



1. Columnar jointing is most commonly observed in this type of rock and has created structures like Devils Tower. Eclogite and greenschist are two end products of the metamorphism of this rock. The intrusive equivalent of this mafic rock is gabbro. A namesake type of this rock is formed at mid-ocean ridges, where it becomes part of the oceanic crust. For 10 points, identify this common igneous rock that forms the majority of the Earth's crust, along with granite.

ANSWER: **basalt** [or **gabbro** until "intrusive equivalent" is read; prompt on **igneous** rock]

066-13-90-11101

2. A collection of poetry written in memory of this poet by her husband is entitled *Birthday Letters*. This poet's collection *Ariel* includes "Lady Lazarus" as well as a poem in which she writes, "I have always been scared of you/With your Luftwaffe, your gobbledygoo," and tells the title character, "I'm through." In addition to that poem, "Daddy," this author wrote a novel in which Dr. Gordon administers electroconvulsive therapy on the protagonist, Esther Greenwood. For 10 points, name this poet who wrote the novel *The Bell Jar*.

ANSWER: Sylvia **Plath**

030-13-90-11102

3. The folia of this section of an organ include a layer of Purkinje cells. The ends of this region's granule cells receive input from mossy fibers. It lies dorsal to a region of the name whose name means "bridge", the pons, which connects the thalamus and brain stem. Ataxia indicates damage to this region that affects motor control. A surface with smooth grooves distinguishes it from the cerebral cortex. For 10 points, identify this region whose name means "little brain".

ANSWER: **cerebellum**

232-13-90-11103

4. Wolfram von Eschenbach claimed this object was a stone that fell from heaven during Lucifer's rebellion. The land where this object is kept was ruled by the Fisher King, who could only be healed upon the arrival of the son of his daughter Elaine. Galahad is the only knight pure enough to handle it. This object was brought to Britain by Joseph of Arimathea. For 10 points, name this cup containing the blood of Christ sought by King Arthur and his knights.

ANSWER: Holy **Grail**

121-13-90-11104

5. When these items have an efficiency factor "eta" that is lower than fifty percent, friction causes them to be self-locking. A type of this machine which can be used to bring water uphill for irrigation is named for Archimedes. This one of the six classical simple machines converts rotational to linear motion. For 10 points, name this machine which is commonly used as a fastener in either slotted or Phillips-head varieties.

ANSWER: **screw**

019-13-90-11105

6. This scientist formalized the mathematical treatment of kinematics in his *Two New Sciences*. After the publication of *Dialogue Concerning the Two Chief World Systems*, which compared the Copernican and Ptolemaic systems, this scientist was found "suspect of heresy" and put under house arrest. For 10 points, name this Italian scientist who improved the telescope and dropped two cannonballs with different masses from the Leaning Tower of Pisa.

ANSWER: **Galileo** Galilei [or Galileo **Galilei**]

066-13-90-11106

7. For a spring, this quantity is equal to the square root of the spring constant over mass. The angular form of this quantity is measured in radians per second and represented by omega. For a function of the form cosine of $b x$, b is this quantity. The velocity of a wave is equal to this quantity times wavelength. This quantity has units of inverse seconds, or Hertz, since it is the reciprocal of the period. For 10 points, identify this quantity that, for a statistical experiment, is the number of times an event occurs.

ANSWER: **frequency**

066-13-90-11107

8. "Regular" examples of these substances have deviations from ideality accounted for by the Margules function. If these substances have zero enthalpy of mixing, they are called ideal. The vapor pressure of one of these substances is equal to the vapor pressure of each component times its mole fraction according to Raoult's law. Precipitates form when their capacity is exceeded. For 10 points, name these substances which consist of some solute dissolved in a solvent.

ANSWER: **solution**

048-13-90-11108

9. In perfect competition, the curve for this quantity is the section of the marginal cost curve found above the minimum average variable cost. In the long run, the aggregate form of this quantity is perfectly vertical. A "shock" named for this quantity quickly moves the equilibrium price, as in the 1973 oil embargo. This quantity goes up with price in a traditional diagram. For 10 points, name this quantity which forms the equilibrium point where it meets demand.

