

IMSANITY

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Head Editor

Noah Prince

Managing Editor

Mike Wong

Contributing Editor

Nolan Maloney

Written By

Noah Prince
Nolan Maloney
Webster Guan
Mike Wong
Saicesh Rao
Rose Sloan
Eric Ordoñez
Aalap Mehta

Tossups

- (1) In one work by this author, a shoe-maker is able to hurt anybody in exchange for one of his hairs after he exchanges rings with a wolf, giving him the ability to command wolves. In addition to *The Wolf Leader*, this author also wrote about Rosa rescuing Cornelius van Baelre, who is jailed after he almost grows the title entity in *The Black Tulip*. This author wrote * *Le Chevalier de Maison-Rouge* as part of his Marie Antoinette romances. He also wrote about a man who is falsely accused of political treason by jealous men, but escapes from jail after the death of Abbé Faria to exact revenge on Villefort and Danglars. FTP, name this author who wrote about Edmond Dantès in *The Count of Monte Cristo*.

ANSWER: Alexandre Dumas, père

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- (2) Stereoisomers and enantiomers may be separated using the “chiral” form of this process, while polar molecules, such as proteins or water, can be separated by charge in the “ion exchange” type. Molecules of greater affinities bind better to the matrix than those with lesser affinities in this process’s * “displacement” type. Heavy pressure is applied to liquid to force it to flow through a densely packed column for better separation of small particles in the “high performance liquid” form, while pigments move via capillary action in its “paper” type. FTP, name this technique with mobile and stationary phases, meaning “color writing” in Greek.

ANSWER: chromatography

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- (3) **This man was nearly defeated by a rebellion on Easter Day led by Juan de Cartagena and Gaspar de Quesada. After this man's death, his slave Enrique betrayed Duarte Barbosa and Juan Serrano for refusing to set him free; those two co-commanders were later killed by Rajah Humabon. Lapu Lapu would not return this man's body after the battle of * Mactan, where he was killed trying to spread Christianity to the Philippines. Juan Sebastian Elcano finished this man's voyage with the Victoria and a crew of twenty-one. FTP, name this Portuguese explorer who led five ships and two-hundred and sixty men on a Spanish expedition that was the first to circumnavigate the earth.**

ANSWER: Ferdinand Magellan or Fernão de Magalhães or Fernando de Magallanes

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- (4) **In one section, the speaker claims that she is not Russian, and that she is a real German. The last lines of an earlier poem by the author forms a section in which Phlebas the Phoenician dies. The lines “weia ala leia/wallala leialala” are repeated in a section about a blind oracle * Tiresias. Its first section references a famous clairvoyante named Madame Sosostriis, and Marie is called the hyacinth girl. A bartender bids Bill, Lou, and May good night after repeatedly shouting “HURRY UP PLEASE IT’S TIME.” FTP, which poem, ending with “Shantih shantih shantih” and opening “April is the cruelest month,” was written by T.S. Eliot?**

ANSWER: The Waste Land

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- (5) **She killed the seven daughters of Niobe while her brother killed Niobe's seven sons, and Agamemnon sacrificed his daughter Iphigenia to appease her. Her father took her form in order to take advantage of Callisto, and Callimachus tells of her granting her father six wishes while sitting on his lap, including to always remain a * virgin. She became hostile towards Eurystheus for demanding the capture of the Ceryneian Hind, a large deer, as deer were sacred to her. The daughter of Leto and Zeus, FTP, name this twin sister of Apollo, the Greek goddess of the hunt.**

ANSWER: Artemis

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- (6) **The writing of this work began while the composer was employed by Jeannette Thurber as director of the National Conservatory. The theme from the Largo movement was adapted for the spiritual “Goin’ Home”. It was written concurrently with his String Quartet No. 12 in F and shares many of the same influences, such as *** Native American music and Negro spirituals. This is reflected in several peculiarities in the melodies such as the use of pentatonic scales, which are also prominently used in the composer’s native Czech music. FTP, identify this final Dvořák symphony inspired by his stay in America.

