

*Elementary Biology.—For Class D, and for Senior and Junior Civil Service.
Time allowed: 3 hours.*

[Candidates are requested to answer questions in one subject only.]

ANIMAL PHYSIOLOGY.

1. Describe the general form and structure of the vertebral column, and show how they are related to its functions. Describe in detail the characters of some one vertebra.
2. Give an account of the structure and various functions of the skin. Describe as far as you can the microscopic appearance of a section of skin.
3. When the diaphragm of a rabbit is exposed and an opening made in it on one side, the lung of that side may be seen to collapse immediately. Why does it do so, and what light does this throw on the manner in which respiration is effected?
4. What are the characters of glandular tissue? Mention the chief glands of the body, and state their functions.
5. Describe the course of the circulation of the blood. What are the functions of the blood-corpuses?
6. Describe the chief kinds of connective tissue in the body. Compare their properties, and give examples of their distribution in various parts of the body according to the function of the part.
7. Describe the structure of the spinal cord and the arrangement of the spinal nerves.
8. What are the general physiological properties of nerve? What is reflex action? Describe experiments which illustrate your answer.

BOTANY.

1. What are the functions of roots, and by what characters are they distinguished? Describe the chief kinds of roots.
2. Explain how plants obtain their carbon. What parts of the plant are concerned in the process, and what is their structure? Describe experiments which illustrate your answer. Mention some of the chief carbon compounds in the plant.
3. What is a fibro-vascular bundle, and of what tissue-elements is it composed? Explain how a dicotyledon increases in length and thickness.
4. How is water absorbed by the plant? Give an account of the movements of water in the plant.
5. What is a fruit, and how does it differ from a seed? In what plants is the part popularly recognised as the seed really a fruit? Distinguish between true and spurious fruits, and give examples.
6. Explain in what way it is advantageous for plants to have some means of distributing their seed, and describe some of the chief modifications to insure the dispersal of seeds.
7. Describe the usual structure of a stamen. Mention the natural orders known to you in which the number and arrangement of the stamens are characteristic.
8. Explain the following terms, and name plants which illustrate them: Perigynous, adnate, capitulum, spadix, glume, apocarpous, bract, umbel, monœcious.

Shorthand—Senior.—For Senior Civil Service. Time allowed: 3 hours.

INSTRUCTION TO SUPERVISORS.

1. Inform candidates before the time for taking up this subject that they may use pen or pencil as they please for taking notes, which should be written on ruled paper, but that they must transcribe those notes into longhand with pen and ink.
2. Inform candidates that when once you have commenced to dictate you cannot stop until the passage is finished.
3. Dictate the passages at the following rates of speed:—
 - (a.) 80 words per minute.
 - (b.) 120 " "
 - (c.) 150 " "

N.B.—It will be well to practise reading these aloud some time beforehand, looking at a watch or clock, so as to accustom yourself to reading at the exact rate indicated.*

4. Candidates are at liberty to take down one, two, or three passages, as they choose. All the passages required by candidates are to be dictated before any one begins to transcribe; and there should be as little delay as possible between readings.
5. Inform candidates that rapidity in transcribing notes into longhand is essential, and note carefully on the transcribed copy the exact time taken in transcription. Candidates must not look at their notes while a passage that does not concern them is being read.
6. Inform them also that the clearness and accuracy of the shorthand notes (which must in every case be sent in attached to the transcript) will be taken account of by the examiner; and that they must not alter the shorthand notes after the dictation is finished.

* The matter to be read is marked off into sections, each of which is to occupy a minute. The Supervisor will perhaps find it advisable to mark it off into smaller sections, each containing the number of words to be read in fifteen seconds, and to read one section every quarter of a minute. As the candidates hear the passage read only once, the reader's articulation ought to be very clear, and the candidates ought to be so placed as to be able to hear well.