Questions 40-50

Radiocarbon dating and tree-ring dating, in combination, have provided a very powerful tool to establish a time spectrum for more recent dates in the past. The initial idea for dating by tree rings can be traced back to 1811. Modern scientific tree-ring dating, dendrochronology, stems from pioneering work in early 1900's.

Usually, but not always, trees produce one ring each year. This ring is formed by the cambium, which lies between the old wood and the bark. In spring, wood cells with large lumens are manufactured, but in summer and autumn, the cells become smaller and more thick-walled until with the onset of winter the production of a new cell stops. The same process is repeated the following year. In this way a year's growth (annual ring) is imprinted as new wood. The demarcation line between summer and autumn wood of the previous year, with its characteristic small cells, and the spring wood of the year following, with its large cells, enables annual rings to be counted relatively easily.

Growth rings, however, are not always the same thickness. They vary for several reasons. Environmental factors rigidly control the degree of growth of an annual ring or determine whether, in fact, an annual ring appears at all in any particular year. Thus in a specific locale or, more accurately, a specific climatic province, tree-ring counts will reflect climatic conditions and variations due to inequalities of climate from year to year. In years with abnormal drought, for example, narrow rings are produced and sometimes no ring at all. In this way a fossil record is imprinted for as long as the wood remains intact. From this pattern a historical template can be constructed to correlate one set of growth rings in one tree with a set of growth rings in another tree or piece of timber.

Another important factor is that tree-ring growth varies with age of the tree. As the tree matures, the rings become narrower, and this results in the central rings being wider than those on the outer part of the tree.

40. What does the passage mainly discuss?
(A) The effect of drought on tree-ring growth
(B) The history of dating trees
(C) The problems of tree-ring dating
(D) The formation of growth rings in trees

41. The word "stems" in line 4 is closest in meaning to
(A) distinguishes
(B) recovers
(C) derives
(D) returns

42. The approximate age of a tree can be determined by
(A) counting the rings
(B) analyzing the structure of the cells
(C) examining the cambium
(D) measuring the width of the rings

43. The word "onset" in line 9 is closest in meaning to
(A) beginning
(B) coldness
(C) difficulty
(D) darkness

44. The word "enables" in line 14 is closest in meaning to
(A) combines
(B) forces
(C) encourages
(D) allows

45. The word "They" in line 15 refers to
(A) large cells
(B) growth rings
(C) several reasons
(D) environmental factors

46. According to the passage, the production of rings from year to year in any given tree is
(A) random
(B) predetermined
(C) variable
(D) accelerated

47. The word "reflect" in line 19 is closest in meaning to
(A) indicate
(B) affect
(C) confuse
(D) limit

48. A narrow growth ring between two wide growth rings would probably indicate
(A) an unusually warm winter
(B) the death of an old tree
(C) unfavorable climatic conditions during a single year
(D) wood cells that had grown to be very large

49. Which of the following terms is defined in the passage?
(A) dendrochronology (line 4)
(B) lumens (line 8)
(C) drought (line 20)
(D) template (line 23)

50. The phrase "this pattern" in line 22 refers to

(A) the change of seasons
(B) different climates in different places
(C) the destruction of trees and forests
(D) variation in the thickness of tree rings

This is the end of Section 3.

If you finish in less than 55 minutes, check your work on Section 3 only. Do NOT read or work on any other section of the test.

When you are ready to check your answers, use the answer key on page 94 of this booklet to determine which questions you answered correctly and incorrectly.