THE ELITES JET

232/2 PHYSICS Paper 2

PRE-MOCK

March 2025 – Time: 2 hours

Name …… Adm No……..…….. Class……

School……..…… Date……...…Sign……..…….

Instructions to candidates

a) Write your name and admission number in the spaces provided above.
b) Write your class, the date of examination and sign in the spaces provided above.
c) This paper consists of **two** sections **A** and **B.**
d) Answer **all** the questions in sections **A** and **B** in the spaces provided.
e) **All** working **must** be clearly shown.
f) Silent non-programmable electronic calculators may be used.
g) **This paper consists of 12 printed pages.**
h) **Students should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
i) **Students should answer the questions in English.**

For Exerminer's Use Only

Section	Questions	Maximum Score	Candidate's Score
A	1-13	25	
B	14	11	
	15	12	
	16	09	
	17	12	
	18	11	
	TOTAL	80	

SECTION A (25 marks)

*Answer **all** questions in this section in the spaces provided*

1. State **one** application of optical fibre in medicine. (1 mark)

……

2. When water is poured into a beaker to a depth of 12cm, the bottom of the beaker appears raised by 3cm. Determine the refractive index of water. (2 marks)

……

……

……

……

3. **Figure 1** shows a solenoid carrying current.

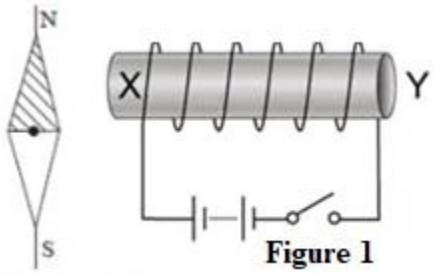

Figure 1

On the diagram, indicate the direction of the compass needle deflection when the switch is closed. Explain your answer. (2 marks)

……

……

4. **(a) Figure 2** shows a permanent magnet placed close to a soft iron. Draw the magnetic field pattern between the two materials. (1 mark)

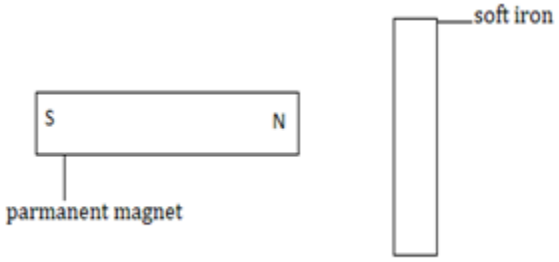

Figure 2

a) During demagnetisation, a magnetised steel rod is placed in East-West direction and hammered repeatedly for some time.

i) Explain how this demagnetises the rod. (1 mark)

……

……

ii) State why it is placed in East-West direction (1 mark)

……

…..……..

……..……..

5. **Figure 3** shows the features of a dry Leclanche' cell.

