In the past decade, rapid technological progress and a greater demand for high-quality digital imaging have led to dramatic advances in video display technology. The dominant technology currently used in most consumer product displays is the active matrix liquid crystal diode display (LCD).  
  
LCDs apply thin-film transistors (TFTs) of amorphous or polycrystalline silicon sandwiched between two glass plates. The TFTs supply voltage to liquid-crystal-filled cells, or pixels, between the sheets of glass. When hit with an electric charge, the liquid crystals untwist to an exact degree to filter white light generated by a lamp. This filtered light shines directly on the viewing screen or, in the case of projection televisions, is projected through a small chip that acts as a lens. LCDs that are capable of producing colour images, such as in televisions and computers, reproduce colours through a process of subtraction, blocking out particular color wavelengths from the spectrum of white light until only the desired colour remains. It is the variation of the intensity of light permitted to pass through the matrix of liquid crystals that enables LCD displays to present images full of gradations of different colours.  
  
The nature and functioning of LCD displays present many advantages relative to other display technologies. The amount of power required to untwist the crystals to display images, even dark ones, is much lower than that required for analogous processes using other technologies, such as plasma. The dense array of crystals displays images from computer or other video graphics sources extremely well, with full color detail, no flicker, and no screen burning. Moreover, the number of pixels per square inch on an LCD display is typically higher than that for other display technologies, so LCD monitors are particularly good at displaying large amounts of data with exceptional clarity and precision. As a result, LCD TVs are considered the best display platform for video games, high definition television, movie special effects, and other graphics intensive uses.

1. **The tone of the passage could best be described as**  
     
   A. supportive advocacy  
   B. historical discussion  
   C. disinterested explanation  
   D. intellectual exploration  
   E. qualified support
2. **The passage indicates that each of the following may be considered an advantage of LCD displays relative to other display technologies EXCEPT**  
     
   A. they consume less power  
   B. they generally have more pixels per square inch of the display  
   C. they are able to display continuous video graphics images with no interruption  
   D. they reflect a widely adopted standard  
   E. they represent the latest, most advanced technology
3. **The process through which an LCD monitor displays different colours is most closely analogous to**  
     
   A. An hourglass partially blocked such that a limited stream of grains of sand fall into the lower portion  
   B. A series of filters that separate all of the components of a mixture according to size  
   C. A recording studio soundproofed so that any performances within are muted to those outside  
   D. A piece of construction paper with outlines of characters cut out such that a lamp in front of the paper casts shadows in the shapes of the characters  
   E. An air vent that emits warmer air outside of a building while an air conditioning system cools the interior of the building

1. **It can be inferred from the passage that an LCD monitor would utilize the most electrical power when displaying**  
     
   A. a movie scene of a NASCAR race with many computer-generated special effects  
   B. the introduction sequence for a World War II video game  
   C. a bright daytime television broadcast of a parade  
   D. a photorealistic screen saver of a bouquet of flowers  
   E. a filmed scene set inside a cave with minimal lighting

Electroconvulsive therapy (ECT) is a controversial psychiatric treatment involving the induction of a seizure in a patient by passing electricity through the brain. While beneficial effects of electrically Induced seizures are evident and predictable in most patients, a unified mechanism of action has not yet been established and remains the subject of numerous investigations. ECT is extremely effective against severe depression, some acute psychotic states, and mania, though, like many medical procedures, It has its risks.  
  
Since the inception of ECT in 1938, the public has held a strongly negative conception of the procedure. Initially, doctors employed unmodified ECT. Patients were rendered Instantly unconscious by the electrical current, but the strength of the muscle contractions from uncontrolled motor seizures often led to compression fractures of the spine or damage to the teeth. In addition to the effect this physical trauma had on public sentiment graphic examples of abuse documented In books and movies, such as Ken Kesey's One Flew Over the Cuckoo's Nest, portrayed ECT as punitive, cruel, overused, and violative of patients' legal rights.  
  
Modem ECT is virtually unrecognizable from Its earlier days. The treatment Is modified by the muscle relaxant succinylcholine, which renders muscle contractions practically nonexistent. Additionally, patients are given a general anesthetic. Thus, the patient is asleep and fully unaware during the procedure, and the only outward sign of a seizure may be the rhythmic movement of the patient's hand or foot. ECT is generally used In severely depressed patients for whom psychotherapy and medication prove ineffective. It may also be considered when there Is an imminent risk of suicide, since antidepressants often take several weeks to work effectively. Exactly how ECT exerts its effects is not known, but repeated applications affect several neurotransmitters In the brain, Including serotonin, norepinephrine, and dopamine.  
  