ANSWER: **supply**

019-13-90-11109

10. This is the manner of death of a character who arrives late after thinking her husband is busy stacking wood. A woman dies in this manner at the hands of Old Man Warner and her own family while saying "It isn't fair, it isn't right." This is how Tessie Hutchinson dies in a story after drawing a paper with a black spot on it, apparently to save the town's crops. For 10 points, name this method of death which kills the "winner" of the title game in Shirley Jackson's story "The Lottery."

ANSWER: **stoning** [or **being hit with rocks** or other such descriptions]

052-13-90-11110

11. Cities lying on this sea include Turku and Sundeval. An island located in this sea contains the city of Visby. The Kattegat lies in the western portion of this sea; in its north, the Aland Islands lie to the south of the Gulf of Bothnia. In medieval Europe, ports on this sea formed an economic association called the Hanseatic League. For 10 points, name this sea in northern Europe, bounded by such countries as Estonia, Latvia, and Sweden.

ANSWER: **Baltic** Sea

080-13-90-11111

12. Charles Cheswick drowns himself in this work after the protagonist refuses to protest against cigarette rationing. “Rub-a-Dub” George Sorenson captains a ship on a fishing trip in this work, which sees a vote about watching the World Series. The narrator of this work has a belief in a machine called The Combine, and a group of characters in this novel are separated into the Acutes and the Chronics and are watched over by Nurse Ratched. For 10 points, name this novel in which Chief Bromden suffocates the lobotomized McMurphy and escapes from a mental hospital, a work of Ken Kesey.

ANSWER: *One Flew Over the Cuckoo’s Nest*

030-13-90-11112

13. A multi-volume biography of this president was written by Robert Caro. This man was known as “Landslide” after barely winning a possibly fraudulent primary against Coke Stevenson. He announced he would not run for re-election after barely defeating Eugene McCarthy in the New Hampshire primary. This man used the “Daisy” commercial to defeat Barry Goldwater in an election. For 10 points, name this president who initiated the Great Society and who succeeded the assassinated John F. Kennedy.

ANSWER: Lyndon Baines Johnson [or LBJ; prompt on Johnson]

052-13-90-11113

14. It’s not in the Middle East, but a city on this river that played a key role in the Civil War was called “Bagdad.” The Elephant Butte Dam is located on it near the amusingly named city of “Truth or Consequences.” This river’s international distinction was opposed by a country which cited the Nueces River as the border. Ciudad Juarez and El Paso are on this river. For 10 points, name this river which serves as a natural border between the United States and Mexico.

ANSWER: Rio Grande [or Rio Bravo del Norte]

052-13-90-11114

15. This type of literature was addressed to “Miss Nobody” and was written by Frances Burney. A famous author of this type of book was the Chief Secretary to the Admiralty under Charles II. Samuel Pepys (Peeps) wrote one of these in the 1600’s, describing things like the Great Fire of London. After World War II, Otto Frank edited his daughter’s type of this book describing life hiding from the Nazis. For 10 points, name this literary genre in which the author writes about his or her daily activities.

ANSWER: diary [or journal]

052-13-90-11115



1A. What anion with charge minus 3 is bonded to calcium and OH in hydroxyapatite, a component of bone?

ANSWER: **phosphate** [or **PO4 3 minus**]

1B. What Brit who was an original judge on *American Idol* went on to create *The X Factor* and *America's Got Talent*?

ANSWER: Simon Phillip **Cowell**

2A. What American composer collaborated with Jerome Robbins and Stephen Sondheim on *West Side Story* and was the conductor of the New York Philharmonic?

ANSWER: Leonard **Bernstein**

2B. The arithmetic logic unit is a component in what "brain" of a computer?

ANSWER: **CPU** [computer **processor**; or **central processing unit**; or **central processor unit**]

3A. This is a 20-second calculation question. What is the area of a square that has one side formed from the diameter of a circle with an area of 13 pi square units? Express your answer in simplest form.

ANSWER: **52** square units

3B. This is a 20-second calculation question. What is the value of sine of x times cosine of x, where x equals 22.5 degrees?

