



1. Pneumatophores are extensions of these structures used for aeration in some species that grown in swamps. The quiescent center of the meristem of these structures contains slowly-dividing cells. Lateral ones can arise from the pericycle, and the radicle is an embryonic example of these structures. The tips of these structures have gravity-sensing statocytes and have a cap that ensures they grow in a straight line. For 10 points, name these structures that absorb nutrients and anchor plants to the soil.

ANSWER: roots

048-13-90-13101

2. During this war, Wake Island was captured without bloodshed and a mock-battle was staged to hand over one city to prevent it from falling into the hands of Emilio Aguinaldo, a Filipino resistance leader. One key battle in this war at San Juan Hill was won thanks to the efforts of Theodore Roosevelt's Rough Riders. For 10 points, name this war in which the United States gained possession of the Philippines and liberated Cuba from their colonial overlord.

ANSWER: Spanish-American War

153-13-90-13102

3. The principle of inclusion-exclusion helps do arithmetic with certain functions that take more than two of these things as inputs. These entities are the inputs into the Cartesian product function. One formulation of Russell's "barber paradox" asks about the class of all of these constructs which are not a member of themselves. The elements that two of these things have in common is called their intersection. For 10 points, give this term for a collection of distinct objects.

ANSWER: sets

233-13-90-13103

4. This author wrote about the torment of the washerwoman Nancy in "That Evening Sun," in which he introduced a character whose conversation with the roommate Shreve provides the frame story for a novel in which a man marries Rosa Coldfield after the death of his first wife, her sister. In another novel by this author, the cook Dilsey, the alcoholic lawyer Jason, the aforementioned Harvard student Quentin, and the mentally challenged Benjy all narrate. Another of his novels is about Thomas Sutpen. For 10 points, name this Southern author of *The Sound and the Fury* and *Absalom! Absalom!*

ANSWER: William Cuthbert Faulkner

020-13-90-13104

5. This poem's speaker urges, "Let us roll all our strength, and all our sweetness up into one ball." This poem's second stanza begins by noting how "at my back I always hear Time's winged chariot hurrying near." This poem concludes that "though we cannot make our sun stand still, yet we will make him run." This poem begins, "Had we but world enough, and time, this coyness, lady, were no crime." For 10 points, name this seduction poem written by Andrew Marvell.

ANSWER: "To His Coy Mistress"

014-13-90-13105

6. The largest popcorn festival in the world is held in this state. This state was where the devastating “Anna Earthquake” hit in 1937. Along with its western neighbor, it is the site of the Great Black Swamp, which once formed Glacial Lake Maumee. This state’s greatest natural disaster resulted from flooding of the Great Miami River. The Toledo War changed this state’s border with Michigan. For 10 points, name this “Buckeye State.”

ANSWER: **Ohio**

052-13-90-13106

7. When using these proteins in the wrong buffer, they can catalyze nonspecific star activity. Their activity is inhibited by dam and dcm methylases. They recognize palindromic sites, and are used upon both a vector and insert during standard cloning. They are often used to distinguish alleles by using their namesake fragment length polymorphisms. Examples of them include EcoRI and BamHI, and they can leave blunt or sticky ends. For 10 points, name these enzymes that cut DNA at specific sites.

ANSWER: **restriction** enzymes [or **restriction** endonucleases]

048-13-90-13107

8. When looking at a Turner painting, this character says it looks like a “bloody big ship.” During a game of word association, he says “employment” after hearing the word “murder.” He mourns the loss of his lover, the traitorous Vesper Lynd, and his ancestral estate in Scotland is besieged by Raul Silva. This character is the protagonist of the films *Quantum of Solace* and *Skyfall*. For 10 points, name this British secret agent code-named 007 (double oh-seven).

ANSWER: James **Bond** [or **James** Bond; or **007** until it is read]

052-13-90-13108

9. The last line of dialogue in this story is “And now suppose you put the chops on.” A female character visits Madame Sofronie to raise money because all she has is one dollar and eighty seven cents. At the end of this story, James Dillingham Young realizes Della sold her hair to purchase a platinum watch chain. For 10 points, name this short story by O. Henry in which a couple give up prized possessions to buy Christmas presents they can no longer use.