ECT has proven effective, but it Is not without controversy. Though decades old studies showing brain cell death have been refuted in recent research, many patients do report loss of memory for events that occurred in the days, weeks, or months surrounding the ECT. Some patients have also reported that their short-term memories continue to be affected for months after ECT, though some doctors argue that this memory malfunction may reflect the type of amnesia that sometimes results from severe depression.

**1. According to the passage, why has ECT been viewed negatively by the public?**  
  
(A) Though ECT is effective in many cases, the medical community is not certain exactly how it works.  
(B)Cultural depictions of ECT implied that the therapy infringed upon the lawful rights of those receiving the treatment.  
(C) Effective use of ECT requires exposure to concerning medications, such as muscle relaxants and anesthesia.  
(D) ECT does not benefit individuals with anxiety disorders.  
(E) ECT cannot be performed without subsequent loss of memory in the patient.

**2. Which of the following can be inferred about the way in which the modern form of ECT works?**  
  
(A) Greater amounts of the neurotransmitters serotonin, norepinephrine, and dopamine seem to reduce symptoms of depression.  
(B) ECT cannot be used prior to attempting psychotherapy or medication.  
(C) Succinylcholine completely immobilizes the patient's body.  
(D) ECT generally works faster than antidepressants.  
(E) One ECT treatment is often sufficient to reduce symptoms of depression significantly.

**3. The author mentions amnesia as a possible side effect of severe depression in order to**  
  
(A) acknowledge one of the possible negative side effects associated with ECT  
(B) emphasize the seriousness of severe depression as a debilitating disease  
(C) introduce a possible alternative cause for short-term memory loss reported by some patients  
(D) draw a connection between brain cell death and short-term memory loss  
(E) refute claims that ECT is responsible for any form of amnesia in patients

**4. Each of the following is cited in the passage as a current or historical criticism of electroconvulsive therapy *EXCEPT***  
  
(A) ECT may cause the death of brain cells and memory loss  
(B) in certain cases, ECT was portrayed as a means to punish individuals  
(C) ECT had the potential to be used in inappropriate situations  
(D) early forms of ECT did not adequately protect patients from secondary harm brought on by the treatment  
(E) repeated applications of ECT affect several neurotransmitters in the brain

**5. The tone of the passage suggests that the author regards ECT with**  
  
(A) conditional support  
(B) academic objectivity  
(C) mild advocacy  
(D) unreserved criticism  
(E) increasing acceptance

Historians have long recognized the Japanese sword, or nihonto, as one of the fin¬est cutting weapons ever produced. But to regard the sword that is synonymous with the samurai as merely a weapon Is to ignore what makes It so special. The Japanese sword has always been considered a splendid weapon and even a spiritual entity. The traditional Japanese adage the sword is the soul of the samurai" reflects not only the sword's importance to Its wielder but also its permanent connection to its creator, the master smith.  
  
Master smiths may not have been considered artists in the classical sense, but each smith exerted great care in the process of creating swords, no two of which were ever forged in exactly the same way. Over hundreds of hours, two types of steel were repeatedly heated, hammered and folded together into thousands of very thin layers, producing a sword with an extremely sharp and durable cutting edge and a flexible, shock-absorbing blade. It was common, though optional, for a master smith to place a physical signature on a blade; moreover, each smith's secret forging techniques left an idiosyncratic structural signature on his blades. Each master smith brought a high level of devotion, skill, and attention to detail to the sword-making process, and the sword it¬self was a reflection of his personal honor and ability. This effort made each blade as distinctive as the samurai who wielded it such that today the Japanese sword is recognized as much for its artistic merit as for its historical significance.



**1. The primary purpose of the passage is to**  
  
(A) challenge the observation that the Japanese sword is highly admired by historians  
(B) introduce new information about the forging of Japanese swords  
(C) discuss an obsolete weapon of great historical significance  
(D) argue that Japanese sword makers were motivated by honor  
(E) explain the value attributed to the Japanese sword

**2. Which of the following is the primary function of the second paragraph?**  
  
(A) To present an explanation for a change in perception  
(B) To determine the historical significance of Japanese swords  
(C) To discuss the artistic aspects associated with creating Japanese swords  
(D) To compare Japanese master smiths to classical artists  
(E) To review the complete process of making a Japanese sword

**3. Which of the following can be inferred about the structural signature of a Japanese sword?**  
  
(A) It is an inscription that the smith places on the blade during the forging process.  
(B) It refers to the particular characteristics of a blade created by a smith's unique forging process.  
(C) It suggests that each blade can be traced back to a known master smith.  
(D) It reflects the soul of the samurai who wielded the sword.  
(E) It refers to the actual curved shape of the blade.

