

## Practice Test H - Reading

### Questions 1 - 10

The word laser was coined as an acronym for Light Amplification by the Stimulated Emission of Radiation. Ordinary light, from the Sun or a light bulb, is emitted spontaneously, when atoms or molecules get rid of excess energy by themselves, without any outside intervention. Stimulated emission is different because it occurs when an atom or molecule holding onto excess energy has been stimulated to emit it as light.

Line  
(5)

Albert Einstein was the first to suggest the existence of stimulated emission in a paper published in 1917. However, for many years physicists thought that atoms and molecules always were much more likely to emit light spontaneously and that stimulated emission thus always would be much weaker. It was not until after the Second World War that physicists began trying to make stimulated emission dominate. They sought ways by which one atom or molecule could stimulate many others to emit light, amplifying it to much higher powers.

(10)

The first to succeed was Charles H. Townes, then at Columbia University in New York. Instead of working with light, however, he worked with microwaves, which have a much longer wavelength, and built a device he called a "maser," for Microwave Amplification by the Stimulated Emission of Radiation. Although he thought of the key idea in 1951, the first maser was not completed until a couple of years later. Before long, many other physicists were building masers and trying to discover how to produce stimulated emission at even shorter wavelengths.

(15)

The key concepts emerged about 1957. Townes and Arthur Schawlow, then at Bell Telephone Laboratories, wrote a long paper outlining the conditions needed to amplify stimulated emission of visible light waves. At about the same time, similar ideas crystallized in the mind of Gordon Gould, then a 37-year-old graduate student at Columbia, who wrote them down in a series of notebooks. Townes and Schawlow published their ideas in a scientific journal, *physical Review Letters*, but Gould filed a patent application. Three decades later, people still argue about who deserves the credit for the concept of the laser.

(20)

(25)

- The word "coined" in line 1 could best be replaced by
  - created
  - mentioned
  - understood
  - discovered
- The word "intervention" in line 4 can best be replaced by
  - need
  - device
  - influence
  - source

3. The word "it" in line 5 refers to
  - (A) light bulb
  - (B) energy
  - (C) molecule
  - (D) atom
  
4. Which of the following statements best describes a laser?
  - (A) A device for stimulating atoms and molecules to emit light
  - (B) An atom in a high-energy state
  - (C) A technique for destroying atoms or molecules
  - (D) An instrument for measuring light waves
  
5. Why was Towne's early work with stimulated emission done with microwaves?
  - (A) He was not concerned with light amplification.
  - (B) It was easier to work with longer wavelengths.
  - (C) His partner Schawlow had already begun work on the laser.
  - (D) The laser had already been developed.
  
6. In his research at Columbia University, Charles Townes worked with all of the following EXCEPT
  - (A) stimulated emission
  - (B) microwaves
  - (C) light amplification
  - (D) a maser
  
7. In approximately what year was the first maser built?
  - (A) 1917
  - (B) 1951
  - (C) 1953
  - (D) 1957
  
8. The word "emerged" in line 20 is closest in meaning to
  - (A) increased
  - (B) concluded
  - (C) succeeded
  - (D) appeared
  
9. The word "outlining" in line 21 is closest in meaning to
  - (A) assigning
  - (B) studying
  - (C) checking
  - (D) summarizing
  
10. Why do people still argue about who deserves the credit for the concept of the laser?
  - (A) The researchers' notebooks were lost.
  - (B) Several people were developing the idea at the same time.
  - (C) No one claimed credit for the development until recently.
  - (D) The work is still incomplete.

### Questions 11 – 21

Panel painting, common in thirteenth- and fourteenth-century Europe, involved a painstaking, laborious process. Wooden planks were joined, covered with gesso to prepare the surface for painting, and then polished smooth with special tools. On this perfect surface, the artist would sketch a composition with chalk, refine it with inks, and then begin the deliberate process of applying thin layers of egg tempera paint (egg yolk in which pigments are suspended) with small brushes. The successive layering of these meticulously applied paints produced the final, translucent colors.

Backgrounds of gold were made by carefully applying sheets of gold leaf, and then embellishing or decorating the gold leaf by punching it with a metal rod on which a pattern had been embossed. Every step in the process was slow and deliberate. The quick-drying tempera demanded that the artist know exactly where each stroke be placed before the brush met the panel, and it required the use of fine brushes. It was, therefore, an ideal technique for emphasizing the hard linear edges and pure, fine areas of color that were so much a part of the overall aesthetic of the time. The notion that an artist could or would dash off an idea in a fit of spontaneous inspiration was completely alien to these deliberately produced works.

