

9.—GEOGRAPHY AND HISTORY, B.

(Only five questions to be answered.)

1. Draw an outline map of the Persian Empire at the time of Alexander's conquest—naming the adjacent coast waters and locating the cities of Persepolis, Susa, Ecbatana.
2. Write a note on the Persian invasion of Greece.
3. Describe the spread of Christianity in the Roman Empire.
4. Give a sketch of the rise and fall of the Saracenic power in Europe.
5. Mention the chief events in European history during the 16th century.
6. Sketch the rise of Russia as a European power.
7. Trace the events leading to the breaking out of the American Civil War.

10.—PHYSIOLOGY, B.

(Any five questions make a full paper.)

1. Describe the vertebral column generally and the structure of its elements more minutely.
2. Describe generally the position of the muscles by whose contraction the tendons are drawn, (a) those which close the fingers into the palm, and (b) those which straighten the fingers.
3. Discuss the functions of the kidneys.
4. Discuss the source, character and functions of Bile.
5. Describe the position and anatomy of the heart, with a special view to demonstrate to the examiner your experience in the dissection of any animal—your acquaintance with the object rather than with the description of a text book.
6. With a similar purpose describe the lungs of any animal and its connection with the heart.
7. Discuss the spinal nerves and the functions of their different roots.
8. Indicate the position and function of the following: Eustachian tube, the arachnoid, pyramids of Malpighi, the glands of Brunner, the crypts of Lieburkühn, fibrinogen, myosin, the Haversian canals, glenoid fossa, and the deltoid muscle.

11.—PHYSICS, B.

(Any five questions make a full paper.)

1. (a) How can it be demonstrated that air has weight? (b) How would the air in a diving bell be affected by its submersion to a depth, say of 30 or 35 feet in the water?
2. Describe some phenomena which show the existence of surface tension in liquids.
3. Describe the Hydrostatic Press so as to show how the great pressure is obtained from the small force applied.
4. An ounce bullet leaves a gun weighing 8 pounds with a velocity of 1,200 feet per second. (a) What is the maximum velocity of the gun's recoil? (b) When fired vertically how high would the bullet ascend? (c) If fired at an angle of 45°, when would the bullet reach the horizontal plane from which it was fired? (Resistance of the air not to be taken into account)
5. What is the mechanical equivalent of Heat? Indicate briefly how it might be found.

6. Explain the signification of the formula $C = \frac{E}{R+r}$ in electricity, defining the units of measurements involved, and working out as an illustration a concrete example.

7. With what velocity do sound waves travel when a jar whose depth is ten inches gives the maximum re-enforcement for a diapason which makes 256 vibrations in a second?

8. (a) Construct a diagram showing the position of the image of an object placed within the centre of curvature of a concave lense; or (b) Explain by diagram the formation of the image in a compound microscope.