

INTERMEDIATE CERTIFICATE EXAMINATION, 1967

SCIENCE (Syllabus E)

THURSDAY, 15th JUNE - Morning, 10 to 12.30

Not more than six questions to be attempted. Illustrate your answers wherever possible.

1. Give an account of the physical properties of water and of how they change with temperature. Refer in particular to the physical properties in the following cases: (i) below $0^{\circ}\text{C}.$, (ii) at $0^{\circ}\text{C}.$, (iii) at $4^{\circ}\text{C}.$, (iv) at $100^{\circ}\text{C}.$, (v) above $100^{\circ}\text{C}.$ (66 marks)
2. (a) State the law of flotation and describe an experiment to demonstrate it in the case of a liquid other than water.
Draw a sketch of a hydrometer. Describe how the hydrometer may be used to measure the specific gravity of a given liquid.
(b) An object weighs 21 gm. in air, 11 gm. in water and 10 gm. in a given liquid. Find the specific gravity of (i) the object, (ii) the given liquid. (66 marks)
3. State what you understand by the atmosphere. Mention the chief constituents of the atmosphere and give its approximate composition.
Select any two constituents (other than water vapour) and give an account of the principal properties of each of them. (66 marks)
4. Give a brief account of each of the following:
(i) earthquake, (ii) volcano, (iii) glacier, (iv) iceberg. (66 marks)
5. Describe how a thermometer may be graduated to read from $0^{\circ}\text{C}.$ to $100^{\circ}\text{C}.$
Compare and contrast mercury and alcohol as thermometric fluids.
What reading on the centigrade scale corresponds to (i) $23^{\circ}\text{F}.$, (ii) $221^{\circ}\text{F}.$? (66 marks)
6. (a) Show, with the aid of a diagram, how a plane mirror forms an image and describe the kind of image it forms.
How may it be shown that an object and its image are equidistant from a plane mirror?
(b) Draw a diagram to show how a ray of light is refracted on passing through a rectangular block of glass.
State what you understand by the refractive index of a substance. (66 marks)
7. Describe an experiment which shows that sound cannot be transmitted through a vacuum. Describe, with the aid of a labelled diagram, how a note may be produced using a tuning fork. Explain how the note is propagated.
Give a brief account of a laboratory method of measuring the velocity of sound in air. (67 marks)
8. Draw a labelled sketch of (i) a compass, (ii) a dip-circle. State what information about the earth's magnetism at a given place may be obtained from (i) a compass, (ii) a dip-circle.
Give an account of the earth's magnetism. (67 marks)
9. (a) Describe experiments, one in each case, to show (i) the heating effect, (ii) the magnetic effect, (iii) the chemical effect, of an electric current.
(b) Describe, with the aid of a labelled diagram, a direct current dynamo and explain the function of its various parts. (67 marks)
10. Distinguish between conduction and radiation of heat.
Describe a simple experiment to show (i) that copper is a better conductor of heat than iron, (ii) that a blackened surface absorbs heat more readily than a bright surface.
Use a labelled sketch to describe a thermos flask. (67 marks)