

Candidate Name

Candidate Number

Centre Name

Centre Number

Paper 1 (2 hours)

**Model Paper
(2 hours)**

It is necessary to respond on the answer sheets provided alongside this question paper. Additionally, you must have a soft pencil (preferably of type B or HB), a clean eraser, and a dark blue or black pen.

INSTRUCTIONS:

- You must write your name, candidate number, centre name, and centre number on the answer sheets in the designated spaces.
- The objective section consists of 25 questions, and you must attempt all of them.
- Each question has four options labelled A, B, C, and D. Select the option that you think is correct. Mark it on the multiple-choice answer sheet using a soft pencil.
- Attempt all the questions from the subjective section using a dark blue or black pen.
- It is important to follow the instructions provided on the answer sheets.
- Do not use correction fluid.
- Avoid writing on any bar codes.
- You are allowed to use a calculator if needed.

INFORMATION:

- This paper has a total of 100 marks.
- In the objective section, there are 25 questions, each carrying one mark. There is no negative marking for incorrect responses.
- Subjective section comprises 75 marks
- The number of marks assigned for every question or its parts is indicated within brackets ().

- Rough work must be completed on this question paper.

Objective Session

Marks:25

1 What is the gravitational field strength at the Earth's surface?

- A. 10 N/kg
- B. 16 N/kg
- C. 50 N/kg
- D. 230 N/k

2. Which voltage is the maximum voltage made when four 1.5 V cells are connected in series?

- A. 0 V
- B. 1.5 V
- C. 3.0 V
- D. 6.0 V

3. An object travelled 800 m in 40 seconds.

Use the equation: distance travelled (m) = speed (m/s) × time (s)

What is the speed of the object?

- A. 0.05 m/s
- B. 20 m/s
- C. 840 m/s
- D. 32 000 m/s

4. In which situation does the force cause a rotation?

- A. Bouncing on a trampoline
- B. Hitting a nail with a hammer
- C. Pushing a friend on a swing
- D. Sitting on a chair

5. Which is a scalar?

- A. Acceleration
- B. Displacement
- C. Force
- D. Speed

6. These statements are about the pressure and volume of a gas.

Which statement is correct?

- A. Volume doubles, pressure doubles
- B. Volume doubles, pressure halves
- C. Volume halves, pressure halves
- D. Volume halves, the pressure stays constant

7. Energy is needed to change ice into water.

Calculate the energy needed to change 5 kg of ice into water.

Use an equation from the datasheet to help you.

Specific latent heat of melting = $3.34 \times 10^5 \text{ J / kg}$.

- A. 16.7 J
- B. 1670 J
- C. 1 670 000 J
- D. 1 670 000 000 J

8. What is this component?



- A. Diode
- B. LED
- C. Lamp

9. _____ is used to smash carcinogenic cells.

- A. Cobat-60
- B. Iodine-131
- C. Uranium-235

10. The ratio of the intensity of magnetization to the magnetization force is known as ____.

- A. Flux density
- B. Relative permeability
- C. Susceptibility
- D. None of the above

11. Which statement about alpha particles is correct?

- A. They are fast-moving electrons.
- B. They are less penetrating than beta particles.
- C. They can pass through lead.
- D. They have less mass than beta particles.

12. Ultraviolet light has a higher frequency than infrared light.

Which of these colours of visible light has the highest frequency?

- A. blue
- B. green
- C. orange
- D. yellow

13. Earth's magnetism is due to:

- A. Dynamo Effect
- B. Doppler Effect
- C. Solar Effect
- D. Magnus Effect

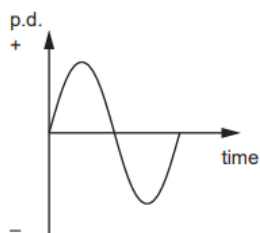
14. What is not correct about ultrasonic waves?

- A. Frequency is very high about 20,000Hz.
- B. Human ears can hear them.
- C. Wavelengths of these waves are very low.
- D. None of the above.

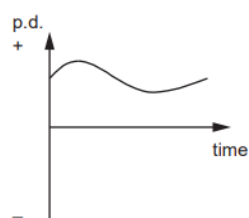
15. Here are some graphs for the potential difference (p.d.) of four electrical supplies.

Which graph shows a direct voltage?

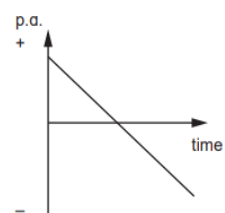
A.



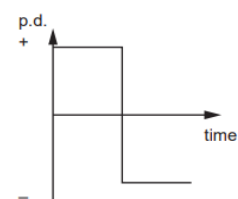
B.



C.



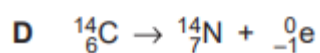
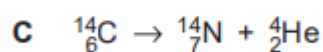
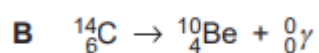
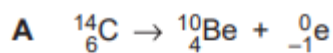
D.



16. Which row in the table is correct?

	Electromagnetic wave	Use
A	Radio	Killing bacteria
B	Microwaves	Mobile phones
C	X-rays	Optical fibres
D	Gamma rays	Tanning beds

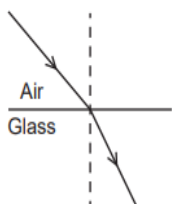
17. Which radioactive decay equation is correct?



