

PHYSIOLOGY AND HYGIENE—FIRST CLASS.

Examiner—J. A. GREIG.

Time—two hours.

1. Where and how is the bile formed? What determines its flow from the gall bladder? What are the purposes served in the animal economy by its secretion?
2. Give the physiological, physical and chemical properties of the blood in the right and the left sides of the heart respectively.
3. Describe generally the structures through which the rays of light pass before they reach the retina, and state what changes they produce in the course of those rays.
What is the most probable mode by which vision is adjusted to near and distant objects?
4. What is the average quantity of air that passes through the lungs per minute! State the composition of the air we breathe, and the changes which it and the blood undergo in their passage through the lungs.
5. Describe the sympathetic nerve system. What is meant by reflex action? Describe minutely the course of the impulse along the nervous system caused by touching the point of the finger with a needle.
6. How do each of the following affect respiration, circulation and digestion, respectively: Alcohol, tobacco, heat, cold, light, sleep, grief and exercise?
7. State the characters, quantities and uses of the secretions of the skin. What effects result from their suppression?
8. Describe the site, dimensions, position of entrance, mode of heating, means of ventilation and arrangement of light for a school on the prairie to accommodate forty pupils. Give reasons for your answer.

CHEMISTRY—FIRST CLASS.

Examiner—A. N. McPHERSON, B.A.

Time—two and a half hours.

1. Explain what is meant by the diffusion of gases? State the law respecting the diffusion of gases. What effect has this quality of gas on the atmosphere?
2. Describe an experiment decomposing water into its two constituent elements. Having collected these elements, how would you distinguish the one from the other.
3. Explain the chemical action which takes place in an ordinary red hot coal fire.
4. Explain the principal of the "Davy" lamp. A candle burns with a luminous flame. Why? Why is the flame non-luminous in the Bunsen burner?
5. Give the characteristics and uses of chlorine gas. Describe its preparation and give the reaction. Upon what property does its bleaching action depend?
6. Give the composition of English gunpowder. Explain the chemical action which takes place when a gun is fired.
7. Explain the cause of the deposition of the crust on the inside of boilers. Why do all waters not deposit it? Can its formation be avoided? If so, how?
8. Write down the formula for copper sulphate. Give some of its uses.
9. How are the various colours imparted to glass?
10. How many grams of nitre and sulphuric acid must I use in order to get 315 grams of pure nitric acid?

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