ANSWER: "The **Gift of the Magi**"

052-13-90-13109

10. One of these objects contains the crater Rheasilvia, which has the largest mountain in the Solar System, and is Vesta. A type of these objects orbits sixty degrees in front of and behind the larger body in a three-body system, at the L4 and L5 Lagrangian points, and are called Trojans. The largest known one of these objects is Ceres. For 10 points, name these objects found in a "belt" between Mars and Jupiter.

ANSWER: **asteroids** [do not accept "dwarf planet"]

066-13-90-13110

11. In humans, this substance binds to the protein gc-globulin. The two most common forms of this substance in humans are ergocalciferol and cholecalciferol. A deficiency in phosphorus, calcium, or this substance can cause osteomalacia in adults, while cod liver oil was once commonly given to children to prevent a deficiency in this vitamin, which can cause rickets. For 10 points, identify this vitamin which is synthesized in the human skin by exposure to sunlight.

ANSWER: Vitamin **D**

029-13-90-13111

12. The protagonist of one of this man's novels is kidnapped in Brazil by Mr. Todd, who forces him to read Dickens aloud. Brenda marries Jock Grant-Menzies after Tony Last is declared dead in his novel *A Handful of Dust*. A teddy bear named Aloysius is owned by this author's character Sebastian Flyte, a member of the Catholic Marchmain family, who are visited at the title estate by Charles Ryder in this man's most famous novel. For 10 points, identify this English novelist who wrote *Brideshead Revisited*.

ANSWER: Evelyn **Waugh** [or Arthur Evelyn St. John **Waugh**]

029-13-90-13112

13. This scientist incorrectly proposed that DNA had a triple helix structure. This scientist proposed a polypeptide structure that makes a complete turn every 3.6 amino acids; that structure is the alpha helix. This scientist created a scale that ranges from 0.7 to 4.0 for francium to fluorine and that quantifies the ability of an atom to attract electrons. For 10 points, identify this scientist who originated the concept of electronegativity and won both a Chemistry and Peace Nobel.

ANSWER: Linus **Pauling**

066-13-90-13113

14. One of this poet's works describes an insect that "sucked me first, and now sucks thee," as a metaphor for sex. In another poem, he wished to part from his lover "as virtuous men pass mildly away, and whisper to their souls to go." In the tenth of his *Holy Sonnets*, he told the central figure that "poppy, or charms can make us sleep as well." For 10 points, name this metaphysical poet of "The Flea," "A Valediction Forbidding Mourning," and "Death, be not proud."

ANSWER: John **Donne**

014-13-90-13114

15. During this war, Soviet pilots secretly patrolled MiG Alley. A nominally volunteer force made a successful attack at the Yalu River during this war. Near the start of this war, a defensive perimeter was made at Pusan. A landing at Inchon that turned the tide in this war was planned by Douglas MacArthur, who was later sacked. For 10 points, name this war between a United States-led United Nations coalition and the forces of Kim Il-sung.

ANSWER: **Korean** War

153-13-90-13115



1A. Two angles are said to have what property if they sum to ninety degrees?

ANSWER: they are **complementary** angles [or word forms, such as they are **complements**]

1B. What composer of the opera *Eugene Onegin* also wrote a commemorative overture that uses a cannon?

ANSWER: Pyotr Ilyich **Tchaikovsky**

2A. What Mexican immigrant founded the United Farm Workers with Dolores Huerta and led a march of striking grape-workers to Sacramento?

ANSWER: Cesar **Chavez**

2B. In what play by Aristophanes do Tereus, Pisthetairos, and Eulepides create a perfect city in the sky named Cloudcuckooland?

ANSWER: **The Birds**

3A. This is a 20-second calculation question. Find the roots of the polynomial given by $x^2 + x - 6$.

ANSWER: $x = \underline{-3}$ and $x = \underline{2}$ [accept in any order; do not prompt on partial answer]

3B. This is a 20-second calculation question. If secant x equals $5/3$, what is the absolute value of cosecant x ?

