Elementary Science.—For Class E. Time allowed: 3 hours.

1. How is force usually measured? Define acceleration. A hoop rolling down hill gains speed: explain why.
2. Upon what do ductility and malleability depend? How would you make a lead wire?
3. How are deep-sea operations conducted? On what principles are the diving-bell and the diving-dress designed?
4. A sounding tuning-fork held over the open end of a lamp-glass partly immersed in water emits the largest volume of sound when the glass is immersed to a certain definite depth. Explain this. What musical instruments depend upon resonance for the pitch of their notes?
5. What are the laws of reflection? Draw a diagram to show how an image is formed in a mirror. How is it that you can see your whole image in a mirror half your height?
6. What form of energy is latent heat? How would you find the latent heat of steam and of water?
7. How would you make a mariner's compass and a dipping-needle?
8. State what will happen when a current is sent through water, sulphate of copper, and chloride of gold, the three solutions being placed in series.
9. Give the names and formulæ of the oxides of nitrogen, and show how you would test for nitrous oxide.
10. Discuss fully the relations existing between plants and animals.

Domestic Economy and Laws of Health.—For Class E. Time allowed: 3 hours.

1. State the disadvantage of lack of cleanliness—first, in cooking utensils; second, in household arrangements. Explain the idea of trapping drains.
2. How would you ventilate a room? State the advantages and disadvantages of an open grate for this purpose. Make a sketch to show the course of the flame through a cooking-range.
3. It is commonly said that colonial people eat too much meat: what are your ideas on the subject? What are your ideas on tea-drinking? Can you give any reason why workmen so commonly take tea with their out-door meals?
4. How would you make a sponge cake? What is the use of beating the eggs so much? Explain fully the use of yeast in cooking.
5. Describe how you would grill a chop, boil a leg of mutton, and make beef tea; and give your reasons for the methods employed.
6. Describe vaccination: explain fully the theory of its action. Diseases are sometimes carried by its means. What would you do, abolish the system or use lymph from the calf?
7. Name the senses and the nerves connected with them, and draw a diagram representing a section of the eye.
8. Contrast the effects of smoking, of drinking, and of the use of opium.
9. What are your ideas as to the effects of cycling regarded as exercise? Describe the kind of costume you consider most suitable for cycling, and give your reasons.
10. It is said that in its many forms consumption is the cause of one-fourth of all the deaths that occur: what do you know of the disease, especially with respect to infection, heredity, and remedial measures?

Elementary Knowledge of Agriculture.—For Class D. Time allowed: 3 hours.

1. Contrast the leaves of monocotyledons and dicotyledons, and state the functional value of the petiole.
2. Describe the flower of the broom, and give an account of the fertilization of the ovule.
3. Describe evaporation. How would you show experimentally that air contains water?
4. What constituents of their food do plants obtain from the soil? How are these constituents taken up by the plant? How would you illustrate endosmose experimentally? What are films of precipitation?
5. Describe experiments to illustrate the chief properties of lime. Describe how you would proceed to apply lime in the caustic condition to the soil.
6. Give the chief compounds of phosphorus employed as manures, and state the especial value of each.
7. What are the chief agricultural compounds of nitrogen? How would you obtain nitric acid from "cubic nitre" (nitrate of soda) and ammonia from "sal ammoniac" (chloride of ammonia)?
8. Describe the changes that take place in the preparation of farm-yard manure. What procedure do you consider best to fix the nitrogen?
9. Describe and explain the importance of crop rotation. Give examples. What modifications would you make for light and heavy soils respectively?
10. What are the chief uses of clay in plant growth? What do you know of the double silicates of aluminium with other elements?