ANSWER: Symphony No. 9 in E minor, From the New World, Op. 95, B. 178 (accept either underlined parts and equivalents)

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- (7) **Leonhard Euler left his native Switzerland for this country to join its academy of sciences. One mathematician from this country first proved Bertrand’s Postulate that there is always a prime number between any positive integer n and $2n$, and another, along with Janos Bolyai, developed non-Euclidean geometry. In 2006, the Fields Medal was rejected by the mathematician from this country who proved the Poincare Conjecture.*** Chebyshev, Lobachevsky, and Perelman hailed from, FTP, this country in which Euler was a member of the St. Petersburg Academy.

ANSWER: Russia

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- (8) **These can be used to target and capture protein complexes in co-immunoprecipitation, and when they are conjugated to GFPs, they are useful in Western Blotting. They undergo point mutations during somatic hypermutation, and their Fab, Fc, and Fv regions are composed of *** heavy and light chains. Through the induced fit mechanism, epitopes will bind to these molecules’ paratopes, which are located on their variable regions. One mammalian variety of these triggers histamine when bound to allergens, that isotype is IgE. FTP, name these proteins which bind specific antigens and are produced by B cells, also known as immunoglobulins.

ANSWER: antibodies (accept immunoglobulins until mentioned)

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- (9) **Fans threw silver coins onto the field after this was first achieved by Bobby Lowe of the Boston Beaneaters in 1894. Since then, three Phillies players have replicated this feat. Bob Horner and Ed Delahanty both did this, but their teams still went on to lose the game. This has only occurred multiple times in the same year once, in 2002, when, while accomplishing this feat, * Shawn Green went six-for-six and set a record for total bases in a game with nineteen in addition to Mike Cameron only netting the minimum of four RBI's. It most recently occurred when Carlos Delgado accomplished, FTP, this single-game action that requires a lot of power hitting and at least four at-bats.**

ANSWER: hitting four home runs in one game (accept clear-knowledge equivalents)

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- (10) **Its Line 5 Metro ends at Xinzhuang, the capital of its Minghang district. The Xujiahui urban area contains its namesake Jiao Tong University and the St. Ignatius Cathedral. Its inhabitants speak a namesake dialect of Wu Chinese. Its Puxi district includes the famous shopping centers of Huaihai Road and Nanjing Road. The * Oriental Pearl Tower, which lies next to the Huangpu River, and an international airport are both located in Pudong. A historic neighborhood, the Bund, is found in this city which contains the world's first commercial Maglev line. FTP, name this site of the 2010 World Expo, the most populous city in China.**

ANSWER: Shanghai (kowitz and accept "Minghang district" before read)

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- (11) **Only 47 numbers are known to have this property, the largest of which has nearly 26 million digits. Euler proved that the Mersenne primes are in one-to-one correspondence with the even types of these. No * odd numbers are known to have this property, although if any do exist, they have at least nine distinct prime factors. Numbers with this property include 496 and 8128, although more common examples are 6 and 28. FTP, name this property of numbers whose proper divisors sum to themselves.**

ANSWER: perfect (accept word forms)

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- (12) **One of this man's poems opens by referencing Kant's statement that beauty pleases us. In another of his poems, he sees "the cold stars lighting" in someone's cheeks. In addition to "Beauty" and "I Saw His Round Mouth's Crimson", one of his poems opens by describing people "bent double, like old beggars under sacks". This poem later describes "an ecstasy of fumbling" as people put on * gas masks. FTP, name this poet of "An Anthem for Doomed Youth" and "Dulce et Decorum Est", a World War I soldier.**

ANSWER: Wilfred Owen

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- (13) **The dim lighting of this painting accents the image of horror created by the pile of dead bodies in its lower portion. In the upper right side, a black man is propped up by a human pyramid and a barrel and waves a red piece of cloth * high in the air, while another man below him waves a white piece of cloth, in an effort to attract the attention of another ship. FTP, name this painting depicting a group of survivors from a shipwreck off the coast of Africa on a small vessel, created by Theodore Gericault.**

