



1. Radios in this country issue notices of "ghost drivers" going against the direction of traffic. Its highways experience huge traffic jams called *staus*, which is the only time when drivers can pass on the right. This country uses a circular traffic sign with 4 diagonal lines from the bottom left to top right to signify the "end of all restrictions," meaning that there is a recommended top speed of 130 kilometers per hour, but no speed limit. For 15 points, name this country whose highways are called *autobahns*.

ANSWER: Federal Republic of **Germany** [or Bundesrepublik **Deutschland**]

080-12-85-04101

BONUS: What actor delivered the line, "When Gotham is ashes, you have my permission to die" as Bane in *The Dark Knight Rises*?

ANSWER: Edward Thomas **Hardy** [or Tom **Hardy**]

080-12-85-0410-1

2. The entropy of one of these objects is proportional to the third power of the speed of light and proportional to its area. They can be described by only mass, charge, and angular momentum according to the no-hair theorem. The Schwarzschild radius determines the event horizon of these objects. They are thought to emit Hawking radiation, and can be formed following the collapse of large stars. For 15 points, identify these very dense objects in space, from which light cannot escape.

ANSWER: **black holes**

189-12-85-04102

BONUS: What Tennessee city hosted the 1982 World's Fair and is the site of the main campus of the University of Tennessee?

ANSWER: **Knoxville**

030-12-85-0410-1

3. This man got his start working for Johnny Torrio. He commissioned a custom armored Cadillac, which was confiscated and later used to transport FDR. This man made his base in Cicero, Illinois. After extended conflict with the Bugs Moran's gang, this man ordered the St. Valentine's Day Massacre. He was sent to Alcatraz after being convicted of tax evasion in 1931. For 15 points, name this Chicago-area mobster and bootlegger who was known as "Scarface."

ANSWER: Alphonse **Capone**

015-12-85-04103

BONUS: What English physicist conducted a double-slit experiment demonstrating the wave-particle duality of light?

ANSWER: Thomas **Young**

079-12-85-0410-1

4. The earliest work of this type is often considered to be Jacopo Peri's *Dafne*, and Peri's *Euridice* is the earliest surviving one. Claudio Monteverdi's *L'Orfeo* is another important early one of these musical works. Modern examples of these musical works include Philip Glass's *Einstein on the Beach* and John Adams's *Nixon in China*. Mozart composed works of this type with both German and Italian libretti. For 15 points, name this type of musical drama, examples of which include Giacomo Puccini's *Madame Butterfly*.

ANSWER: **opera**

014-12-85-04104

BONUS: James George Frazer wrote what initially controversial work of comparative mythology and religion, which was titled for an object used by Aeneas to enter the underworld?

ANSWER: *The Golden Bough: A Study in Magic and Religion*

014-12-85-0410-1

5. This artist included a childlike depiction of the sun and four windmills in the background of his black and white sketch of *Don Quixote*. He was influenced by African masks in painting five prostitutes in *Les Femmes d'Alger*. Often credited with founding a movement with Georges Braque, he respectively painted *Boy with a Pipe* and *The Old Guitarist* during his “rose” and “blue” periods. For 15 points, name this Spanish painter who pioneered cubism with *Guernica*.

ANSWER: Pablo Picasso

015-12-85-04105

BONUS: What country experienced a literary Golden Age in which the plays of Lope de Vega and Calderon de la Barca were written?

ANSWER: Kingdom of Spain [or Reino de España]

014-12-85-0410-1

6. In one work by this man, the title character is replaced by a panther after failing to draw crowds by starving himself for a record period of time. In another of his stories, residents of the title institution have their sentences inscribed on their bodies by a torture and execution machine. This author of “A Hunger Artist” and “In the Penal Colony” also created a salesman named Gregor Samsa, who awakens to find he has become a giant insect. For 15 points, name this Czech-born author of “The Metamorphosis.”

ANSWER: Franz Kafka

014-12-85-04106

BONUS: Identify the novel by Arundhati Roy about the childhood of the twins Estha and Rahel, whose mother has a forbidden affair with the untouchable Velutha.

ANSWER: *The God of Small Things*

014-12-85-0410-1

7. In one novel by this author, gold cyanide vapors are inhaled by the photographer Jeremiah de Saint-Amour. In another of his novels, Remedios the Beauty ascends to heaven while folding a sheet. That novel, set in a fictional town first presented in *Leaf Storm* named Macondo, follows many men named Jose Arcadio and Aureliano in tracing the history of the Buendia (bwen-DEE-uh) family. For 15 points, name this magical realist Colombian author of *Love in the Time of Cholera* and *One Hundred Years of Solitude*.