ANSWER: **5/4**

4A. What god was murdered by his brother Set and eventually brought back to life by his wife Isis?

ANSWER: **Osiris** [or **Usir**]

4B. What type of motion, characterized by extreme sensitivity to starting conditions, is exhibited by a double pendulum?

ANSWER: **chaos** [or **chaotic** motion]

5A. What painting by Jacques-Louis David shows three soldiers raising their hands toward the three swords held by a bearded man?

ANSWER: **Oath of the Horatii** [or *Le Serment des Horaces*]

5B. In the 1980s, what rival of the Lakers had players Kevin McHale, Robert Parrish, and Larry Bird?

ANSWER: **Boston** Celtics [or Boston **Celtics**]

6A. What language that is the basis for Modern Standard Chinese is also the most common native language in the world?

ANSWER: **Mandarin** [or **Northern** Chinese; or **Guanhua**]

6B. Charles VI issued the Pragmatic Sanction of 1713 to try and secure the rule of what daughter, who was challenged by the War of the Austrian Succession?

ANSWER: **Maria Theresa** [or **Maria Theresia**]

7A. What painting by Raphael shows a discussion between Plato and Aristotle while surrounded by distinguished thinkers in the title institution?

ANSWER: **School of Athens**

7B. What novel featuring Ras the Exhorter and the Battle Royal was written by Ralph Ellison?

ANSWER: **Invisible Man**

8A. What country singer performed the song "Friends in Low Places" and created the rock alter ego Chris Gaines?

ANSWER: Garth **Brooks**

8B. The fallout from failed Operation Fast and Furious proved problematic for what current US Attorney General?

ANSWER: Eric **Holder**

9A. This is a 30-second calculation question. If three cards are dealt from a standard deck of playing cards, what is the probability they are all the same rank?

ANSWER: **1/425** [or **6/2550**]

9B. This is a 30-second calculation question. A cone with point facing upwards, is filled to half its height with water. What fraction of the volume is occupied by the water?

ANSWER: **7/8**

10A. What medieval Islamic polymath wrote *The Book of Healing* and *The Canon of Medicine*, the standard medicinal reference for over 600 years.

ANSWER: **Avicenna** [or Abu 'Ali al-Husayn ibn 'Abd Allah **ibn Sina**]

10B. What Canterbury Tale features a fox that captures the rooster Chanticleer by flattering him?

ANSWER: "**Nun's Priest Tale**"



1. One of this composer's pieces uses long notes played by the entire string section of the orchestra accompanying recitatives in order to create a "halo" surrounding the words of Christ. This composer wrote a set of six concertos as a job application to Christian Ludwig. This composer of the *St. Matthew's Passion* and *Brandenburg Concertos* also wrote a prelude and fugue in all 24 major and minor keys in another collection. For 10 points, name this German composer of *The Well-Tempered Clavier*.

ANSWER: Johann Sebastian **Bach**

186-13-90-13117

2. "Spreads" of cells in this phase can be treated with Giemsa stain or Quinacrine. This phase ends when securin is ubiquitinated and degraded, releasing separase. Cells are synchronized in this phase using nocodazole in order to karyotype them. During this stage, which accounts for about 4% of M phase, kinetochores attach to the spindle apparatus, and the chromosomes line up in the center of the cell. For 10 points, name this phase of mitosis that comes immediately before anaphase.

ANSWER: **metaphase**

048-13-90-13118

3. During this war, Emily Hobhouse was responsible for bringing attention to poor conditions in the English concentration camps. A series of English losses in this war occurred during the Black Week. Robert Baden-Powell successfully held out in this war during the Siege of Mafeking. During this war, Martinus Steyn and Paul Kruger led the Transvaal Republic and Orange Free State. For 10 points, name this war fought from 1899 to 1902 against Afrikaners in South Africa.