ANSWER: The Raft of the Medusa

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- (14) **His namesake interaction describes the weak force with four particles interacting at one vertex, explaining beta decay. The contradiction between the hypothesis that earth-like planets are common and the observation that there is no evidence of them is his namesake paradox. A doubly-eponymous set of statistics modeling the * energies of individual particles in a system following the Pauli Exclusion Principle is named for this man and Dirac. A class of spin-1/2 particles are named for this man, who created the first sustained nuclear reaction at the University of Chicago. FTP, name this Italian physicist, the namesake of a particle accelerator located in Batavia, Illinois.**

ANSWER: Enrico Fermi

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- (15) **The first person to hold this position opposed the constitution before the Bill of Rights was added, and later served as the fourth vice-president of the United States. Another man held this position before rising to the presidency after the assassination of William McKinley. In addition to** * George Clinton and Teddy Roosevelt, Grover Cleveland and Franklin Roosevelt were elected to this executive office. David Paterson ascended to this office in 2008 after the resignation of Eliot Spitzer. FTP, Andrew Cuomo was recently inaugurated into this office as the commander-in-chief of the armed forces in the second-most populous US state.

ANSWER: Governor of New York

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- (16) **In the back of the scene depicted by this painting, a man wearing a top hat is conversing with a young man wearing a brown coat and hat. On the right foreground of this painting, a man is wearing a white sleeveless shirt. Seated in the lower right of this painting is Aline Charigot, who is holding a dog, and who will later become the artist's wife.** * In the foreground, grapes, wine, and glasses are placed on the table. FTP, name this impressionist painting showing a group of the artist's friends at the Maison Fournaise, painted by Pierre Auguste Renoir.

ANSWER: Luncheon of the Boating Party or Dejeuner des Canotiers

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- (17) **This man showed that when fed at irregular intervals, certain birds demonstrated signs of superstition. He developed a cumulative recorder as well as a case used to measure the effectiveness of different schedules of** * reinforcement. That case, which blocked out external stimuli and featured methods of both reward and punishment, was used in his experimental analysis of behavior, as described in his book *The Behavior of Organisms*, and is known as his eponymous box. Famous for his studies on operant conditioning, FTP, name this American psychologist, a radical behaviorist.

ANSWER: Burrhus Frederick Skinner

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- (18) He included a section titled “Feudalism, Standesaat, and Patrimonialism” in his treatise *Economy and Society*. He examined why capitalism did not develop in China in his *The Religion of China: Confucianism and Taoism*. This thinker defined a state as claiming a monopoly on violence in his * *Politics as a Vocation*, and attacked the Junker aristocracy in his 1895 Freiburg Address. In his most famous work, this thinker related the ideals and values of Calvinism to economic success and the development of capitalism. FTP, name this German author of *The Protestant Ethic and the Spirit of Capitalism*.

ANSWER: Max Weber

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- (19) The OVV kind of these objects generally have strong, broad emission lines; one example is 3C 279. The oldest ones of these entities display suppression in their spectra at wavelengths shorter than the Lyman-Alpha line, called the Gunn-Peterson Trough. They have extremely high * redshifts, and most are found at distances of greater than three billion light years away. FTP, name these objects with accretion disks that are powered by supermassive black holes at their centers and are the most distant, brightest observable objects.

ANSWER: quasars or quasi-stellar radio sources

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- (20) This is the only one of Peano’s axioms for the natural numbers that is second-order. A transfinite version of this can be used on large infinite sets. This exists in strong and weak forms, both of which are logically equivalent to the well-ordering principle of the natural numbers. In proofs, it is used by establishing a * base case and then demonstrating a namesake step invoking a namesake hypothesis. Often stated as “if S of zero is true and S or n implies S of $n + 1$, then S of n holds for all natural numbers n ”, FTP, name this principle and proof technique which progresses from specific to general, a complement to deduction.

