



1. One type of these cells does its job by expressing the Fas ligand on its surface or releasing perforin to start the caspase cascade. Their surface projects a complex made up of alpha and beta chains linked by a disulfide bond, the TCR, which recognizes epitopes presented by the major histocompatibility complex on other cells. Their "cytotoxic," or "killer" variety attacks cancerous cells and cells infected by viruses. For 15 points, name these white blood cells so named because they mature in the thymus, unlike B cells.

ANSWER: **T-cells** [or cytotoxic **T cells**]

080-12-85-18101

BONUS: *Nurse Jackie*, *Dexter*, and *Homeland* are broadcast on what premium cable channel?

ANSWER: **Showtime**

019-12-85-1810-1

2. One sculpture by this man depicts six leaders offering themselves up to execution at the hands of Edward III. He included *The Three Shades* in a large bronze doorway whose other scenes include miniature versions of his most famous works. His other sculptures include a marble one of Paolo and Francesca embracing and another of Dante resting his chin on the back of his hand. For 15 points, name this French sculptor of *The Kiss* and *The Thinker*.

ANSWER: Auguste **Rodin**

014-12-85-18102

BONUS: What tallest peak in the contiguous United States is partially located in Sequoia National Park in California?

ANSWER: Mount **Whitney**

066-12-85-1810-1

3. This baseball player was the subject of the biography *Love Me, Hate Me*. This man won his first MVP award playing in an outfield with Andy Van Slyke as part of a strong 1990's Pittsburgh Pirates team. The godson of Willie Mays, he was the first man to ever have 400 home runs and 400 stolen bases in a career. For 15 points, name this longtime outfielder for the San Francisco Giants, baseball's all time home run leader frequently accused of using steroids.

ANSWER: Barry Lamar **Bonds**

052-12-85-18103

BONUS: What experiment used an interferometer to disprove the existence of the luminiferous aether?

ANSWER: **Michelson-Morley** experiment

192-12-85-1810-1

4. The unnamed narrator of one story by this author barely escapes an Inquisition torture device when rats gnaw through his ropes. He wrote another story in which the narrator turns himself into the police when he hears the beating of the title object under his floorboards. This author of "The Pit and the Pendulum" and "The Tell-Tale Heart" also wrote about Montresor, who takes revenge on Fortunato by bricking him in. For 15 points, name this American author of "The Cask of Amontillado."

ANSWER: Edgar Allan **Poe**

015-12-85-18104

BONUS: In what 1776 book did Adam Smith propose an “invisible hand” which guides the free market?

ANSWER: *The Wealth of Nations* [or *An Inquiry into the Nature and Causes of the Wealth of Nations*]

014-12-85-1810-1

5. One story relates that this man was banished after throwing his nephew Perdix off a cliff. He built a wooden cow for Pasiphae (PAH-si-fay) so that she could sleep with a bull without dying. Faced with trying to imprison the Minotaur, King Minos tasked this man with building the labyrinth. After this man was imprisoned, he escaped by designing wings from wax and feathers, although his son Icarus died when he flew too close to the sun. For 15 points, name this inventor from Greek mythology.

ANSWER: Daedalus

015-12-85-18105

BONUS: What Russian dramatist wrote *Uncle Vanya* and created Madame Ranevskaya in *The Cherry Orchard*?

ANSWER: Anton Chekhov [or Anton Pavlovich Chekhov]

088-12-85-1810-1

6. The three-stage Atkinson-Shiffrin model governs this process, which is aided by the primacy and recency effects according to Hermann Ebbinghaus. Proactive and retroactive interference impede this phenomenon, which is linked to the brain area called the hippocampus. Psychologists often refer to the “working” form of this mental ability rather than its “short term” and “long term” subtypes. For 15 points, name this process by which minds store and retrieve past experiences.

ANSWER: memory [accept short-term memory, long-term memory, or working memory]

104-12-85-18106

BONUS: What Nigerian playwright wrote *The Lion and the Jewel* and *Death and the King's Horseman*?

ANSWER: Wole Soyinka [or Akinwande Oluwole Soyinka]

192-12-85-1810-1

7. Carl Correns helped popularize this figure's discoveries after his terms were appropriated without credit by Hugo de Vries. This scientist first noted that his F2 group consistently had a 3 to 1 ratio for what he called "factors." This man's ideas are often explained using a Punnett square diagram, and he devised the law of independent assortment and the law of segregation. For 15 points, name this Austrian friar whose experiments on pea plants underlie modern genetics.

ANSWER: Gregor Johann Mendel

104-12-85-18107

BONUS: What John Steinbeck novel adapts the story of Cain and Abel into the saga of the Trask family?

