ST. BRENDAN'S COLLEGE

GENERAL SCIENCE

Form 1 **Summer, 1963**

Answer FIVE Questions
Essential experimental detail and diagrams should be given whenever appropriate

1. Give a detailed description of how several gas jars of EITHER hydrogen OR carbon dioxide may be prepared in the laboratory. How would you obtain crystals from the liquid left in the flask after preparing hydrogen?

2. Describe, with the aid of a diagram, the essential features of an insect.
   Give a detailed description of the method of feeding of (*a*) the house-fly and (*b*) the cockroach. Why is the house-fly a dangerous pest?

3. Draw a diagram to show the shadows produced when a broad source of light illuminates a sphere. Hence explain with a suitable diagram how a lunar eclipse occurs. What is observed and why during (*a*) a partial and (*b*) a total lunar eclipse?

4. Give a detailed description of how several gas jars of oxygen may be prepared in the laboratory. What exactly is meant by the *combustion* of methylated spirits and what are the products? How would you distinguish between oxygen, carbon dioxide and hydrogen using a splint?

5. Give an account of reproduction in the flower, showing how the bee may assist in pollination. Distinguish carefully between annuals, biennials and perennials. Describe how a bulb prepares its food store in order to survive the winter. State briefly the difference between a bulb and a corm.

6. Show how convection in (*a*) gases and (*b*) liquids may be demonstrated in the laboratory. Describe carefully how land and sea breezes may be explained in terms of this effect. Explain very briefly how isobars on a weather chart may be used to predict wind speed and direction.

7. Draw a large diagram of the human eye. Label clearly and give the function of each of the following;
   (*a*) lens, (*b*) retina, (*c*) iris, (*d*) optic nerve, (*e*) vitreous humour, (*f*) cornea. Contrast this eye with that of the house-fly.

P.T.O.

8. How would you show that different (*a*) metals and (*b*) liquids expand to different extents when subject to the same temperature change? Suggest a possible practical application of (*a*). Explain TWO practical cases in everyday life in which precautions are taken because of the fact that solids expand when heated.

9. How would you obtain (*a*) pure water, (*b*) sand, and (*c*) salt from sea water containing a mixture of these substances? Explain what is meant by the following, giving an example in each case (*a*) solute, (*b*) solvent, (*c*) solution.