ANSWER: the square **root** of **2, over 4** [or **radical 2, over 4**]

4A. What country served as part of a dual monarchy with Austria from 1867 until the end of World War I?

ANSWER: **Hungary** [or **Magyarország**]

4B. Name the former minister of Health and Ageing who became Prime Minister following the September Australian national election.

ANSWER: Tony **Abbott** [or Anthony John "Tony" **Abbott**]

5A. What vice-president to George H.W. Bush was zinged by Lloyd Bentsen after alluding to JFK in a debate?

ANSWER: Dan **Quayle**

5B. What Chinese author of *The Republic of Wine* and *Red Sorghum* won the 2012 Nobel Prize in Literature?

ANSWER: **Mo** Yan

6A. What representation of a function as an infinite sum of terms is called the Maclaurin series when it is centered at zero?

ANSWER: **Taylor** series

6B. Who was the leader of the Free French during World War II who served as president of France after founding the Fifth Republic in 1958?

ANSWER: Charles **de Gaulle**

7A. What 1962 Rachel Carson book argued that DDT and other pesticides destroy the ecosystem?

ANSWER: **Silent Spring**

7B. What creature was ridden by Bellerophon to defeat the Chimera and in a failed attempt to reach Mount Olympus?

ANSWER: Pegasus

8A. What left fielder for the Milwaukee Brewers was the NL MVP in 2011 and was suspended in July 2013 for violating MLB's performance enhancing drug policy?

ANSWER: Ryan Braun

8B. What Italian term refers to extremely contrasted light and dark, such as in the paintings of Caravaggio?

ANSWER: chiaroscuro

9A. This is a 30-second calculation question. Including the empty set and the set itself, how many subsets does a set of five distinct objects have?

ANSWER: 32

9B. This is a 30-second calculation question. If you randomly rearrange the letters of the word "permutation," what is the probability that the first three letters are all vowels?

ANSWER: 60/990 [or 2/33]

10A. What African country's Tutsi population was targeted by Hutus during a 1994 genocide?

ANSWER: Republic of Rwanda [or Republika y'u Rwanda]

10B. The Millikan oil drop experiment quantified the charge of what particle whose loss or gain during a chemical reaction is quantified by the oxidation number?

ANSWER: electrons



1. The use of the code name "Geronimo" during this event was criticized by American Indian groups. A photograph taken during this event shows Hillary Clinton holding her right hand over her mouth while sitting in the White House Situation Room. Several Muslim leaders criticized a body being buried at sea after this event. Code-named Operation Neptune Spear, it took place near Abbottabad, Pakistan. For 10 points, name this 2011 action perpetrated by SEAL Team Six that killed the founder of al-Qaeda.

ANSWER: death of Osama bin Laden [or death of Osama; or Operation Neptune Spear until it is read; accept synonyms for death]

052-13-90-11117

2. On this day, the wearing of leather shoes is not permitted. One prayer said on this day includes a list of things starting with each letter of the alphabet. The *Kol Nidre* is recited at the beginning of this holiday, the later of the two during which the shofar is blown. This holiday occurs on the 10th day of Tishrei, nine days after the New Year. For 10 points, identify this fast day, the Jewish day of atonement.

ANSWER: Yom Kippur

233-13-90-11118

3. This scientist is the second namesake of a state of matter first demonstrated when rubidium atoms were cooled to near absolute zero. That state of matter is a "condensate" he names with Bose. This physicist applied the kinetic theory of heat to the Brownian motion of particles in one of his *Annus Mirabilis* papers. He also described an effect in which electrons are emitted from metals in response to incoming light. For 10 points, name this brilliant German physicist who won the Nobel for his work on the photoelectric effect.

ANSWER: Albert Einstein

066-13-90-11119

4. This animal is known as a "marjara" in Sanskrit, and a "paka" in Swahili. In French, this animal's handwriting is synonymous with bad penmanship, and this animal names the game of tag. The family name of Mao Zedong is one tone away from this animal's name in Mandarin. Latin refers to it as a "felis," the ancestor of a general name for animals of this type. For 10 points, identify this type of animal which is known in Spanish as a "gato."