ANSWER: East of Eden

052-12-85-1810-1

8. In this play, Si Crowell repaces his older brother Joe as the paper boy, and Mrs. Soames likes to gossip about the drunken antics of the choirmaster Simon Stimson. The third act of this play takes place in a cemetery, where the protagonist speaks from the grave after dying in childbirth. It concerns the courtship and marriage of George Gibbs and Emily Webb in the small town of Grover's Corners. For 15 points, name this play which is narrated by a Stage Manager, a work by Thornton Wilder.

ANSWER: Our Town

015-12-85-18108

BONUS: This is a 20-second calculation question. What is the positive root of $-32x^2 - 36x + 18$?

ANSWER: $x = \underline{3/8}$

001-12-85-1810-1

9. One side in this battle was led by Tadamichi Kuribayashi, who took the innovative approach of letting the enemy land before opening fire. Much of the fighting here was over Mount Suribachi. This location was the subject of a pair of English and Japanese language movies directed by Clint Eastwood. Joe Rosenthal took a photograph of four marines raising the American flag during this battle. For 15 points, name this year-long battle over a Pacific island seven hundred miles south of Japan.

ANSWER: Battle of **Iwo Jima**

015-12-85-18109

BONUS: This is a 20-second calculation question. How many diagonals are there in a convex pentagon?

ANSWER: **5**

003-12-85-1810-1

10. Compounds of these elements are often paramagnetic, and electronic transitions in compounds of these elements can be understood through Tanabe-Sugano diagrams. A complex ion centered around an ion of these elements binds to a ligand in a coordination compound. The lanthanides and actinides are called "inner" ones of these elements. These elements have partially or fully filled d orbitals. Scandium is the lightest of these elements, and other examples include copper, silver, and gold. For 15 points, name these elements located in groups three through twelve of the periodic table.

ANSWER: **transition metals** [or **transition elements**]

131-12-85-18110

BONUS: What author who wrote about the Mac-Ivors in *Waverley* also wrote *Rob Roy*?

ANSWER: Walter **Scott**

088-12-85-1810-1

11. The only known natural, self-sustaining form of the process denoted by this term occurred at Oklo in Gabon. In biology, this term is applied to a process in which the protein FtsZ starts the formation of a septum. In physics, this term denotes a process first demonstrated by a team led by Otto Hahn. In biology, this term applies to a form of bacterial replication and is prefixed by binary when the parent splits into two daughters. For 15 points, identify this term that, in physics, is a process in which an atom's nucleus is split apart.

ANSWER: **fission**

066-12-85-18111

BONUS: What English scientist estimated the age of the Earth with heated cannonballs and created a temperature scale that starts at absolute zero?

ANSWER: William **Thomson** [or Lord **Kelvin**; or Baron **Kelvin**]

121-12-85-1810-1

12. This composer utilized maracas and bongos in his *Cuban Overture*. A fisherman named Jake sings "A Woman is a Sometime Thing" in an opera by this composer, which includes an aria about a time "when the livin' is easy." His most famous composition, which premiered during the "An Experiment in Modern Music" concert, opens with a seventeen-note clarinet glissando. For 15 points, identify this American composer of *Porgy and Bess* and *Rhapsody in Blue*.

ANSWER: George **Gershwin**

189-12-85-18112

BONUS: This is a 20-second calculation question. If sine of x equals 3/5 and cosine of x equals 4/5, what is sine of two times x?

ANSWER: **24/25** [or **0.96**]

003-12-85-1810-1

13. An expedition of this force prompted a speech at Tilbury by a woman who claimed to "have the heart and stomach of a king." This force was prevented from meeting up with troops of the Duke of Parma at the Battle of Gravelines, where it was defeated by Francis Drake. Storms that blew this force off course were called the "Protestant Wind" by this force's English enemies. For 15 points, name this Spanish fleet that failed to invade England in 1588.

ANSWER: Spanish **Armada** [or Invincible **Armada**; or **Armada** Espanola; or **Armada** Invencible]

121-12-85-18113

BONUS: This is a 30-second calculation question. The test scores in a certain statistics class were normally distributed, with 95% falling between 49 and 85. What was the standard deviation of the scores?

ANSWER: **9**

174-12-85-1810-1

14. One citizen of this city had his head thrown into his brother's camp after losing the Battle of the Metaurus River. That man was Hasdrubal, who along with Mago, Hanno, and Hamilcar was a member of this city's Barca family. This city's forces lost the Battle of Zama to Scipio Africanus, who salted its land so that nothing could grow according to a popular legend. For 15 points, name this North African city led by Hannibal, which fought several Punic Wars against Rome.

