

AN ROINN OIDEACHAIS  
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS  
(Secondary Education Branch).

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LEAVING CERTIFICATE EXAMINATION, 1937.

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LOWER COURSE.

PHYSICS.

THURSDAY, 24th JUNE—AFTERNOON, 1 P.M. TO 3 P.M.

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Not more than *six* questions may be attempted  
All questions are of equal value.

1. "Light travels in straight lines." What evidence can you give in support of this statement?

The sun is 800,000 miles in diameter and the earth is 8,000 miles in diameter. If the earth is 93,060,000 miles from the sun, what is the *length* of the umbra of the earth?

2. Write down the laws of reflection of light.

Two plane mirrors are placed at right angles to one another and a pin is placed in the space between them. Draw a diagram to show the positions of the images in the two mirrors, and show the paths of the rays by which an eye sees *one* of the images.

3. Explain, using diagrams, the difference between the *virtual* images which are seen in convex and concave mirrors.

4. On a sunny day, it is possible to set a piece of paper burning using a lens. Explain clearly how this can be done and what type of lens must be used. Draw a diagram showing the positions of the lens and the paper and the direction of the rays of light.

5. Explain clearly how you would find the resultant of two velocities which are not in the same direction.

An airman wishes to fly eastwards. The aeroplane travels at 130 miles per hour and the wind is driving it southwards at the rate of 50 miles per hour. In what direction must he steer and what will be his velocity eastwards?

6. A motor-car of 2,000 lb. mass rolls down an incline of 1-in-4. The brakes exert a retarding force of 400 lb. weight on it. It travels 125 feet before reaching the level road. (a) What velocity has the car when it reaches the level road? (b) How far does it travel along the level road before coming to rest?

7. Explain the terms, "work," "energy," and "power."

A stone of 5 grams mass falls from a height of 100 metres. What kinetic energy has the stone got when it reaches the ground? What happens to this energy when the stone strikes the ground?

8. Explain what is understood by the "angle of declination" and the "angle of dip" of the earth's magnetic field. Give a short account of how the "angle of dip" varies over the surface of the earth.

9. Explain clearly how electricity is obtained by means of an electrophorus. How would you make use of one electrophorus to charge an electroscope (a) positively, (b) negatively.

10. Give an account of the magnetic field (a) near a straight wire, (b) near a circular loop of wire, carrying an electric current. Compare the field near the loop with that near a bar magnet.

11. Give a short account of the conduction of electricity through electrolytes. Describe some ways in which electrolysis is used in modern times.

12. State Ohm's Law.

Find the value of the current which two cells of electro-motive force 1.5 volts per cell and internal resistance 1 ohm per cell would send through a resistance of 0.5 ohm when the two cells are connected (a) in series, (b) in parallel.