ANSWER: mathematical induction

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- (21) **One character in this work says that being put outdoors was the “real terror of life.” The protagonist drinks three quarts of milk in order to use a Shirley Temple cup, and is later scolded by Geraldine after accidentally killing Junior’s cat. Mr. Henry is caught with the whores named China and the * Maginot Line, and Maureen Peal is called “Meringue Pie” after buying the protagonist ice cream. Claudia and Frieda MacTeer plant some seeds unsuccessfully after Cholly rapes his own eleven-year old daughter. FTP, Soaphead Church grants Pecola Breedlove the titular colorful body part in which novel by Toni Morrison?**

ANSWER: The Bluest Eye

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Bonuses

(1) It was the first film of its kind to ever to win an Academy Award. FTPE:

[10] Name this 2001 Japanese film, which follows Chihiro's employment in a bathhouse in the spirit world after her parents are turned into swine.

ANSWER: Spirited Away

[10] *Spirited Away* is an example of this type of Japanese animation.

ANSWER: anime

[10] *Spirited Away* was directed by this man, who is also famous for writing and directing such works as *Princess Mononoke* and *Kiki's Delivery Service*.

ANSWER: Hayao Miyazaki

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(2) Answer these questions about a Cold War episode FTPE:

[10] On May 1, 1960, one of this model of American spy plane was shot down over the Soviet Union in a namesake incident.

ANSWER: Lockheed U2 (also accept "Dragon Lady")

[10] This pilot of the downed U2 plane survived, and was sentenced to 10 years of imprisonment for espionage, although he was released in a prisoner exchange after 21 months.

ANSWER: Francis Gary Powers

[10] This Soviet leader during the U2 incident withdrew from the Paris summit after Dwight Eisenhower refused to apologize for the incident. He had earlier denounced Stalin's purges in the "Secret Speech."

ANSWER: Nikita Sergeyevich Khrushchev

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(3) This man created *Symphony in White: No.1*, or *The White Girl*. FTPE:

[10] Name this American painter who created other works such as *Nocturne in Black and Gold*, or *The Falling Rocket*.

ANSWER: James Abbott McNeill Whistler

[10] This portrait created by Whistler shows a relative of his dressed in black with her hands folded in her lap. It was previously housed at the Louvre, but has been moved to the Musee d'Orsay.

ANSWER: Arrangement in Grey and Black: The Artist's Mother or Whistler's Mother

[10] Whistler's *Arrangement in Grey and Black No. 2* is a portrait of this Scottish philosopher and historian. He is depicted from the side in a similar position to that of Whistler's Mother.

ANSWER: Thomas Carlyle

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(4) Answer the following about an American novel FTPE.

[10] Focusing on the trial of Tom Robinson, a black man accused of rape, this is Harper Lee's only novel.

ANSWER: To Kill a Mockingbird

[10] This man is Tom Robinson's lawyer in *To Kill a Mockingbird*. He is the father of the protagonist.

ANSWER: Atticus Finch

[10] This character is the neighbor of the Finches. She enjoys gardening and befriends the protagonist.

ANSWER: Miss Maudie Atkinson (accept either underlined part)

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(5) This effect is named after the Austrian physicist who proposed it. FTPE:

[10] Name this effect, which describes the change in the frequency of a wave noticed by an observer moving relative to the source of the wave. It is often noticed when a vehicle with a siren passes by.

ANSWER: Doppler effect

[10] As a result of the Doppler effect, this phenomenon occurs when light comes from an object that is moving away from the point of observation experiences. The cosmological variety of it indicates that the universe is expanding.

ANSWER: redshift

[10] The Pound-Rebka experiment tested for evidence of this form of redshift. The Sachs-Wolfe effect describes how photons from the cosmic microwave background radiation experience it.

ANSWER: gravitational redshift

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(6) He spent seven years in the woods masquerading as a wild animal before his mind was restored. FTPE:

[10] Name this king who allegedly constructed the Hanging Gardens of Babylon.

