



## Section Two: Reading Skills:

### I. Read the passage and answer the questions that follow: (Passage 1)

Line Each advance in microscopic technique has provided scientists with new perspective,  
(5) on the function of living organisms and the nature of matter itself. The invention of the visible-light microscope late in the sixteenth century introduced a previously unknown realm of single-celled plants and animals. In the twentieth century, electron microscopes have provided direct views of viruses and minuscule surface structures. Now another type of microscope, one that utilizes X rays rather than light or electrons, offers a different way of examining tiny details; it should extend human perception still farther into the natural world.

(10) The dream of building an X-ray microscope dates to 1895; its development, however, was virtually halted in the 1940's because the development of the electron microscope was progressing rapidly. During the 1940's electron microscopes routinely achieved resolution better than that possible with a visible-light microscope, while the performance of X-ray microscopes resisted improvement. In recent years, however, interest in X-ray microscopes has revived, largely because of advances such as the  
(15) development of new sources of X-ray illumination. As a result, the brightness available today is millions of times that of X-ray tubes, which, for most of the century, were the only available sources of soft X rays.

The new X-ray microscopes considerably improve on the resolution provided by optical microscopes. They can also be used to map the distribution of certain chemical  
(20) elements. Some can form pictures in extremely short times; others hold the promise of special capabilities such as three-dimensional imaging. Unlike conventional electron microscopy, X-ray microscopy enables specimens to be kept in air and in water, which means that biological samples can be studied under conditions similar to their natural state. The illumination used, so-called soft X rays in the wavelength range of twenty to  
(25) forty angstroms (an angstrom is one ten-billionth of a meter), is also sufficiently penetrating to image intact biological cells in many cases. Because of the wavelength of the X rays used, soft X-ray microscopes will never match the highest resolution possible with electron microscopes. Rather, their special properties will make possible investigations that will complement those performed with light- and electron-based instruments.

1. What does the passage mainly discuss?
  - (A) The detail seen through a microscope
  - (B) Sources of illumination for microscope
  - (C) A new kind of microscope
  - (D) Outdated microscopic techniques
2. The word "enables" in line 22 is closest in meaning to
  - (A) constitutes
  - (B) specifies
  - (C) expands
  - (D) allows
3. The word "minuscule" in line 5 is closest in meaning to
  - (A) circular
  - (B) dangerous
  - (C) complex
  - (D) tiny
4. The word "Rather" in line 28 is closest in meaning to
  - (A) significantly
  - (B) preferably
  - (C) somewhat
  - (D) instead
5. The word "those" in line 29 refers to
  - (A) properties
  - (B) investigations
  - (C) microscopes
  - (D) X rays
6. The word "it" in line 7 refers to
  - (A) a type of microscope
  - (B) human perception
  - (C) the natural world
  - (D) light

7. Why does the author mention the visible-light microscope in the first paragraph?
  - (A) To begin a discussion of sixteenth-century discoveries
  - (B) To put the X-ray microscope in a historical perspective
  - (C) To show how limited its uses are
  - (D) To explain how it functioned
9. According to the passage, the invention of the visible-light microscope allowed scientists to
  - (A) see viruses directly
  - (B) develop the electron microscope later on
  - (C) understand more about the distribution of the chemical elements
  - (D) discover single-celled plants and animals they had never seen before
8. Why did it take so long to develop the X-ray microscope?
  - (A) Funds for research were insufficient.
  - (B) The source of illumination was not bright enough until recently.
  - (C) Materials used to manufacture X-ray tubes were difficult to obtain.
  - (D) X-ray microscopes were too complicated to operate.
10. Based on the information in the passage, what can be inferred about X-ray microscopes in the future?
  - (A) They will probably replace electron microscopes altogether.
  - (B) They will eventually be much cheaper to produce than they are now.
  - (C) They will provide information not available from other kinds of microscopes.
  - (D) They will eventually change the illumination range that they now use.

## II. Read the passage and answer the questions that follow: (Passage 2)

- People appear to be born to compute. The numerical skills of children develop so early and so inexorably that it is easy to imagine an internal clock of mathematical maturity guiding their growth. Not long after learning to walk and talk, they can set the table with impressive accuracy—one plate, one knife, one spoon, one fork, for each of the five chairs. Soon they are
- (5) capable of noting that they have placed five knives, spoons, and forks on the table and, a bit later, that this amounts to fifteen pieces of silverware. Having thus mastered addition, they move on to subtraction. It seems almost reasonable to expect that if a child were secluded on a desert island at birth and retrieved seven years later, he or she could enter a second-grade mathematics class without any serious problems of intellectual adjustment.
- (10) Of course, the truth is not so simple. In the twentieth century, the work of cognitive psychologists illuminated the subtle forms of daily learning on which intellectual progress depends. Children were observed as they slowly grasped—or, as the case might be, bumped into—concepts that adults take for granted, as they refused, for instance, to concede that quantity is unchanged as water pours from a short stout glass into a tall thin one. Psychologists have since demonstrated
- (15) that young children, asked to count the pencils in a pile, readily report the number of blue or red pencils but must be coaxed into finding the total. Such studies have suggested that the rudiments of mathematics are mastered gradually and with effort. They have also suggested that the very concept of abstract numbers—the idea of a oneness, a twoness, a threeness that applies to any class of objects and is a prerequisite for doing anything more mathematically
- (20) demanding than setting a table—is itself far from innate.