Furthermore, making these paintings was so time-consuming that it demanded assistance. All such work was done by collective enterprise in the workshops. The painter or master who is credited with having created the painting may have designed the work and overseen its production, but it is highly unlikely that the artist's hand applied every stroke of the brush. More likely, numerous assistants, who had been trained to imitate the artist's style, applied the paint. The carpenter's shop probably provided the frame and perhaps supplied the panel, and yet another shop supplied the gold. Thus, not only many hands, but also many shops were involved in the final product.

In spite of problems with their condition, restoration, and preservation many panel paintings have survived, and today many of them are housed in museum collections.

11. What aspect of panel paintings does the passage mainly discuss?

- (A) Famous examples
- (B) Different styles
- (C) Restoration
- (D) Production

12. According to the passage, what was the first step in making a panel painting?

- (A) Mixing the paint
- (B) Preparing the panel
- (C) Buying the gold leaf
- (D) Making ink drawings

13. The word "it" in line 4 refers to  
(A) chalk  
(B) composition  
(C) artist  
(D) surface
14. The word "deliberate" in line 5 is closest in meaning to  
(A) decisive  
(B) careful  
(C) natural  
(D) unusual
15. Which of the following processes produced the translucent colors found on panel paintings?  
(A) Joining wooden planks to form large sheets  
(B) Polishing the gesso  
(C) Applying many layers of paint  
(D) Covering the background with gold leaf
16. What characteristic of tempera paint is mentioned in the passage?  
(A) It dries quickly.  
(B) It is difficult to make.  
(C) It dissolves easily.  
(D) It has to be applied directly to wood.
17. The word "demanded" in line 17 is closest in meaning to  
(A) ordered  
(B) reported  
(C) required  
(D) questioned
18. The "collective enterprise" mentioned in line 18 includes all of the following EXCEPT  
(A) supplying the gold leaf  
(B) building the panels  
(C) applying the paint  
(D) selling the painting
19. The word "imitate" in line 22 is closest in meaning to  
(A) copy  
(B) illustrate  
(C) promote  
(D) believe in
20. The author mentions all of the following as problems with the survival of panel paintings EXCEPT  
(A) condition  
(B) theft  
(C) preservation  
(D) restoration
21. The word "them" in line 27 refers to  
(A) problems  
(B) condition, restoration, preservation  
(C) panel paintings  
(D) museum collections

## Questions 22 - 32

Crows are probably the most frequently met and easily identifiable members of the native fauna of the United States. The great number of tales, legends, and myths about these birds indicates that people have been exceptionally interested in them for a long time.

Line On the other hand, when it comes to substantive —particularly behavioral—information,  
(5) crows are less well known than many comparably common species and, for that matter, not a few quite uncommon ones: the endangered California condor, to cite one obvious example. There are practical reasons for this.

(10) Crows are notoriously poor and aggravating subjects for field research. Keen observers and quick learners, they are astute about the intentions of other creatures, including researchers, and adept at avoiding them. Because they are so numerous, active, and monochromatic, it is difficult to distinguish one crow from another. Bands, radio transmitters, or other identifying devices can be attached to them, but this of course requires catching live crows, who are among the wariest and most untrappable of birds.

(15) Technical difficulties aside, crow research is daunting because the ways of these birds are so complex and various. As preeminent generalists, members of this species ingeniously exploit a great range of habitats and resources, and they can quickly adjust to changes in their circumstances. Being so educable, individual birds have markedly different interests and inclinations, strategies and scams. For example, one pet crow learned how to let a dog out of its kennel by pulling the pin on the door. When the dog  
(20) escaped, the bird went into the kennel and ate its food.

22. What is the main topic of the passage?
- (A) The ways in which crows differ from other common birds
  - (B) The myths and legends about crows
  - (C) The characteristics that make crows difficult to study
  - (D) The existing methods for investigating crow behavior

23. According to the first paragraph, what evidence is there that crows have interested people for a long time?
- (A) The large number of stories about crows
  - (B) The frequency with which crows are sighted
  - (C) The amount of research that has been conducted on crows
  - (D) The ease with which crows are identified