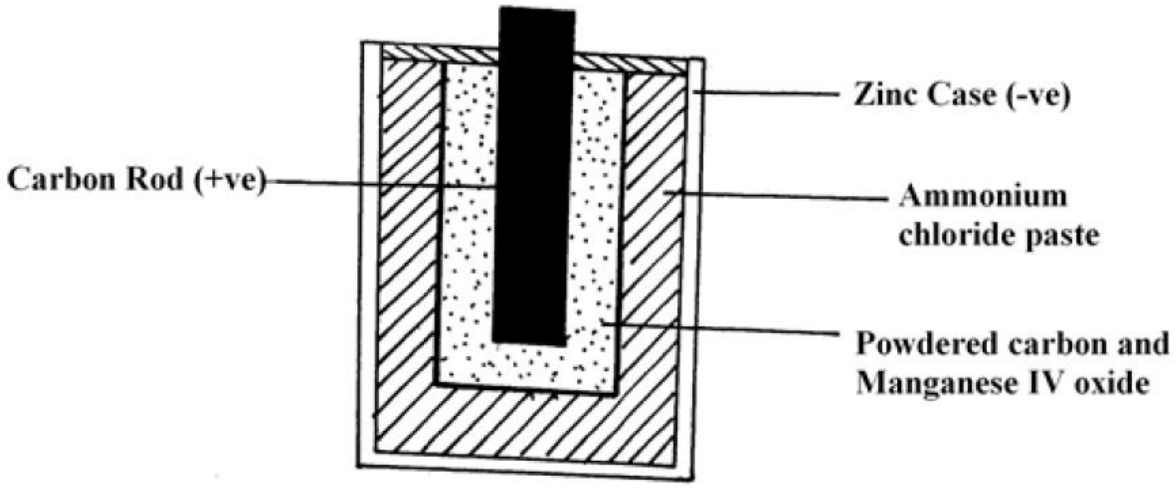

Figure 3

a) State the source of electrical energy for above cell. (1 mark)

……

b) State **one** defect of the cell and how it can be minimized; (2 marks)

Defect……

Minimizing……

6. State **two** disadvantages of a pinhole camera when used to take photographs. (2 marks)

……

……

……

7. **Figure 4** shows a ray of light incident on a glass-medium interface making the angles shown.

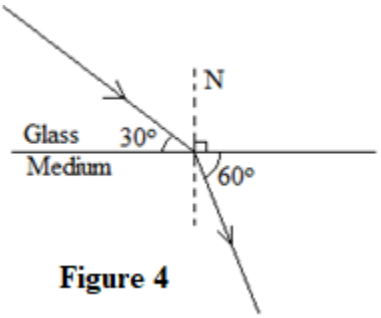

Figure 4

Given that the velocity of light in glass is 2.0×10^8 ms^{-1}, calculate the velocity of light in the medium. ($c = 3.0 \times 10^8$ ms^{-1}) (3 marks)

……

……

……

……

8. Name **one** type of radiation which is used:

(i) in communication in hilly places…….. (1 mark)

(ii) to take photographs at night……. (1 mark)

9. State **two** factors that affect the heating effect of an electric current. (2 marks)

……

……

……

10. Study the diagram in **Figure 5**:

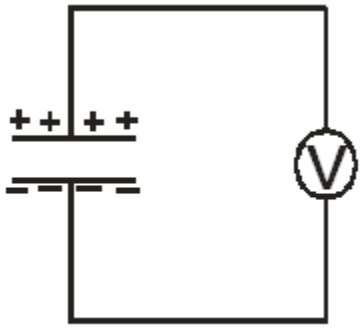

Figure 5

When a thin sheet of mica is inserted between the plates, the voltmeter reading is observed to reduce. Explain this observation. (2 marks)

……

……

……

11. Explain why walls of a studio are padded with soft materials. (2 marks)

……

……

……

12. State **one** use of a fuse in a circuit. (1 mark)

……

……

13. Define the term *echo* as studied under sound. (1 mark)

……

……

SECTION B (55 marks)

*Answer **all** questions in this section in the spaces provided*

14. **(a)** State *Snell's law*. (1 mark)

……

……

……

……

(b) A coin is placed beneath a transparent block of thickness 10cm and refractive index 1.56. Calculate the vertical displacement of the coin. (3 marks)

……

……

……..……..

……..

(c) The speed of green light in a prism is 1.94×10^8m/s.

(i) Determine the refractive index of the prism material.
(Speed of light in air = 3.0×10^8m/s). (2 marks)

……

……

……

……

(ii) Determine the critical angle of the prism material. (2 marks)

……

……..……..

……

……

(d) The refractive indices of water and glass are $^{3}/_{2}$ and $^{4}/_{3}$ respectively. A ray of light incident on a water-glass interface is refracted as shown in **Figure** 6.