ANSWER: Nebuchadnezzar II

[10] Nebuchadnezzar dreamt of an idol made of gold, silver, bronze, iron, and clay; the dream was interpreted for him by this prophet, who said that the dream represented the ultimate demise of worldly kingdoms.

ANSWER: Daniel

[10] In the Book of Daniel, Nebuchadnezzar has Shadrach, Meshach, and Abednego thrown into this place for refusing to worship his idol, although an angel of God protected them.

ANSWER: fiery furnace (accept equivalents)

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(7) Answer the following about reflective properties of conic sections FTPE:

[10] A beam of light directed from one focus of this conic section towards the other branch will reflect in the direction opposite the other focus.

ANSWER: hyperbola

[10] This type of conic section is used in the design of whispering galleries, as a sound wave emanating from one focus will always reflect off the wall toward the other focus.

ANSWER: ellipse

[10] A beam of light from the focus will reflect off of a parabola along a perpendicular to this line, the distance from which from any point on the parabola equals that point's distance to the focus.

ANSWER: directrix

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(8) The ices of these entities form the greatest freshwater reservoirs on earth. FTPE:

[10] Name these massive objects that move downhill due to gravity, moving through processes such as basal sliding and internal deformation.

ANSWER: glaciers

[10] These structures are mounds of till deposited by glaciers due to deposition of material after a glacier has retreated. They come in the terminal, end, and lateral varieties.

ANSWER: moraines

[10] This term describes coarse gravel deposited from meltwater stream channels. They form long winding ridges that can range from a few hundred feet to tens of miles in length.

ANSWER: esker

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(9) He wrote the essay "On the Vegetable System of Diet," but is more known for his lyric poetry. Name these Percy Shelley works FTPE:

[10] It ends by asking "If Winter comes, can Spring be far behind?" and the "wild" titular entity, which is the "breath of Autumn's being," is also both a "destroyer and preserver".

ANSWER: Ode to the West Wind

[10] This poem begins "Hail to thee, blithe spirit!" The titular figure of this work is "like a cloud of fire" in the sky, and in the "golden lightning of the sunken sun" like "an unbodied joy".

ANSWER: To a Skylark

[10] In this sonnet, the people of the titular country are "starved and stabbed in the untilled field", religion is "Christless, Godless - a book sealed", and the king is "old, mad, blind, despised, and dying".

ANSWER: England in 1819

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(10) Elections take place in municipalities everywhere but they take on different forms. FTPE:

[10] This type of election which is usually used for referendums where the decision of the voting public is made based on which of two options gets more votes.

ANSWER: majority rules or simple majority

[10] Though a simple majority decides a clear winner in a two person race, this type of election occurs when a candidate fails to gain a majority and another round of voting must be conducted but with a restricted number of candidates. It is a popular method in Europe and Louisiana.

ANSWER: run-off election

[10] In this system a majority is not needed. Voters may select several candidates, and the candidate receiving the largest number of votes is elected to office. This method takes its name from horse racing.

ANSWER: First Past the Post or Furthest Past the Post or FPP

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(11) Identify the following about a certain branch of mathematics FTPE:

[10] This branch of mathematics, with applications in economics and biology, studies optimal strategies, especially in problems such as Chicken and the Prisoner's Dilemma.

ANSWER: game theory

[10] Poker is an example of this type of game, in which one player's winnings are always in balance with other players' losses.

ANSWER: zero-sum

[10] This mathematician, one of the first to study game theory, won the 1994 Nobel Memorial Prize in Economics for the development of his namesake equilibrium.

ANSWER: John Forbes Nash

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(12) Answer these questions about some Hapsburgs FTPE:

[10] This Hapsburg Emperor ruled Austria for sixty-eight years. In that time, he lost a war to Prussia and failed to stop the unification of Italy. He joined the Triple Alliance and led Austria-Hungary into World War I before his 1916 death.

