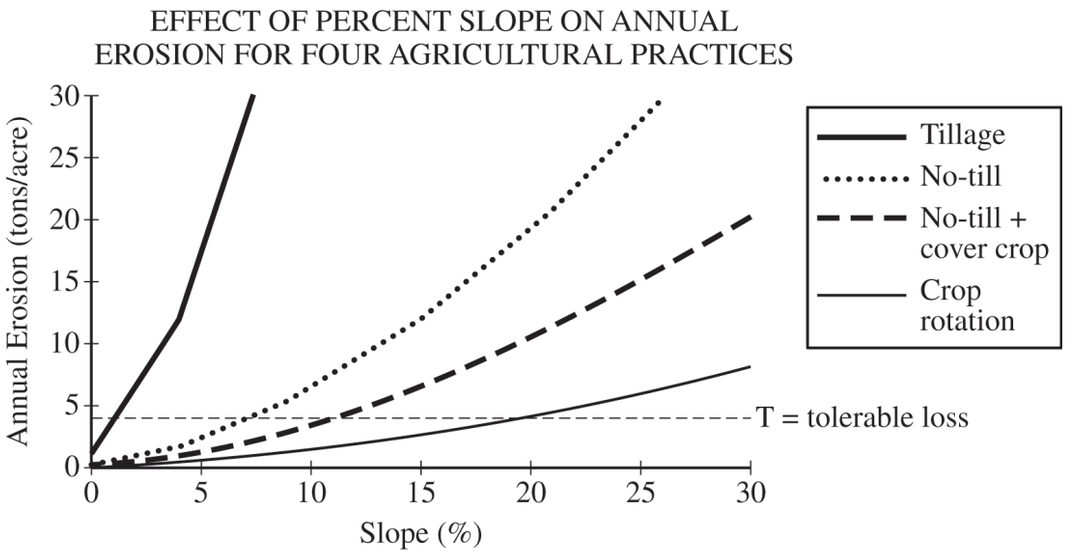
ENVIRONMENTAL SCIENCE

SECTION II

Time—1 hour and 10 minutes

3 Questions

Directions: Answer all three questions, which are weighted equally; the suggested time is about 22 minutes for answering each question. Write all your answers in the Free Response booklet. Where calculations are required, clearly show how you arrived at your answer. Where explanation or discussion is required, support your answers with relevant information and/or specific examples. You may plan your answers in this orange booklet, but no credit will be given for anything written in this booklet. **You will only earn credit for what you write in the separate Free Response booklet.**



1. Soil erosion is one of the most serious soil-degrading processes. Each year tons of soil erode from cropland, pastures, forests, and other places. The amount of erosion varies dramatically among various land-use types. The figure above shows the effects of different agricultural practices and slopes on annual erosion rates.

(a) Refer to the graph above for the following.

(i) **Identify** the scientific question that resulted in the data presented in the graph.

(ii) **Identify** the agricultural practice that could be used on a 15% slope without leading to a higher than tolerable loss of soil.

(iii) **Describe** the effect of adding a cover crop compared to using the no-till method.

(iv) **Identify** one natural mechanism of soil erosion.

(i) **Identify** the dependent variable stated in the hypothesis.

(ii) **Describe** one way to add a control to improve the design of the study.

(iv) Based on the data in the table above, **make a claim** about the stated hypothesis.

(c) Several fish species lay their eggs in the gravel in the streams under investigation in the study.

(i) **Describe** the type of survivorship curve expected for these fish species.

(ii) **Explain** why the input of sediment to a stream can negatively affect reproduction of fish that lay their eggs in the gravel of the streambed.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.