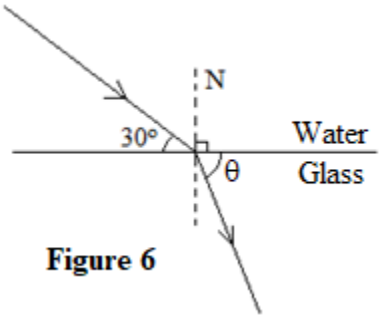

Figure 6

Determine the value θ. (3 marks)

……

……

……

……

15. **a) Figure 7** shows a graph of $\frac{1}{v}$ against $\frac{1}{u}$ for a convex lens, where u and v are the object and image distances respectively.

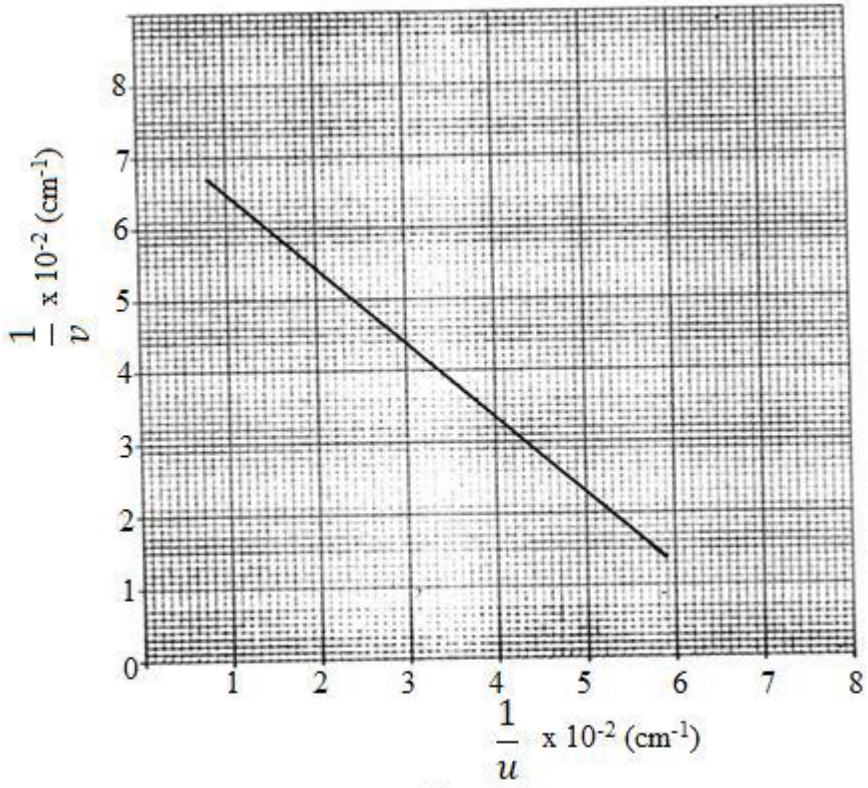

Figure 7

Use the graph to determine the average focal length, f_o, of the lens. (3 marks)

……

……

……

b) Draw a ray diagram to show how a converging lens is used to correct hypermetropia. (3 marks)

……

……

……

……

c) An object is placed 20cm in front of a diverging lens of focal length 10cm. Determine the image distance. (2 marks)

……

……

……

……

d) You are provided with a converging lens of an unknown focal length, a lens holder, a meter rule and a screen. Describe how you would estimate the focal length of the lens in the laboratory. (4 marks)

……

……

……

……

……

……

……

……

……

16. **a) Figure 8** shows circular water waves approaching a concave reflector.