ANSWER: a housecat

019-13-90-11120

5. An adjustable one of these devices is called a potentiometer. Three of these devices with known values are used to find an unknown value for a fourth in a Wheatstone bridge. The amount of power dissipated by these devices is equal to voltage times current and they add in series. These devices are represented with a zig-zag line and their rating is indicated with colored bands. For 10 points, identify these simple circuit devices paired with capacitors and inductors.

ANSWER: resistors

066-13-90-11121

6. In September 2013, this man cancelled several high-priced speaking engagements with CitiGroup, as he vied for an appointed office with Janet Yellen. In a prior post, this man was criticized for claiming that women are biologically incapable of succeeding at math and science. For 10 points, name this former president of Harvard University who was the Treasury Secretary under Clinton and, in September 2013, withdrew as a candidate for head of the Federal Reserve.

ANSWER: Lawrence "Larry" **Summers**

019-13-90-11122

7. This author coined a term meaning "sweet new style" for his literary movement. In one of his poems, he describes himself as "halfway along life's path" and visits a location featuring ten circular ditches called Malebolge. The poems of his *Vita Nuova* are dedicated to Beatrice Portinari, who takes over for Virgil as his guide in another of his poems. For 10 points, name this Italian poet who divided his *Divine Comedy* into the *Paradiso*, the *Purgatorio*, and the *Inferno*.

ANSWER: **Dante** Alighieri [or Dante **Alighieri**; or Durante degli **Alighieri**]

029-13-90-11123

8. This country ran a colony mapped in the Castello Plan. It's not England, but it employed an explorer who used the ship *Half Moon* and was named Henry Hudson. This country mythically purchased an island from American Indians for 24 dollars worth of beads. Its agents included Peter Minuit and Peter Stuyvesant. In 1674, this country lost a colony to England that became New York. For 10 points, name this European country that maintained the colony of New Amsterdam.

ANSWER: **Netherlands** [or **Dutch** Republic; or Republic of the Seven United **Netherlands**; or Republic of the **Seven United Provinces**; or **Holland**]

052-13-90-11124

9. The fugacity coefficient is equal to the fugacity divided by this variable. Increasing this variable favors the side of a reaction with fewer moles according to Le Chatelier's principle. This variable is added to n squared over v squared times a in order to correct for attraction between particles in the van der Waals equation, and it is inversely proportional to volume according to Boyle's Law. For 10 points, name this quantity measured in Pascals and atmospheres.

ANSWER: **pressure** [or **P**]

048-13-90-11125

10. This artist created a piece that was just a ripe banana, which was used on the cover of the album *The Velvet Underground and Nico*. In a piece by this artist, the title people stand with legs spread wide and a gun pointed at the viewer. This artist of *Eight Elvises* was shot by Valerie Solanas in 1968 and created a piece consisting of thirty-two canvases depicting different cans of Campbell's Soup. For 10 points, name this American artist who often mass produced his Pop Art.

ANSWER: Andy **Warhol** [or Andrew **Warhola**]

023-13-90-11126

11. This poem begins with an evocation of the spirit "that on the secret top of Oreb, or of Sinai, didst inspire that shepherd, who first taught the chosen seed." The middle books of this poem include lengthy narrations of past events by Raphael, who visits the protagonists in a garden. In the first book of this poem, Satan rallies his defeated forces in Hell before flying to Eden. For 10 points, name this epic poem about the fall of Adam and Eve written by John Milton.

ANSWER: **Paradise Lost**

014-13-90-11127

12. In this book, the protagonist's half-brother dies in a hunting accident and is named Rob Roy. The title character gets a loose nail in his shoe, which eventually leads to the fatal accident of Reuben Smith. At the end of this novel, the cab owner Mr. Skinner wants to send the protagonist to a knacker. This was the only book written by a woman who wanted to induce kinder treatment of animals and it led to the abolition of the "bearing rein." For 10 points, name this Anna Sewell novel narrated by the title horse.