**4. Each of the following is mentioned in the passage *EXCEPT***  
  
(A) Every Japanese sword has a unique structure that can be traced back to a special forging process.  
(B) Master smiths kept their forging techniques secret.  
(C) The Japanese sword was considered by some to have a spiritual quality.  
(D) Master smiths are now considered artists by most major historians.  
(E) The Japanese sword is considered both a work of art and a historical artifact.

**5. The author explains the way in which swords were made in order to**  
  
(A) establish that the Japanese sword is the most important handheld weapon in history  
(B) claim that the skill of the samurai is what made each Japanese sword unique  
(C) support the contention that the master smiths might be considered artists as well as craftsmen  
(D) illustrate that master smiths were more concerned with the artistic merit of their blades than with the blades' practical qualities  
(E) demonstrate that the Japanese sword has more historical importance than artistic importance

In the early years of television, Vladimir Zworykin was, at least in the public sphere, recognized as its inventor. His loudest champion was his boss, David Sarnoff, then president of RCA and a man that we regard even today as "the father of television." Current historians agree, however, that Philo Farnsworth, a self-educated [prodigy](https://gmatclub.com/blog/go/prodigy/) who was the first to transmit live images, was television's true inventor.  
  
In his own time, Farnsworth's contributions went largely unnoticed, in large part because he was excluded from the process of introducing the invention to a national audience. Sarnoff put televisions into living rooms, and Sarnoff was responsible for a dominant paradigm of the television industry that continues to be relevant today: advertisers pay for the programming so that they can have a receptive audience for their products. Sarnoff had already utilized this construct to develop the radio industry, and it had, within ten years, become ubiquitous. Farnsworth thought the television should be used as an educational tool, but he had little understanding of the business world, and was never able to implement his ideas.  
  
Perhaps one can argue that Sarnoff simply adapted the business model for radio and television from the newspaper industry, replacing the revenue from subscriptions and purchases of individual newspapers with that of selling the television sets themselves, but Sarnoff promoted himself as nothing less than a visionary. Some television critics argue that the construct Sarnoff implemented has played a negative role in determining the content of the programs themselves, while others contend that it merely created a democratic platform from which the audience can determine the types of programming it wants.

**1. The primary purpose of the passage is to**  
  
(A) correct public misconception about Farnsworth's role in developing early television programs  
(B) debate the influence of television on popular culture  
(C) challenge the current public perception of Vladimir Zworykin  
(D) chronicle the events that led up to the invention of the television  
(E) describe Sarnoff's influence on the public perception of television's inception, and debate the impact of Sarnoff's paradigm

**2. It can be inferred from the third paragraph of the passage that**  
  
(A) television shows produced by David Sarnoff and Vladimir Zworykin tended to earn negative reviews  
(B) educational programs cannot draw as large an audience as sports programs  
(C) a number of critics feel that Sarnoff's initial decision to earn television revenue through advertising has had a positive or neutral impact on content  
(D) educational programs that are aired in prime time, the hours during which the greatest number of viewers are watching television, are less likely to earn a profit than those that are aired during the daytime hours  
(E) in matters of programming, the audience's preferences should be more influential than those of the advertisers

**3. Which of the following best illustrates the relationship between the second and third paragraphs?**  
  
(A) The second paragraph dissects the evolution of a contemporary controversy; the third paragraph presents differing viewpoints on that controversy.  
(B) The second paragraph explores the antithetical intentions of two men involved in the infancy of an industry; the third paragraph details the eventual deterioration of that industry.  
(C) The second paragraph presents differing views of a historical event; the third paragraph represents the author's personal opinion about that event,  
(D) The second paragraph provides details that are necessary to support the author's opinion, which is presented in the third paragraph.  
(E) The second paragraph presents divergent visions about the possible uses of a technological device; the third paragraph initiates a debate about the ramifications of one of those perspectives.

**4. According to the passage, the television industry, at its inception, earned revenue from**  
  
(A) advertising only  
(B) advertising and the sale of television sets  
(C) advertising and subscriptions  
(D) subscriptions and the sale of television sets  
(E) advertising, subscriptions, and the sale of television sets

**5. The passage suggests that Farnsworth might have earned greater public notoriety for his invention if**  
  
(A) Vladimir Zworykin had been less vocal about his own contributions to the television  
(B) Farnsworth had been able to develop and air his own educational programs  
(C) Farnsworth had involved Sarnoff in his plans to develop, manufacture, or distribute the television  
(D) Sarnoff had involved Farnsworth in his plans to develop, manufacture, or distribute the television  
(E) Farnsworth had a better understanding of the type of programming the audience wanted to watch most