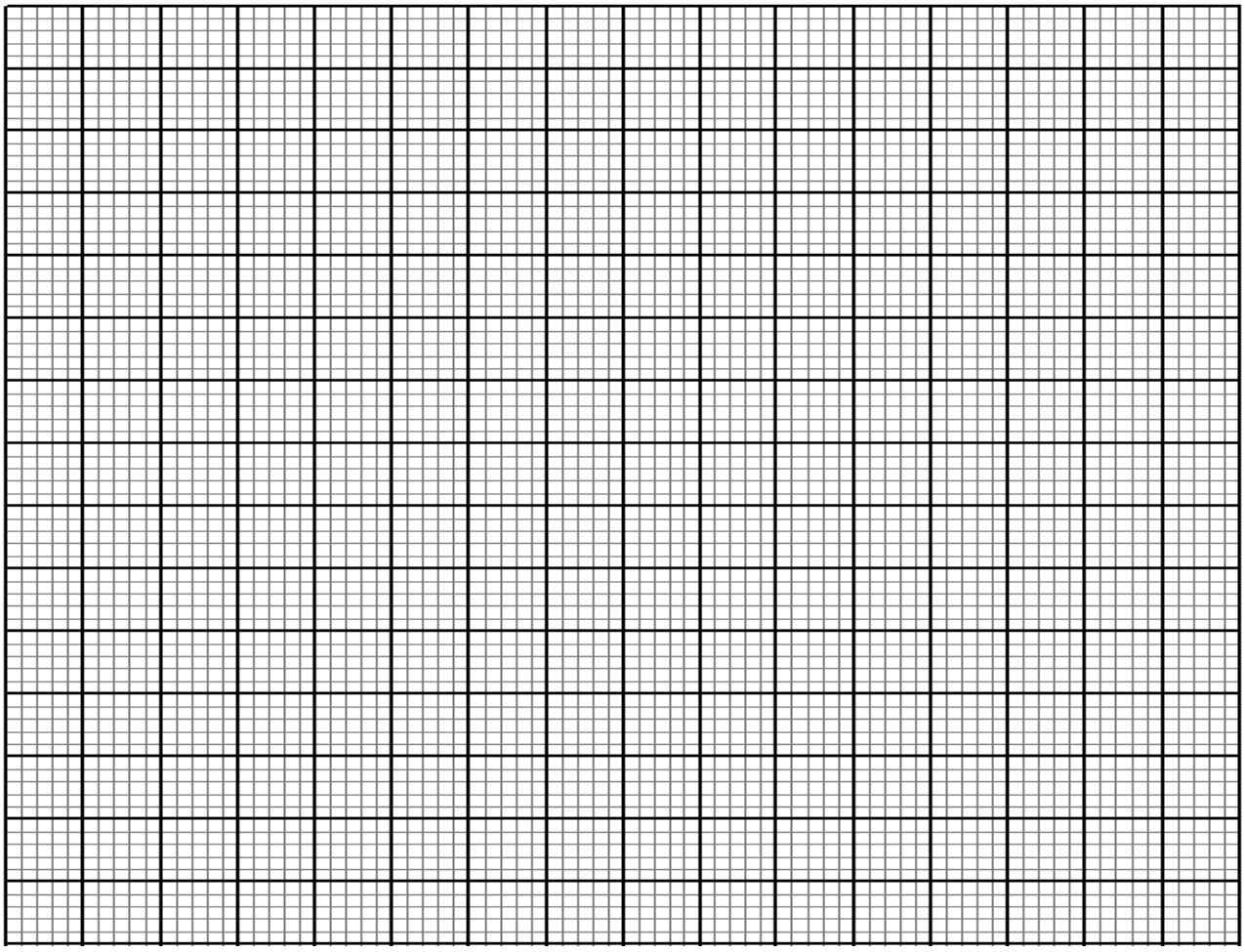
SECTION 11: 50 marks

12. (a) **State** Hooke's Law (1mk)

(b) A student carried out an experiment to investigate the relationship between the force applied and extension produced on a spiral spring. He tabulated his results as shown in the table below.