ANSWER: **Black Beauty**

052-13-90-11128

13. One of these buildings was destroyed when an inhabitant's electricity interacted with the gas produced by Koffing. A Wireless Club and Union Room were included on the second floor of these buildings starting in Generation III. One of them located in Viridian City is attacked by Meowth, Jessie, and James. Brock's love interest works in these locations and is named Nurse Joy. For 10 points, identify these locations which heal injured Pokemon.

ANSWER: **Pokemon centers**

233-13-90-11129

14. Robert Schumann wrote four compositions of this type, including ones nicknamed "Rhenish" and "Spring." Gustav Mahler refused to classify his *Das Lied von der Erde* as one of these compositions. One of this type of composition takes its text from the poem "Ode to Joy," and the same composer wrote one of these compositions nicknamed "Pastoral." For 10 points, Beethoven wrote nine of what type of extended orchestral composition with multiple movements?

ANSWER: **symphony**

140-13-90-11130

15. This body of water contains the islands Cres and Krk. Bari, Dubrovnik, and Rimini are cities that lie on this sea, which also contains the Bay of Kotor. The Strait of Otranto connects this sea to the Ionian Sea. Brundisium was a Roman naval port on this sea. The most populous modern-day cities that lie on this sea include Split, Trieste, and Venice. For 10 points, name this sea that lies between Italy and the Balkan Peninsula.

ANSWER: **Adriatic** Sea

153-13-90-11131



1. This person's father starved a group of rebelling mercenaries in a saw-shaped canyon. This person won a battle in which he ambushed an army marching along a lakeshore, and was opposed by a general nicknamed "the Delayer." In another battle, this man used double envelopment to defeat Varro, and he eventually lost at Zama. He led a march across the Alps to attack Italy, and was later defeated by Scipio Africanus. For 10 points, name this son of Hamilcar who led Carthage in the Second Punic War.

ANSWER: Hannibal Barca

232-13-90-11132

2. In a poem by this man, one of the protagonists slays the dragon holding Una's parents hostage and is seduced by the witch Duessa. This poet described his courtship of Elizabeth Boyle in his sonnet sequence *Amoretti*, to which he appended a famous "Epithalamion." In his longest poem, Britomart, Guyon, and the Redcrosse Knight are among the servants of the title character, Gloriana. For 10 points, name this Elizabethan poet of *The Faerie Queene*.

ANSWER: Edmund Spenser

014-13-90-11133

3. During a trial in this novel, Thomas Perez testifies that he cannot remember whether or not a character cried at a funeral, though he did definitely drink coffee and smoke. This novel's title character is initially disappointed that his incarceration prevents him from visiting Marie Cardona or his friend Raymond Sintes. The protagonist of this novel is executed after remorselessly shooting an Arab. For 10 points, identify this novel about the foreigner Meursault, written by Albert Camus.

ANSWER: The Stranger [or L'etranger]

233-13-90-11134

4. An extract from this organ is added to a solution of Salmonella typhimurium and a test compound in the Ames test. This organ can undergo fulminant necrosis in people overdosing on acetaminophen. This organ's namesake cells are often bi-nucleated, and this organ is responsible for producing a substance that emulsifies lipids. This organ's functional unit is the portal triad, and it is responsible for detoxification and bile production. For 10 points, name this organ destroyed in cirrhosis and hepatitis.

ANSWER: liver

048-13-90-11135

5. This organelle includes several enzymes that make up the carnitine shuttle, which begins the process of beta-oxidation. Chemiosmosis is used to create a proton motive force in this organelle. Malate is converted to aspartate after being brought into this organelle's matrix, and its inner surface area is increased by its cristae. Only the mother passes on this organelle's DNA on to offspring. For 10 points, name this organelle in which the Krebs cycle generates ATP.

ANSWER: mitochondria [or mitochondrion]

232-13-90-11136

An Atwood's machine involves two weights, a rope, and what type of simple machine, multiple of which are found in a block and tackle?

ANSWER: pulleys

This is a calculation question. If you flip six fair coins, what is the probability that the number of heads minus the number of tails is an odd number?

ANSWER: 0