ANSWER: **Carthage** [or **Carthago**; or **Kart-hadasht**]

015-12-85-18114

BONUS: Which President oversaw the start of a two-year embargo on foreign trade and signed the Louisiana Purchase?

ANSWER: Thomas **Jefferson**

104-12-85-1810-1

15. In a war this man won, he was opposed by American volunteers fighting in the Abraham Lincoln Brigade. This man was assisted in that same war by Germany, with the Condor Legion being responsible for the bombing of Guernica. This man merged the Carlist and Falange (fal-AHN-hay) parties, and he defeated Republican forces with his Nationalist troops in 1939. For 15 points, name this dictator whose death in 1975 brought Juan Carlos to the throne of Spain.

ANSWER: Francisco Paulino Hermenegildo Teodulo **Franco** Bahamonde

052-12-85-18115

BONUS: What leader of the Second Viennese School developed the twelve tone technique?

ANSWER: Arnold **Schoenberg**

149-12-85-1810-1

16. This novel's story was expanded in a 2006 novel by Geraldine Brooks. Its protagonists give the German Hummel family blankets and firewood. One of its characters gives birth to the twins Demi and Daisy. Another character in this novel is rescued by Laurie after falling through thin ice. The Professor Fritz Bhaer eventually marries Jo, whose sister Beth dies of scarlet fever. For 15 points, name this Civil War novel about the four March sisters which was written by Louisa May Alcott.

ANSWER: **Little Women**

015-12-85-18116

BONUS: Word forms of what term can refer to either the transfer of heat by direct contact or to the reciprocal of electrical resistivity?

ANSWER: **conduction** [or word forms]

195-12-85-1810-1

17. The medical condition astigmatism occurs in this organ. Oxidation of vitamin A results in the production of the pigment-bearing portion of rhodopsin, which is found in this organ. This organ contains the fovea, which is found at the center of the macula and contains a high concentration of cone cells. The name given to this organ also names the calm weather found at the center of cyclones, such as hurricanes. For 15 points, identify this organ that detects light and allows sight.

ANSWER: **eye**

066-12-85-18117

BONUS: What object is known as "zvezda" (zuh-VEZ-duh) in Russian, "kohav" (COH-hov) in Hebrew, and "stella" in Latin?

ANSWER: a **star**

019-12-85-1810-1

18. These devices contain parallel concentric, or spiral, tracks, which are divided into blocks. The time it takes the actuator arm to move the head to a track is the seek time of these devices. One type of failure in these devices occurs when that read/write head comes into contact with a rotating platter, which is coated with a magnetic oxide. For 15 points, name these secondary, or non-volatile, storage devices that commonly come in sizes of two point five and three point five inches.

ANSWER: **hard disk drive** [or **HDD**; or **disk drive**; or **computer disk**]

066-12-85-18118

BONUS: What Marc Chagall painting shows a cow being milked and a giant green face?

ANSWER: **I and the Village**

088-12-85-1810-1

19. This lake will be the location of the HiSCORE, which will be the world's largest cosmic ray observatory. Its only outflow is the Angara River, and the Chikoy and Selenga rivers flow into it. Goryachinsky (GOE-ree-uh-CHIN-skee) is a resort located on its shores, as is the Barguzinsky (BAR-goo-ZIN-skee) Nature Reserve. This lake is the home of the nerpas, the world's only freshwater seals, as well as the golomyanka, a fish that gives birth to live young. For 15 points, name this Siberian lake, the deepest in the world.

ANSWER: Lake **Baikal**

030-12-85-18119

BONUS: What integration technique, related to the chain rule for derivatives, involves rewriting the integrand in a more manageable form and then changing it back after performing the integration?

ANSWER: integration by u-**substitution** [or word forms]

195-12-85-1810-1

20. This character buys a pair of horses and talks to them for four hours a day as a result of the extreme misanthropy he experiences after the Portuguese captain Don Pedro de Mendez transports him home. This character helps defeat the Blefuscudian navy while allied with the residents of Lilliput, and he is repulsed by the similarity between humans and the savage Yahoos. For 15 points, name this character whose "travels" are recounted in a novel by Jonathan Swift.

ANSWER: Lemuel **Gulliver** [or **Lemuel** Gulliver]

014-12-85-18120

BONUS: What Greek, sometimes known as the "Father of History" or as the "Father of Lies," recorded the Persian Wars in his *The Histories*?

ANSWER: **Herodotus**

195-12-85-1810-1

21. 250,000 people visit this city's Grand Bazaar every day. The Serpent Column and an Egyptian obelisk created by Thutmose III can be found in this city's Hippodrome. The Galata Bridge crosses this city's harbor, the Golden Horn. This city, whose name may be Greek for "to the city," also contains a former Christian basilica to which minarets were added when it became a mosque. Home to the Hagia Sophia, it is divided across two continents by the Bosphorus. For 15 points, name this largest city in Turkey, which was formerly known as Constantinople.