Force (N)	0	0.8	1.5	3.0	4.5	6.0	7.5
Extension(cm)	0	0.5	1.0	2.0	3.0	4.0	5.0

(i) **Plot** a graph of extension in cm on the Y-axis against force in N (5mks)



From the graph

(ii) **Determine** the spring constant (3mks)

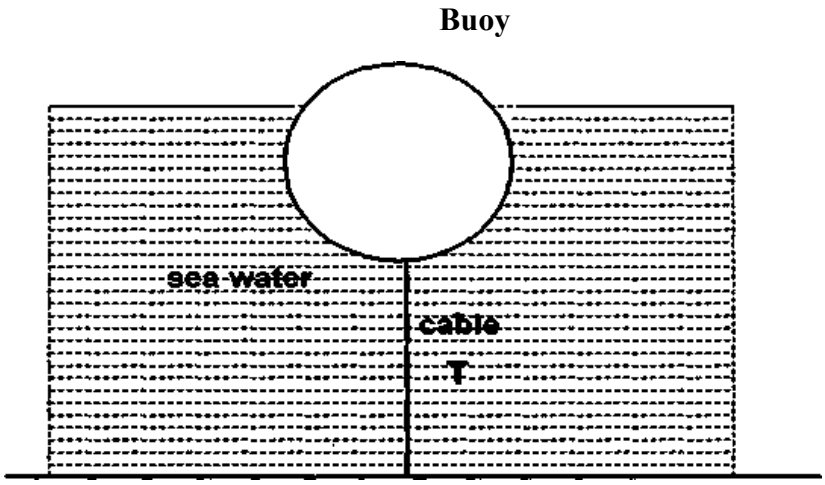
(iii) **What** force would be required to produce an extension of 2.5 cm? (1mk)

(iv) **What** extension is produced by a force of 5.5N? (1mk)

13. **(a) State** Archimedes principle (1mark)

(b) Define the law of floatation (1mk)

(c) Figure 13 shows a buoy, B, of volume 40 litres and mass 10 kg. It is held in position in sea water of density 1.04 g cm-3 by a light cable fixed to the bottom so that 3/4 of the volume of the buoy is below the surface of the sea water. Determine the tension T in the cable. (4 marks)



(b) A sphere suspended from a spring balance in air has its weight recorded as 6N when submerged half-way in water, the spring balance reads 4.2 N. Calculate the volume of the sphere. Take density of water as $1000kgm^{-3}$ (4 marks)

