

Here are two physics-related sections from the Sample Admissions Test excerpted as written (including typos) from the 1891 Michigan Mining School Catalogue. In those early days, a Catalogue was a combination of what today we refer to as the Catalog and an annual report.

ELEMENTARY PHYSICS.

1. (1) Upon what property do most of the characteristic properties of matter depend.
(2) Name the three general and five characteristic properties of matter.
2. (1) Name and define the three states of matter.
(2) Give Newton's laws of motion.
3. (1) Define work and energy, give the formula for the calculation of kinetic energy from weight and velocity.
(2) Give the laws of freely falling bodies.
4. (1) How prove that the atmosphere has weight?
(2) What is the object of experiments in the study of physics?
5. (1) Diagram and explain the operation of the hydrostatic press.
(2) Define specific gravity and describe the experiments necessary to determine the specific gravity of an irregular solid. If the specific gravity of copper is 8.9, what is the volume, in cubic centimeters of a mass of this metal which weights 3.2 pounds?
6. (1) What is the mechanical equivalent of heat? To what is the heat of a body due? Do the atoms or the molecules of a body set either themselves or one another in motion?
(2) Give your idea of force. What is sound? What are the properties of a musical note? Diagram and explain the phonograph and the telephone.
7. (1) Explain the ways in which heat may be transmitted. Give some of its principal sources and effects. Change -40°F. to C. Upon what does the boiling point depend?
(2) Define light. What constitutes the difference between light and heat? Between the different colors? What is the velocity of light? Of sound in the air, at the temperature 0°C ?
8. (1) Give the laws of magnets. Give the laws of currents of electricity. Explain Ampère's theory of the magnet. How may magnets be made?
(2) Describe the experiments and the results obtained by the use of a galvanometer, a primary coil, a secondary coil, a battery and a magnet. Tabulate the results.
9. (1) Give Ohm's law. Define ohm, volt, ampère. Draw diagrams showing how to connect cells in series and in arc or abreast. If a Bunsen cell as an electromotive force of 1.8 volts and internal resistance of .9 ohm, show how to connect ten such cells to get the greatest current, the external resistance being 100 ohms?
(2) Give some of the principal uses of electric currents. Explain

how such currents are produced by a dynamo?

10. (1) What constitutes the difference between the operation of a dynamo and that of an electro-motor?

(2) In charging a storage battery, what is stored up in it? What is meant by “the conservation of energy?”

ASTRONOMY.

1 What is the general structure of the Solar System, and what is the physical constitution of the sun and its surroundings?

2. What is the physical constitution and special characteristics of the inner group of planets, including the moon?

3. What are the physical constitution and characteristics of the outer group of planets?

4. What are the aspects, forms and physical constitution of the comets, meteors and shooting stars.

5. What are nebulæ; new, variable and double stars, and upon what evidences are the views concerning them based?

6. How are stars located in the heavens? What are declination, right ascension, hour angle, latitude, longitude? and what are the six parts of the Polar triangle?

7. Describe the four kinds of time giving the maximum variations between them. How is the longitude of a place determined?

8. What is the general structure of the universe?

9. State clearly the Nebular Hypothesis, and give the evidence upon which it is based?

10. Give the general phenomena of the tides, their causes and laws.