ANSWER: Second **Boer** War [or Anglo-**Boer** War; accept **South African** War before "South Africa"]

023-13-90-13119

4. In this city, Matthew Lyon grabbed tongs from a fire pit in order to defend himself from an attack by Roger Griswold. It was where a man mocked Andrew Butler by saying he worshiped the "harlot" slavery. This city was where Preston Brooks took revenge on the Massachusetts politician who delivered the "Crime Against Kansas" speech. For 10 points, name this city where Charles Sumner was viciously attacked with a cane on the floor of the U.S. Senate.

ANSWER: **Washington**, D.C. [or **District of Columbia**]

052-13-90-13120

5. The Hadley, Ferrel and polar cell regions are found in this layer of the atmosphere. This is the thinnest layer of the atmosphere for which the lapse rate is negative. Jet streams occur in the upper part of this layer of the atmosphere. The classic anvil shape of cumulonimbus clouds is due to the barrier between this layer and the one above it, and it is where most weather occurs. For 10 points, identify this lowest layer of the atmosphere that is found below the stratosphere.

ANSWER: **troposphere**

066-13-90-13121

6. This religion celebrates those who have reached the age of 20 on "Adults' Day." Wands with strips of paper attached are used in its purification rituals, or *harae*. The souls of dead soldiers, including war criminals, are worshiped as deities at its "peaceful country" temple. *Torii* are the gates that lead to this religion's shrines, where adherents worship *kami*. For 10 points, name this indigenous religion of Japan.

ANSWER: **Shintoism**

080-13-90-13122

7. This man recently wrote that “it is extremely dangerous to encourage people to see themselves as exceptional” in objecting to the term "American exceptionalism." He was described as “Batman” in diplomatic cables, and he cited “insufficient communication” as a reason why he chose to communicate directly with the American people. The *New York Times* published his “plea for caution” regarding the crisis in Syria. For 10 points, name this president of Russia.

ANSWER: Vladimir **Putin**

052-13-90-13123

8. At this point, both the first and second derivatives of pressure with respect to volume are equal to zero. Reduced temperatures and pressures are calculated as ratios to temperature and pressure at this point, which is at the upper-right on PT phase diagrams. Beyond this point, the heat of vaporization goes to zero because it is impossible to distinguish between gases and liquids. For 10 points, name this point at which phase boundaries disappear at high temperature and pressure.

ANSWER: **critical** point [or **supercritical** fluids]

190-13-90-13124

9. A creature of this type abducted the third son of Troas. That abduction by this type of animal was committed by Jupiter in order to have Ganymede as his cupbearer. Another creature of this type, described instead as a vulture in some versions, made a daily visit to Mount Caucasus to feed on a constantly regenerating liver. This type of creature was used to punish Prometheus. For 10 points, name this type of bird that had its head, wings, and talons make up the non-lion parts of a griffin.

ANSWER: **eagles** [prompt on **birds**]

023-13-90-13125

10. These things are said to have side effects when they modify a state. In object-oriented programming, when these things are part of a class, they are called methods. Passing by value and by reference are two methods of supplying arguments to these things. Variables declared inside them only have local scope. The keyword return terminates these things. For 10 points, identify these subsections of a computer program that perform a specific task.

ANSWER: **functions** [or sub**routines**; or **procedures**; or **subprograms**; or **expressions**; or **methods** until it is read; prompt on **block**]

066-13-90-13126

11. Writers using this language formed such literary movements as the Generation of '98 and the Generation of '27. The author of *Hopscotch* used this language, many of whose 20th-century writers came to prominence in the literary “Boom.” This language was used by the author of *Love in the Time of Cholera* and *One Hundred Years of Solitude*. For 10 points, name this language used by Gabriel Garcia Marquez.

ANSWER: **Spanish**

014-13-90-13127

12. The term "Peranakan" is used for descendants of immigrants to this country. This country's tribal indigenous population is called the Orang Asli, or "original people." The Kadazan people revere the highest point in this country, Mount Kinabalu. The eastern half of this country consists of the states Sabah and Sarawak. Its "peninsular" half borders Thailand to the north and Singapore to the south. For 10 points, name this country in Southeast Asia that controls half the island of Borneo.