ANSWER: Gabriel Garcia Marquez

014-12-85-04107

BONUS: What American author wrote about California pioneer life in “The Luck of Roaring Camp” and “The Outcasts of Poker Flat”?

ANSWER: Bret Harte

015-12-85-0410-1

8. This author was financially ruined by the poor sales of his *A Week on the Concord and Merrimack Rivers*. One of his works describes a game of hide and seek with a loon, an encounter with a French woodchopper, and a battle between red and black ants. He described his imprisonment after refusing to pay a poll tax in his essay “Civil Disobedience.” For 15 points, name this man who described planting beans and living in solitude by the title pond in *Walden*.

ANSWER: Henry David Thoreau

015-12-85-04108

BONUS: This is a 30-second calculation question. What is the intersection of the lines $y = 4 - 2x$ and $x + y = 2$?

ANSWER: **(2,0)** [or $x = 2$ and $y = 0$]

174-12-85-0410-1

9. One factor in the performance of this technology is the timing of the RAS and CAS signals. In smartphones, this technology is what is usually stacked on top of a SoC to make a PoP. This technology is composed of constantly refreshing capacitor containing cells. This computer component is based on the DDR family of standards and comes in physical DIMMs. Unlike SSDs or hard drives, this subsystem forgets its content when shutdown. For 15 points, name this computer component used to store active information and programs.

ANSWER: **DRAM** [or dynamic **random access memory**; prompt on partial answer]

001-12-85-04109

BONUS: This is a 30-second calculation question. What is the volume, in terms of pi, of a cylinder with base diameter and height each equal to six inches?

ANSWER: **54 pi cubic inches**

174-12-85-0410-1

10. With the giantess Jarnsaxa (yarn-SAX-uh), this god has children named Magni, Modi, and Thrud. This god is married to the golden haired fertility deity Sif. The *Prose Edda* relates the story his fishing trip being sabotaged by Hymir. He rides a chariot pulled by goats which regenerate after being eaten. At Ragnarok, he will kill and be killed by the Midgard Serpent. For 15 points, name this son of Odin, a Norse storm god who wields a hammer named Mjollnir (mee-YOL-near).

ANSWER: **Thor**

015-12-85-04110

BONUS: An important eyewitness account of the Great Fire of London is provided by what English government official's famous diary from the 1660s?

ANSWER: Samuel **Pepys**

014-12-85-0410-1

11. The most common method for doing this relies on ddNTP molecules which are fluorescent at four different wavelengths. Craig Venter developed another method for accomplishing this process, called the "shotgun method," which uses restriction enzymes to cut the parent material. Frederick Sanger invented the chain-termination method for this process. In 2000, the HGP announced that this process had been accomplished for human cells. For 15 points, name this process which involves finding the order of nucleotides in the genetic material.

ANSWER: **DNA sequencing** [or **deoxyribonucleic acid sequencing**; or same-knowledge equivalents]

190-12-85-04111

BONUS: Who was the English clergyman and chemist who wrote "Rational Christianity" and discovered nitrous oxide and oxygen?

ANSWER: Joseph **Priestley**

030-12-85-0410-1

12. The protagonist of this novel is impressed by the praise that the housekeeper Mrs. Reynolds bestows on her master while showing them his portrait. In this novel, after the absurd clergyman who will inherit the central family's property is rejected by the protagonist, he marries her friend Charlotte Lucas. The central family is almost scandalized when the soldier Wickham elopes with the youngest daughter, Lydia. At the end of this novel, Mr. Bingley marries Jane and Mr. Darcy marries Elizabeth. For 15 points, name this novel about the Bennet family by Jane Austen.

ANSWER: **Pride and Prejudice**

014-12-85-04112

BONUS: This is a 30-second calculation question. If A is a second-quadrant angle with sine equal to .6, what is the cosine of the angle two times A?

ANSWER: **0.28** [or **7/25**]

174-12-85-0410-1

13. Cancer of the cells producing this hormone can be treated with streptozotocin, and those cells release this hormone after the closing of a potassium channel. This hormone is activated after the cleaving off of a C-peptide, and it works by binding to a tyrosine kinase receptor. This hormone, released from the beta cells of the islets of Langerhans, promotes the synthesis of glycogen and accelerates glycolysis, and is typically released after a meal. For 15 points, name this pancreatic hormone that decreases blood sugar levels, which is deficient in diabetes.

ANSWER: **insulin**

048-12-85-04113

BONUS: This is a 30-second calculation question. Find the root mean square, also called the quadratic mean, of the set 1, 1, 2, 5, 7.