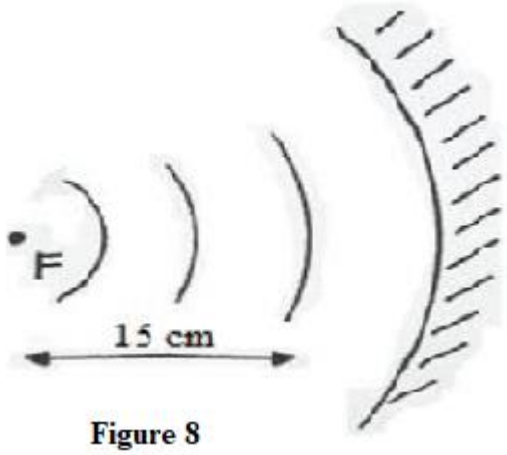

Figure 8

(i) Show the reflected waves in **Figure 8**. (1 mark)

(ii) The wave in **Figure 8** covers 3m after 15s. Determine the frequency of the source of the waves. (2 marks)

……

……

……

b) Figure 9 shows a set up used to demonstrate interference of sound.

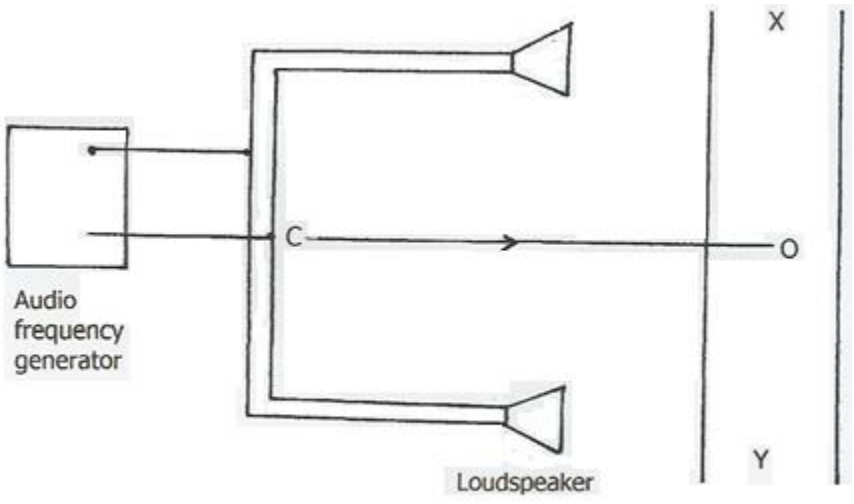

Figure 9

i) State what would be observed if a cathode ray oscilloscope is moved along line XY. (1 mark)

……

ii) The frequency of the audio generator in **Figure 9** is reduced. Explain the difference on the observation on the cathode ray oscilloscope in **(i)**. (2 mark)

……

……

……

c) The graphs in **Figure 10** represent the same wave.

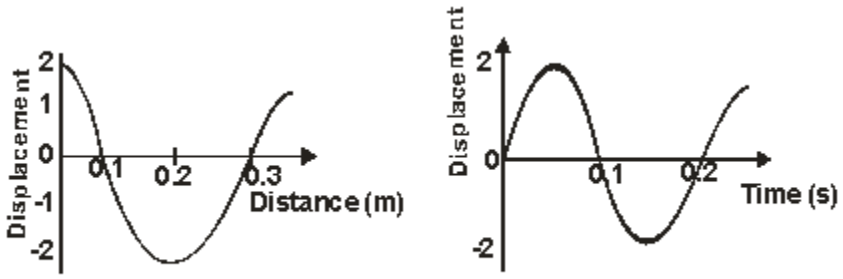

Figure 10

Determine the velocity of the wave. (3 marks)

……

……

……

……

17 **a)** **(I)** **Figure 11** shows a circuit with ammeter reading 1.5A.