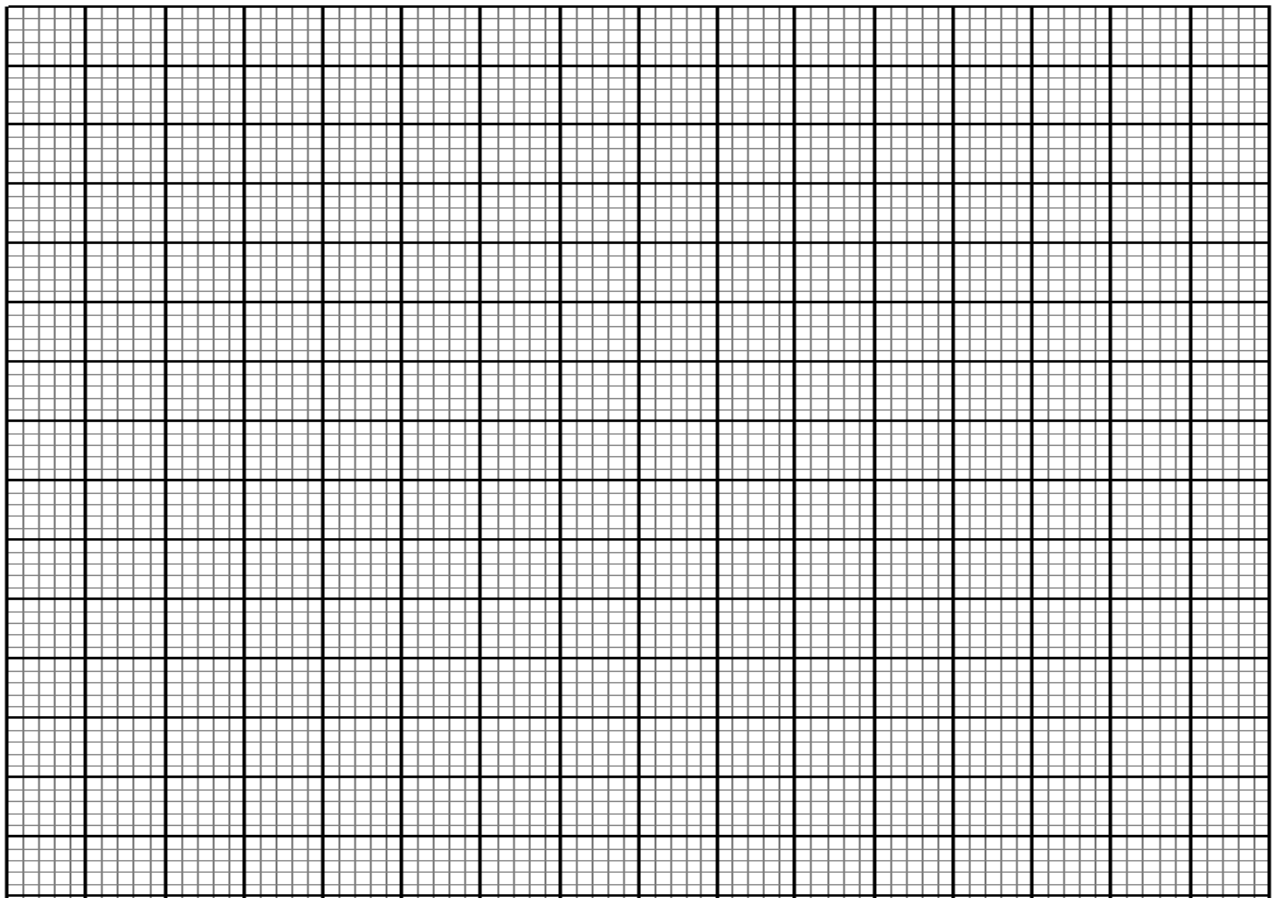
14. **(a) state two applications of convex lens (2 marks)**

(b) A form 4 student did an experiment on thin lenses by varying the object distance and recording the corresponding image distance for the formed by the lense in an attempt to determine the focal length.

Object distance **u** (cm)	Image distance **V (cm)**	UV (cm^2)	(U+V)cm
15	30		
20	20		
25	16.7		
30	15		
40	13.3		
60	12		

(i) Fill in the columns of uv and (u+v) (2 marks)

(ii) On the grid provided, plot the graph of uv against u+v (5 marks)



(iii) Use the graph to determine the focal length of the lens (3 marks)

15. (a) **What** is meant by the term the velocity ratio of a machine? (1mk)

(b) Figure 7 shows a pulley system used to lift a load.

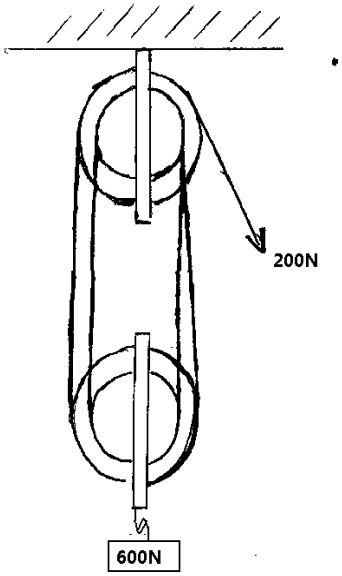


Figure 1

(i) **Determine** the velocity ratio of this machine. (1mk)

(ii) **Calculate** the work done by the effort in lifting the load through 1metre. (3mks)

(iii) **Calculate** the percentage (%) efficiency of the machine. (3mks)

(c) The machine wheel and axle has a lot of application in real life. **Name any two** practical examples of such machine. (2mks)

16. (a)A watchman uses a bow to fire an arrow of mass 0.2kg vertically upwards into the air.

The watchman stretches the bow by 0.15m with a maximum force of 100N. **Calculate** the energy transferred to the arrow. (3mks)

(ii)**Calculate** the speed with which the arrow leaves the bow assuming all energy is transferred to the arrow. (2mks)

(iii) **Determine** the greatest height reached by the arrow before it begins to fall. (3mks)

(iv) **Determine** the time the arrow will remain in the air. (3mk)