24. The word “comparably” in line 5 is closest in meaning to
- (A) interestingly
  - (B) similarly
  - (C) otherwise
  - (D) sometimes
25. In line 6, the author mentions the endangered California condor as an example of a species that is
- (A) smaller than the crow
  - (B) easily identifiable
  - (C) featured in legends
  - (D) very rare
26. The word “them” in line 10 refers to
- (A) crows
  - (B) subjects
  - (C) intentions
  - (D) researchers
27. According to the second paragraph crows are poor subjects for field research for all of the following reasons EXCEPT:
- (A) They can successfully avoid observers.
  - (B) They are hard to distinguish from one another.
  - (C) They can be quite aggressive.
  - (D) They are difficult to catch.
28. In the second paragraph, the author implies that using radio transmitters would allow a researcher who studies crows to
- (A) identify individual crows
  - (B) follow flocks of crows over long distances
  - (C) record the times when crows are most active
  - (D) help crows that become sick or injured

29. According to the third paragraph, which of the following is true about crows?
- (A) They seldom live in anyone place for very long.
  - (B) They thrive in a wide variety of environments.
  - (C) They have marked preferences for certain kinds of foods.
  - (D) They use up the resources in one area before moving to another.
30. In line 19, the word "inclinations" is closest in meaning to
- (A) tricks
  - (B) opportunities
  - (C) preferences
  - (D) experiences
31. In lines 19-21, the author mentions a pet crow to illustrate which of the following?
- (A) The clever ways that crows solve problems
  - (B) The differences between pet crows and wild crows
  - (C) The ease with which crows can be tamed
  - (D) The affection that crows show to other creatures
32. Which of the following statements is supported by the passage?
- (A) Crows have relatively long lives.
  - (B) Crows have keen vision.
  - (C) Crows are usually solitary.
  - (D) Crows are very intelligent.

**Questions 33 – 41**

In the early days of the United States, postal charges were paid by the recipient, and charges varied with the distance carried. In 1825, the United States Congress permitted local postmasters to give letters to mail carriers for home delivery, but these carriers received no government salary and their entire compensation depended on what they were paid by the recipients of individual letters.

Line  
(5)

In 1847 the United States Post Office Department adopted the idea of a postage stamp, which of course simplified the payment for postal service but caused grumbling by those who did not like to prepay. Besides, the stamp covered only delivery to the post office and did not include carrying it to a private address. In Philadelphia, for example, with a population of 150,000, people still had to go to the post office to get their mail. The confusion and congestion of individual citizens looking for their letters was itself enough to discourage use of the mail. It is no wonder that, during the years of these cumbersome arrangements, private letter-carrying and express businesses developed. Although their activities were only semilegal, they thrived, and actually advertised that between Boston and Philadelphia they were a half-day speedier than the government mail. The government postal service lost volume to private competition and was not able to handle efficiently even the business it had.

(10)

(15)

Finally, in 1863, Congress provided that the mail carriers who delivered the mail from the post offices to private addresses should receive a government salary, and that there should be no extra charge for that delivery. But this delivery service was at first confined to cities, and free home delivery became a mark of urbanism. As late as 1887, a town had to have 10,000 people to be eligible for free home delivery. In 1890, of the 75 million people in the United States, fewer than 20 million had mail delivered free to their doors. The rest, nearly three-quarters of the population, still received no mail unless they went to their post office.

(20)

(25)

33. What does the passage mainly discuss?

- (A) The increased use of private mail services
- (B) The development of a government postal system
- (C) A comparison of urban and rural postal services
- (D) The history of postage stamps

34. The word "varied" in line 2 could best be replaced by

- (A) increased
- (B) differed
- (C) returned
- (D) started



35. Which of the following was seen as a disadvantage of the postage stamp?  
(A) It had to be purchased by the sender in advance.  
(B) It increased the cost of mail delivery .  
(C) It was difficult to affix to letters.  
(D) It was easy to counterfeit.
36. Why does the author mention the city of Philadelphia in line 9?  
(A) It was the site of the first post office in the United States.  
(B) Its postal service was inadequate for its population.  
(C) It was the largest city in the United States in 1847.  
(D) It was commemorated by the first United States postage stamp.
37. The word “cumbersome” in line 13 is closest in meaning to  
(A) burdensome  
(B) handsome  
(C) loathsome  
(D) quarrelsome
38. The word “they” in line 15 refers to  
(A) Boston and Philadelphia  
(B) businesses  
(C) arrangements  
(D) letters
39. The private postal services of the nineteenth century claimed that they could do which of the following better than the government?  
(A) Deliver a higher volume of mail.  
(B) Deliver mail more cheaply.  
(C) Deliver mail faster.  
(D) Deliver mail to rural areas.
40. In 1863 the United States government began providing which of the following to mail carriers?  
(A) A salary  
(B) Housing  
(C) Transportation  
(D) Free postage stamps
41. The word “confined” in line 21 is closest in meaning to  
(A) granted  
(B) scheduled  
(C) limited  
(D) recommended