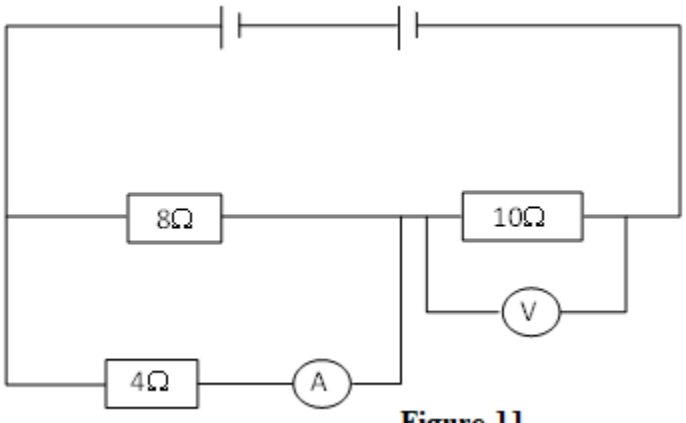

Figure 11

Determine the voltmeter reading. (3 marks)

……

……

……

(II) State the reason for the following in a filament bulb: (2 marks)

(i) air is removed from the bulb.

……

……

(ii) the bulb is filled with an inactive gas.

……

……

b) When the switch is closed in **Figure 12**, the milliameter reads 75mA.

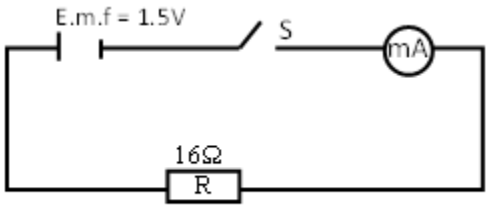

Figure 12

Determine the internal resistance of the cell. (3 marks)

……

……

……

……

c) State *Ohm's law*. (1 mark)

……

……

……

……

d) Three resistors 1Ω, 3Ω and 5Ω are connected together in a circuit. Draw a circuit diagram to show an arrangement that would give minimum resistance and determine the resistance. (3 marks)

……

……

……

18. **(a)** A strong positive charged rod is brought close to the cap of a charged electroscope from a high position. It is observed that the leaf divergence decreases and then increases.

(i) State the charge on the electroscope. (1 mark)

……

……

(ii) Explain this observation (2 marks)

……

……

……

……

……

(b) A parallel–plate capacitor is connected to an electroscope as shown in **Figure 13**.

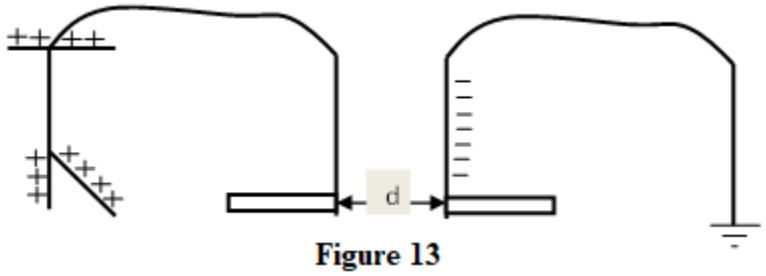

Figure 13

State and explain the behaviour of the leaf when the distance (d) between the plates is increased. (2 marks)

……

……

……

……

(c) **Figure 14** shows an arrangement of capacitors to a 12V d.c. supply.

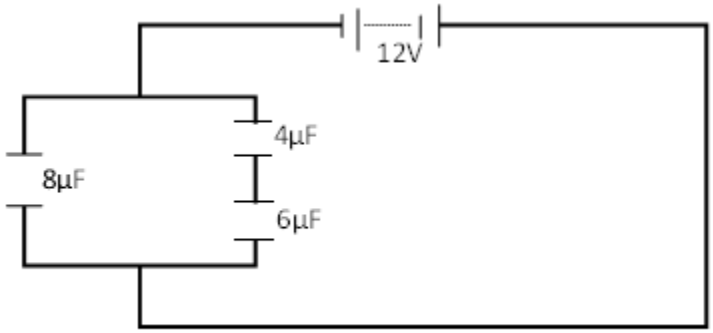

Figure 14

Determine the;

(i) Effective capacitance (3 marks)

……

……

……

……

(ii) Charge across the 8μF capacitor. (2 marks)

……

……

……

……

(d) State **one** use of a gold leaf electroscope. (1 mark)

……

……

THIS IS THE LAST PRINTED PAGE