- 11 . What does the passage mainly discuss?
- (A) Trends in teaching mathematics to children
  - (B) The use of mathematics in child psychology
  - (C) The development of mathematical ability in children
  - (D) The fundamental concepts of mathematics that children must learn
- 12 . It can be inferred from the passage that children normally learn simple counting
- (A) soon after they learn to talk
  - (B) by looking at the clock
  - (C) when they begin to be mathematically mature
  - (D) after they reach second grade in school
- 13 . The word "illuminated" in line 11 is closest in meaning to
- (A) illustrated
  - (B) accepted
  - (C) clarified
  - (D) lighted
- 14 . The author implies that most small children believe that the quantity of water changes when it is transferred to a container of a different
- (A) color
  - (B) quality
  - (C) weight
  - (D) shape
- 15 . According to the passage, when small children were asked to count a pile of red and blue pencils they
- (A) counted the number of pencils of each color
  - (B) guessed at the total number of pencils
  - (C) counted only the pencils of their favorite color
  - (D) subtracted the number of red pencils from the number of blue pencils
- 16 . The word "They" in line 17 refers to
- (A) mathematicians
  - (B) children
  - (C) pencils
  - (D) studies
- 17 . The word "prerequisite" in line 19 is closest in meaning to
- (A) reason
  - (B) theory
  - (C) requirement
  - (D) technique
- 18 . The word "itself" in line 20 refers to
- (A) the total
  - (B) the concept of abstract numbers
  - (C) any class of objects
  - (D) setting a table
- 19 . With which of the following statements would the author be LEAST likely to agree?
- (A) Children naturally and easily learn mathematics.
  - (B) Children learn to add before they learn to subtract.
  - (C) Most people follow the same pattern of mathematical development.
  - (D) Mathematical development is subtle and gradual.
- 20 . Where in the passage does the author give an example of a hypothetical experiment?
- (A) Lines 3–6
  - (B) Lines 7–9
  - (C) Lines 11–14
  - (D) Lines 17–20

### Section Three: Writing Skills:

#### I. Read the following passage then answer the questions that follows

The difference between a liquid and a gas is obvious under the conditions of temperature and pressure commonly found at the surface of the Earth. A liquid can be kept in an open container and fills it to the level of a free surface. A gas forms no free surface but tends to diffuse throughout the space available; it must therefore be kept in a closed container or held by a gravitation field, as in the case of a planet's atmosphere. The distinction was a prominent feature of early theories describing the phases of matter. In the nineteenth century, for example, one theory maintained that a liquid could be "dissolved" in a vapor without losing its identity, and another theory held that the two phases are made up of different kinds of molecules: liquidons and gasons. The theories now prevailing take a quite different approach by emphasizing what liquids and gases have in common. They are both forms of matter that have no permanent structure, and they both flow readily. They are fluids.

A. Give a title for the passage.

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B. Write down the topic sentence.

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C. Write down the supporting major ideas.

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#### II. Write a well-prepared essay about Only One of the following topics:

- Describe a scientific experiment that you know well. Why it is important to you?
- Compare between two of the special programs of faculty of engineering (CIE, BME, MTE, and B&E).

*Print of Luck*  
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**Final Exam**  
**"Form A Answer Key"**

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Please answer all of the following questions in the answer sheet. (Total marks 50)

**Section One: Structure and language Skills:**

I. **Restate** the following using the general techniques of paraphrasing:

**The answer of this question may vary according to the different paraphrasing strategies own by each student regarding to the what they have studied in the course.**

II. Read the following groups of words. In each one, underline the simple subject. Then circle the verb.

1. Fifty-three officers received medals at the Police Department awards ceremony.
2. Bored with the grown-up conversation, little Amy fell asleep under the kitchen table.
3. The number of businesses in this country has increased every year for the past decade.
4. According to scientists, birds and dinosaurs are biologically related.
5. All day and all night unceasingly fell the rain.

**Section Two: Reading Skills:**

I. Read the passage and answer the questions that follow: (Passage 1)

1. C
2. D
3. D
4. D
5. B
6. A
7. B
8. B
9. D
10. C

II. Read the passage and answer the questions that follow: (Passage 2)

11. C

- 12. A
- 13. C
- 14. D
- 15. A
- 16. D
- 17. C
- 18. B
- 19. A
- 20. B

### **Section Three: Writing Skills:**

**I. Read the following passage then answer the questions that follows**

- A. Give a title for the passage.
- B. Write down the topic sentence.
- C. Write down the supporting major ideas.

**The answer of this question may vary according to the different writing strategies own by each student regarding to the what they have studied in the course.**

**II. Write a well-prepared essay about Only One of the following topics:**

- Describe a scientific experiment that you know well. Why it is important to you?
- Compare between two of the special programs of faculty of engineering (CIE, BME, MTE, and BCE).

**The answer of this question may vary according to the different writing techniques own by each student regarding to the what they have studied in the course.**

*Best of Luck*  
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