ANSWER: **Malaysia**

080-13-90-13128

13. A phrase from this language meaning " "Good health to you now and forever" was inscribed on the *Voyager* record. This language is spoken by twenty percent of the population of an area that this language refers to as "Cymru" (CHIM-roo). Along with English and Scottish Gaelic, this is one of the three languages which one can claim proficiency in to become a citizen of the United Kingdom. For 10 points, identify this Celtic language whose lengthy place names are often seen around Cardiff.

ANSWER: **Welsh** language [or **Cymraeg** until "Cymru" is read]

019-13-90-13129

14. Alexios I Komnenos restored this empire to glory after it suffered a huge defeat at the Battle of Manzikert. One ruler of this empire earned an epithet after subjugating Bulgaria to his rule. Another emperor faced the Nika revolts and was supported by generals named Narses and Belisarius. This empire's downfall came in 1453, when the Ottoman Empire captured Constantinople. For 10 points, name this empire, which formed out of the Eastern Roman Empire.

ANSWER: **Byzantine** Empire

140-13-90-13130

15. Stan Patras created the "merry" one of these places in Romania, known for its gaudy decorations. The "Magnificent Seven" of these places in London include the one-time site of a vampire hunt, Highgate. One of these locations in Paris contains the Communards' Wall and is named after Louis XIV's confessor; that one, which honors Jim Morrison, Frederic Chopin, and Peter Abelard, is Pere Lachaise. For 10 points, name these locations where the dead are buried.

ANSWER: **cemeteries** [or **graveyards**]

080-13-90-13131



1. In Celsius, this integer is closest to the temperature at the triple point of water. A law designated by this number states that two systems in thermal equilibrium with a third system will be in thermal equilibrium with each other. The Third Law of Thermodynamics sets the entropy of a pure crystal to be this value when absolute temperature also takes on this value. For 10 points, name this number, the lowest possible value for a Kelvin temperature.

ANSWER: zero

190-13-90-13132

2. The protagonist of this novel sits between her husband and her future lover at a performance of Donizetti's opera *Lucia di Lammermoor*. The protagonist of this novel becomes desperately indebted to the merchant Monsieur Lheureux. Leon Dupuis has a tryst with this novel's protagonist after Rodolphe Boulanger. For 10 points, name this novel about Emma, the adulterous wife of a country doctor, written by Gustave Flaubert.

ANSWER: Madame Bovary

014-13-90-13133

3. QED accurately predicted that these particles have a g-factor slightly above 2, and in solids these particles are said to occupy bands. These particles were fired at a nickel target to show that they have wavelike character in the Davisson-Germer experiment. The existence of these particles was first demonstrated using a Crookes tube by JJ Thomson, who determined that these particles comprise cathode rays. For 10 points, name these small negatively-charged particles that orbit the nucleus.

ANSWER: electron

048-13-90-13134

4. During this war, Juan Negrin served as the prime minister for the government of one side, which was supported by American volunteers serving in the Abraham Lincoln Brigade. Early on in this war, Jose Antonio Primo de Rivera was executed. The Condor Legion was responsible for the bombing of Guernica during this war, in which Germany supported the Nationalists against the Soviet-supported Republicans. For 10 points, name this war that brought Francisco Franco to power.

ANSWER: Spanish Civil War

023-13-90-13135

5. This book includes a conversation with a poet in the section "Brute Neighbors." Sections of this book include "Where I Lived, and What I Lived For," and he describes his hobbies in a chapter called "The Bean Field." The author goes to the title location "to live deliberately" and "to front only the essential facts of life," and he occasionally journeys to nearby Concord, Massachusetts. For 10 points, name this Henry David Thoreau book describing living at a cabin for two years.

ANSWER: Walden; or, *Life in the Woods*

052-13-90-13136

What type of tissue in vascular plants transports water and is found in wood?

ANSWER: xylem

This is a calculation question. Find all solutions to the equation $x^2 - 7 = 2$

ANSWER: x equals 3 and negative 3 [or x equals 3 and minus 3; or x equals plus and minus 3; do not prompt on partial answer]