ANSWER: **4**

174-12-85-0410-1

14. During the Civil War, David Farragut moved past Fort Jackson and Fort St. Philip to capture this city. This city was governed for the rest of the war by Benjamin Butler. Homer Plessy was prosecuted for boarding a whites-only train car in this city. A group of pirates led by Jean Lafitte helped Andrew Jackson take this city in the final battle of the War of 1812. For 15 points, name this Southern city that was led by Mayor Ray Nagin when it was severely damaged by Hurricane Katrina.

ANSWER: **New Orleans**

015-12-85-04114

BONUS: The failed British bombardment of what Baltimore fort during the War of 1812 inspired Francis Scott Key to write the "Star-Spangled Banner?"

ANSWER: Fort **McHenry**

030-12-85-0410-1

15. A group of photographs of this battle known as the Magnificent Eleven were taken by Robert Capa. The earliest fighting in this battle occurred with Operation Deadstick, which used glider borne forces to capture a key pair of bridges. This battle was given the codename Operation Overlord, and began with coordinated amphibious assaults on beaches named Gold, Juno, Utah, Omaha, and Sword. For 15 points, name this Allied invasion of occupied France during World War II that began on D-Day.

ANSWER: **Normandy** Invasion [accept equivalent answers; accept Operation **Overlord** before mentioned; accept **D-Day** before mentioned]

015-12-85-04115

BONUS: Johann Strauss II was known as the “king” of what type of 3/4 dance popular in 19th-century Vienna?

ANSWER: **waltz**

014-12-85-0410-1

16. Lathe and Ruthven developed a version of this technique that uses a gel-bed that allows large particles through but retains small particles; that is the size-exclusion form. This technique comes in gas-liquid and thin-layer varieties, and most forms of this technique require the calculation of retention time. It typically utilizes a stationary phase and a mobile phase. This technique is sometimes performed in chemistry classes whilst utilizing a solvent along with a paper colored with markers. For 15 points, identify this technique which separates mixtures, whose name means "color-writing."

ANSWER: **chromatography** [accept early buzz of **size-exclusion** chromatography]

189-12-85-04116

BONUS: What geneticist developed the use of namesake "squares" to describe test crosses?

ANSWER: Reginald **Punnett**

080-12-85-0410-1

17. The narrator of one poem by this man notes that “On the faces of women and children I have seen the marks of wanton hunger.” This author of the *Rootabaga Stories* and a biography of Abraham Lincoln wrote about a phenomenon that “sits looking over harbor and city on silent hunches and then moves on.” In addition to writing that the fog “comes on little cat feet,” this poet described a city as “hog butcher for the world, tool maker, stacker of wheat.” For 15 points, name this author of “Chicago.”

ANSWER: Carl **Sandburg**

015-12-85-04117

BONUS: Dhofari, Saidi, and Juba are all forms of what language, which is usually taught in the “Modern Standard” version and is the majority tongue in over twenty-five countries?

ANSWER: **Arabic**

019-12-85-0410-1

18. This poet exclaimed “Flood-tide below me! I watch you face to face” in his poem “Crossing Brooklyn Ferry.” He asked, “And if the body were not the Soul, what is the Soul?” in “I Sing the Body Electric.” This poet, who served as a nurse during the Civil War, wrote “I am large, I contain multitudes” in a lengthy poem in which he sounds a "barbaric yawp." For 15 points, name this American poet who included “Song of Myself” in the many editions of his collection *Leaves of Grass*.

ANSWER: Walt **Whitman** [or Walter **Whitman**]

015-12-85-04118

BONUS: What painting by Grant Wood depicts a farmer holding a pitchfork and standing next to his wife?

ANSWER: **American Gothic**

015-12-85-0410-1

19. Phycobiliproteins confer this property on organisms. This adjective describes a spot indicating sign of Tay-Sachs disease on the retina. On a computer, the maximum value for this property alone is given by the Hex code #FF0000. Along shores, this property’s namesake “tides” are caused by algal blooms of this color. For 15 points, name this visual property of a multi-Earth-sized storm in Jupiter’s atmosphere known as this kind of “great” “spot”.

ANSWER: **redness** [or being **red**]

104-12-85-04119

BONUS: What conic section is the set of points such that the difference between their distances from two fixed points is constant?

ANSWER: a **hyperbola**

080-12-85-0410-1

20. This city was led by two kings at the same time, one from the Eurypontid line and one from the Agiad line. Much of its governance was handled by a group of five ephors. This city's agricultural needs were met by a slave-like class called helots. One king of this city was Leonidas, who fought the Persian army of Xerxes at Thermopylae with an army of only three hundred men. For 15 points, name this city that waged the Peloponnesian War against its less militant rival, Athens.

ANSWER: **Sparta** [or **Lacedaemon**]

015-12-85-04120

BONUS: Name the queen whose navy lost at the Battle of Actium and who was a lover of both Julius Caesar and Mark Antony.