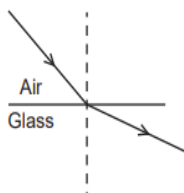
18. A light ray passes from air into glass.

Which diagram shows the refraction of this light ray?

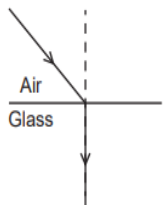
A.



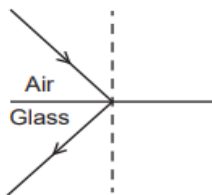
B.



C.



D.



19. Which statement about nuclear fission is correct?

A. An example is when hydrogen is converted to helium.

B. It may happen when a nucleus absorbs a neutron.

C. The Sun uses fission to generate its energy.

D. Two nuclei join to make a heavier nucleus.

20. Which statement is true about the nucleus of an atom?

A. It contains neutrons and ions and has a negative charge.

B. It contains neutrons and ions and has a neutral charge.

C. It contains neutrons and protons and has a neutral charge.

D. It contains neutrons and protons and has a positive charge.

21. A vehicle has an input power from fuel of 20 kW and a useful output power of 6 kW.

Calculate the power it wastes.

A. 3 kW

B. 6 kW

C. 14 kW

D. 20 kW

22. Estimate the typical cruising speed of a jet airliner.

A. 25 m/s

B. 250 m/s

C. 2 500 m/s

D. 25 000 m/s

23. Which of these electromagnetic waves has the highest frequency?

A. microwaves

B. gamma rays

C. ultra-violet rays

D. radio waves

24. The Sun was formed from a cloud of dust and gas. Which force brought together the particles of the cloud?

A. electrostatic

B. frictional

C. gravitational

D. magnetic

25. Why are high voltages used to transfer electrical power from power stations in the National Grid?

- A. allows low-resistance wires to be used.
- B. produces a higher current.
- C. reduces energy losses.
- D. voltage can be changed using transformers.

THEORETICAL PORTION

MARKS:45

1. (i) Calculate the density of mercury if 500 cm³ has a mass of 6.60 kg. Give your answer in g/cm³
1.6 A steel block has a mass of 40 g. It is in the form of a cube. Each edge of the cube is 1.74 cm long.
Calculate the density of the steel. [2]

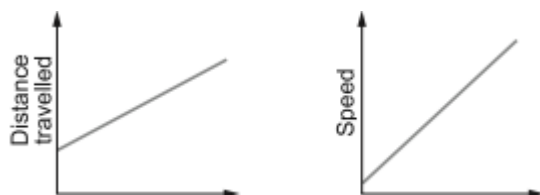
(ii) Here are two graphs that represent the motion of two different objects.

Time A B Distance travelled Time Speed.

a. Copy the distance-time graph. Use your graph to explain how you would find the object's speed.

[2]

b. The object is moving with constant speed. Explain how you can tell this from the graph.



[2]

c. Copy the speed–time graph. Use your graph to explain how you would find the object’s acceleration. [2]

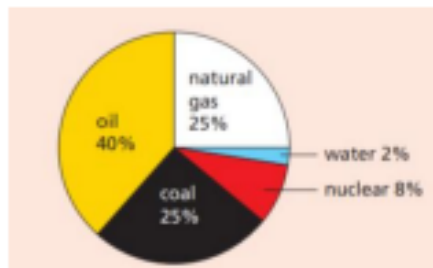
(iii) When an object is in motion, what direction does friction act in? [2]

2. (i) What two conditions must be met if an object is to be in equilibrium? [2]

(ii) What are the 4 types of energy? [2]

(iii) How Does Solar Energy Impact Electricity Costs for Consumers? [2]

3. The pie chart in Fig shows the percentages of the main energy sources used by a certain country.



a. What percentage is supplied by water power? [1]

b. Which of the sources is/are renewable? [1]

c. What is meant by 'renewable'? [1]

d. Name two other renewable sources. [1]

e. Why, if energy is always conserved, is it important to develop renewable sources? [1]

4. (i) Describe and explain an experiment to show Brownian motion. [2]

(ii) Why do we see water droplets on the outside of an ice-cold water-filled glass? [2]

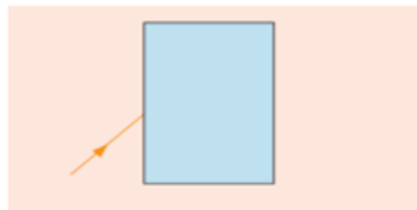
5. (i) The door canopy in a striking way the difference between white and black surfaces when radiation falls on them. Explain why? [2]

(ii) What do you mean by an echo? Which property of sound is affected by the change in temperature? [2]

(iii) State the laws of reflection. [2]

(iv) Give some examples of electromagnetic waves. [2]

6. (i) A ray of light entering a rectangular block of glass.



a. Copy the diagram and draw the normal at the point of entry. [2]

b. Sketch the approximate path of the ray through the block and out of the other side. [2]

(ii) What are the 3 rules of magnetism? [2]

(iii) What is the relationship between charge and field strength? **[2]**

7. How can the total number of neutrons in the nucleus of a given isotope be determined? **[3]**

[30]

[8]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[8]

[illegible]

3. Investigate the Magnetic Field Pattern for a Permanent Bar Magnet and between Two Bar Magnets.[8]

4. Construct electrical circuits to test series circuits using resistors and filament lamps. [6]