ANSWER: **Istanbul** [or **Constantinople** before it is read; or **Byzantium**]

080-12-85-18121

BONUS: What symbol of Buddhism is the fig tree with heart-shaped leaves under which Siddhartha Gautama attained enlightenment?

ANSWER: **Bodhi tree**

019-12-85-1810-1

22. Organisms in this phylum detect light through a pair of eyespots on top of their triangular heads. Like rotifers, they have a set of tubules called protonephridia that terminate in flame cells. Despite being bilaterians, they lack a body cavity and have only one orifice, and excrete via diffusion. These hermaphroditic organisms reproduce through a ritual of "fencing" one another with the male organ. Including monogeneans and planarians, this phylum also contains tapeworms and other parasites. For 15 points, name this phylum of flatworms.

ANSWER: **platyhelminthes** [or **flatworms** before it is read]

080-12-85-18122

BONUS: "Legs," "Sleeping Bag," and "Sharp Dressed Man" were among the 1980s hits of what band, known for their Texas rock sound and their long beards?

ANSWER: **ZZ Top**

019-12-85-1810-1

23. One character in this novel inwardly rages at how his colleagues talk about a woman, "degrading her to so much mutton," concluding, "what makes it worse, she thinks of herself as meat." The protagonist of this novel isolates himself in a lighthouse after confronting the World Controller Mustapha Mond. Set in the year 632 After Ford, this novel ends with the suicide of John the Savage. For 15 points, name this dystopian novel by Aldous Huxley.

ANSWER: **Brave New World**

014-12-85-18123

BONUS: What Leonardo painting, set in a seaside grotto, depicts Mary, Jesus, John the Baptist, and an angel sitting together?

ANSWER: **Madonna of the Rocks** [or **Virgin of the Rocks**]

195-12-85-1810-1

24. While this case was in process, John Catron was urged by the President-elect to settle with the majority decision before his inauguration. The plaintiff argued about his trip with the Emerson family to what is now Wisconsin, though the defendant in this case was John Sanford. This case's seven to two opinion under Chief Justice Roger Taney annulled the Missouri Compromise. For 15 points, name this 1857 case that ruled that black people had no rights.

ANSWER: *Dred **Scott** v. John F.A. **Sandford*** [or Dred **Scott** decision; accept *John F.A. **Sandford** v. Dred **Scott*** before "Sandford" is read]

104-12-85-18124

BONUS: This is a calculation question. If $\sin^2 x = .64$, what is the cosine of x ?

ANSWER: **.6** [or **3/5**]

080-12-85-1810-1

25. Michelle Alexander wrote about the racist use of these places in her 2010 book *The New Jim Crow*. A simulation of these places put reflective sunglasses on a man nicknamed "John Wayne." Michel Foucault criticized the Panopticon design for these places, in which one person can see everyone else. A fake one was shut down after six days by Philip Zimbardo in an out-of-control Stanford hallway. For 15 points, name these institutions with guards and inmates.

ANSWER: **prisons** [or **jails**]

104-12-85-18125

BONUS: What diagram that contains the "main sequence" plots stars using two axes: luminosity, a stand-in for stellar brightness, and temperature, a stand-in for stellar color?

ANSWER: **HR** diagram [or **Hertzsprung-Russell** diagram]

104-12-85-1810-1



26. This author wrote about Joel Harrison Knox being sent to live with his father at Skully's Landing in *Other Voices, Other Rooms*. He is thought to have been the basis for Dill in *To Kill a Mockingbird* because of his friendship with Harper Lee. This author wrote a novel which follows the New York life of Holly Golightly, and he wrote about the real life murder of the Clutter family in another work. For 15 points, name this author of *Breakfast at Tiffany's* and *In Cold Blood*.

ANSWER: Truman **Capote** [or Truman Streckfus **Persons**]

015-12-85-18126

BONUS: What state's Indian-American governor, Nikki Haley, is tasked with replacing retiring senator Jim DeMint?

ANSWER: **South Carolina**

104-12-85-1810-1

27. A hormone secreted from this organ is responsible for triggering the formation of red blood cells; that hormone is erythropoietin. This organ contains balls of capillaries surrounded slit diaphragms and podocytes, which are responsible for keeping proteins from leaking out of the circulation. The functional unit of this organ contains a pair of convoluted tubules book-ending the Loop of Henle, and is called the nephron. This organ is responsible for maintaining salt balance. For 15 points, name this organ which produces urine.

ANSWER: **kidney**

048-12-85-18127