### Questions 42 – 50

Archaeology has long been an accepted tool for studying prehistoric cultures. Relatively recently the same techniques have been systematically applied to studies of the more immediate past. This has been called “historical archaeology,” a term that is used in the United States to refer to any archaeological investigation into North American sites that postdate the arrival of Europeans.

(5) Back in the 1930's and 1940's, when building restoration was popular, historical archaeology was primarily a tool of architectural reconstruction. The role of archaeologist was to find the foundations of historic buildings and then take a back seat to architects.

(10) The mania for reconstruction had largely subsided by the 1950' sand 1960' s. Most people entering historical archaeology during this period came out of university anthropology departments, where they had studied prehistoric cultures. They were, by training, social scientists, not historians, and their work tended to reflect this bias. The questions they framed and the techniques they used were designed to help them understand, as scientists, how people behaved. But because they were treading on

(15) historical ground for which there was often extensive written documentation, and because their own knowledge of these periods was usually limited, their contributions to American history remained circumscribed. Their reports, highly technical and sometimes poorly written, went unread.

(20) More recently, professional archaeologists have taken over. These researchers have sought to demonstrate that their work can be a valuable tool not only of science but also of history, providing fresh insights into the daily lives of ordinary people whose existences might not otherwise be so well documented. This newer emphasis on archaeology as social history has shown great promise, and indeed work done in this area has lead to a reinterpretation of the United States past.

(25) In Kingston, New York, for example, evidence has been uncovered that indicates that English goods were being smuggled into that city at a time when the Dutch supposedly controlled trading in the area. And in Sacramento an excavation at the site of a fashionable nineteenth-century hotel revealed that garbage had been stashed in the building's basement despite sanitation laws to the contrary.

42. What does the passage mainly discuss?
- (A) Why historical archaeology was first developed
- (B) How the methods and purpose of historical archaeology have changed
- (C) The contributions architects make to historical archaeology
- (D) The attitude of professional archaeologists toward historical archaeology
43. According to the first paragraph, what is a relatively new focus in archaeology?
- (A) Investigating the recent past
- (B) Studying prehistoric cultures
- (C) Excavating ancient sites in what is now the United States
- (D) Comparing findings made in North America and in Europe

44. According to the passage, when had historical archaeologists been trained as anthropologists?
- (A) Prior to the 1930's
  - (B) During the 1930's and 1940's
  - (C) During the 1950' sand 1960's
  - (D) After the 1960's
45. The word "framed" in line 13 is closest in meaning to
- (A) understood
  - (B) read
  - (C) avoided
  - (D) posed
46. In the third paragraph, the author implies that the techniques of history and the techniques of social science are
- (A) quite different from each other
  - (B) equally useful in studying prehistoric cultures
  - (C) usually taught to students of archaeology
  - (D) both based on similar principles
47. The phrase "their contributions" in line 16 refers to the contributions of
- (A) social scientists
  - (B) prehistoric cultures
  - (C) historians
  - (D) documentation and knowledge
48. The author mentions an excavation at the site of a hotel in Sacramento in order to give an example of
- (A) a building reconstruction project
  - (B) the work of the earliest historical archaeologists
  - (C) a finding that conflicts with written records
  - (D) the kind of information that historians routinely examine
49. The word "supposedly" in line 26 is closest in meaning to
- (A) ruthlessly
  - (B) tightly
  - (C) barely
  - (D) seemingly
50. The word "sanitation" in line 29 is closest in meaning to
- (A) city
  - (B) housing
  - (C) health
  - (D) trade

## Practice Test H – Answers

Number	Answers
1	A
2	C
3	B
4	A
5	B
6	C
7	C
8	D
9	D
10	B
11	D
12	B
13	B
14	B
15	C
16	A
17	C
18	D
19	A
20	B
21	C
22	C
23	A
24	B
25	D
26	D
27	C
28	A
29	B
30	C
31	A
32	D
33	B
34	B
35	A
36	B
37	A
38	B
39	C
40	A

41	C
42	B
43	A
44	C
45	D
46	A
47	A
48	C
49	D
50	C

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