ANSWER: **Cleopatra** VII Thea Philopater

015-12-85-0410-1

21. This compound is the simplest carbamide. In the body, it is produced in a cycle which uses three ATP molecules and produces the intermediate citrulline. Friedrich Wohler's synthesis of this compound disproved vitalism. This compound's structural formula is NH_2CONH_2 . It is produced principally in the liver to allow for a safe way to excrete nitrogenous waste. For 15 points, name this solid nitrogen-containing component of urine.

ANSWER: **urea**

190-12-85-04121

BONUS: Which holiday celebrated the Sunday before Easter commemorates Jesus's ride on a donkey?

ANSWER: **Palm Sunday**

015-12-85-0410-1

22. If this particle's electric dipole moment is nonzero, it would violate both parity and time reversal symmetry. Beryllium-5 undergoes a type of decay in which this particle is released, and this particle was originally discovered in an experiment in which paraffin wax was bombarded with them, performed by James Chadwick. Consisting of two down and one up quark, this particle has a mass of 1.008 atomic mass units. Changing the number of these particles results in a new isotope. For 15 points, name this particle found in the nucleus, the neutral counterpart of the proton.

ANSWER: **neutron**

048-12-85-04122

BONUS: This is a 30-second calculation question. An unfair coin is twice as likely to land tails as heads. If it is flipped three times, what is the probability of getting exactly one head?

ANSWER: **4/9** [or **12/27**]

174-12-85-0410-1

23. Men involved in the negotiation of this treaty included Johan Adler Salvius and Johann Krane, and the Duke of Mecklenburg ceded Wismar following this agreement. Count Maximilian von Trautmansdorff represented the Holy Roman Empire during the negotiations for this agreement, which consisted of two treaties signed at Munster and Osnabruck. Innocent X's "Zelo domus Dei" condemned this agreement, which reversed Ferdinand II's Edict of Restitution. This agreement re-affirmed the Peace of Augsburg. For 15 points, identify this 1648 treaty which ended the Thirty Years' War.

ANSWER: Peace of **Westphalia**

189-12-85-04123

BONUS: Name the eclectic French intellectual who philosophized about power dynamics in modern society through outwardly historical books such as *Madness and Civilization* and *The History of Sexuality*.

ANSWER: Michel **Foucault**

019-12-85-0410-1

24. A creature from the second game in this series speaks in rhymed couplets of trochaic heptameter and is named Gravemind. The first game in this series features a beach invasion on the level The Silent Cartographer and has the subtitle *Combat Evolved*. The main character in this series is assisted by Cortana, but he did not appear in the games *Reach* or *ODST*. For 15 points, name this game series in which humans fight the Flood and the Covenant with the help of Master Chief.

ANSWER: **Halo**

023-12-85-04124

BONUS: Eamon de Valera was the president and prime minister of what country that experienced the 1916 Easter Rising?

ANSWER: **Ireland** [or **Eire**]

030-12-85-0410-1

25. This river forms three sides of a rectangular loop named for the Ordos Desert; the fourth side of that loop is made by the Wei (WAY) River, which, with the Fen River, serves as this river's largest tributaries. This river ends in the Bohai Sea after traveling nearly 5,500 kilometers, which makes it the second-longest river in its country. For 15 points, loess (LESS) picked up by what Chinese River gives it its name and distinctive color?

ANSWER: **Yellow** River [or **Huang** He; or **Hwang** Ho]

023-12-85-04125

BONUS: What ragtime musician composed the "Maple Leaf Rag" and "The Entertainer"?

ANSWER: Scott **Joplin**

080-12-85-0410-1



26. This quantity is inversely proportional to the difference of the natural log of the inner and outer radii of a coaxial cable. For a sphere, this quantity is merely equal to the radius of the sphere. This quantity, which is usually proportional to the permittivity of a material, is added in parallel, unlike resistance. One-half this quantity times the square of the voltage gives the energy stored in this quantity's associated object, which often comes in a parallel-plate variety. For 15 points, name this quantity measured in farads.

ANSWER: capacitance

048-12-85-04126

BONUS: What molecular geometry occurs in complexes with six ligands and no lone pairs?

ANSWER: octahedral

048-12-85-0410-1

27. One of this author's poems begins, "Among the rain and lights I saw the figure 5 in gold." He used the title "Poem" for a work about a cat that stepped down "into the pit of the empty flowerpot." This author wrote "I have eaten the plums that were in the icebox" in his oft-parodied poem "This Is Just to Say." For 15 points, name this poet and pediatrician who wrote that "so much depends upon" the title object in "The Red Wheelbarrow."

ANSWER: William Carlos Williams

015-12-85-04127