ANSWER: Emperor Franz Josef I

[10] Born a Bavarian duchess, this wife of Emperor Franz Josef learned Hungarian and helped to forge the Austro-Hungarian Compromise of 1867. She was assassinated in Geneva in 1898 by the Italian anarchist Luigi Lucheni.

ANSWER: Empress Sisi or Empress Elisabeth of Bavaria

[10] In 1864, this Hapsburg gave up his Austrian titles of nobility so that Napoleon III could install him as Emperor of Mexico. That country was in constant turmoil until his downfall and execution in 1867 by Benito Juárez.

ANSWER: Emperor Maximilian I of Mexico

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(13) Name these scientists who discovered certain particles FTPE:

[10] This English scientist discovered the neutron.

ANSWER: James Chadwick

[10] This English scientist created an experiment using a cathode ray tube in which he discovered the existence of the electron.

ANSWER: Sir Joseph John Thomson

[10] During World War II, he researched rocketry at Caltech. He is famous for his discoveries of the muon and the positron.

ANSWER: Carl David Anderson

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(14) The second part of this symphony follows the final events in Goethe's *Faust*. FTPE:

[10] Name this symphony nicknamed for the large number of performers who performed it.

ANSWER: Symphony of a Thousand (or Mahler's Symphony no. 8, accept equivalents, but do not read alternate answers)

[10] This composer of *Symphony of a Thousand* based his *Symphony No.1 in D major* off of Jean Paul's novel *Titan*.

ANSWER: Gustav Mahler

[10] This Mahler work has its sections based on poems from *The Chinese Flute*. Its first movement, "The Drinking Song of Earth's Misery" is based on "Bei Ge Xing", a poem by Li Po.

ANSWER: Song of the Earth or Das Lied von der Erde

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(15) Answer the following about probability distributions other than the normal distribution FTPE:

[10] This finite probability distribution measures the number of successes of a repeated Bernoulli trial. As the number of experiments goes to infinity, this distribution converges to a normal distribution.

ANSWER: Poisson binomial distribution (DO NOT prompt on or accept “Poisson distribution”)

[10] If X is a random variable obeying a normal distribution, then e^X obeys this distribution.

ANSWER: lognormal or Galton’s distribution

[10] The integral from negative infinity to x of a probability distribution function yields this type of function.

ANSWER: cumulative distribution function or cumulative density function or cdf

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(16) It stated that majorities do not incur wisdom and justice simply by being majorities. FTPE:

[10] Name this 1849 essay, which argued that citizens have a responsibility to resist unjust government, famous for the statement “that government is best which governs least.”

ANSWER: Civil Disobedience

[10] *Civil Disobedience* was written by this transcendentalist philosopher who is better known for his book *Walden*.

ANSWER: Henry David Thoreau

[10] Ralph Waldo Emerson wrote this transcendentalist essay, which argued that society should not preclude a solitary lifestyle on the basis that “a foolish consistency is the hobgoblin of little minds”.

ANSWER: Self-Reliance

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(17) Identify the following about a certain kind of financial derivative FTPE:

[10] This financial derivative is an agreement between two parties guaranteeing the first the right to buy from or sell to the second party some underlying asset at a predetermined time and price.

ANSWER: option

[10] An option in which the first party may choose to buy the underlying asset is this type. It is contrasted with a “put option”.

ANSWER: call option

[10] This type of option can only be exercised on its expiration date.

ANSWER: European

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(18) It declares that “so much depends upon” this titular device “glazed with rain water beside the white chickens”. FTPE:

[10] Name this sixteen-word poem about a colorful piece of equipment.

ANSWER: The Red Wheelbarrow

[10] This poet included “The Red Wheelbarrow” in his collection *Spring and All* under the original title of “XXII”.

ANSWER: William Carlos Williams

[10] Williams won a Pulitzer Prize in 1963 for his poetry collection entitled *Pictures From [this Flemish painter] and Other Poems*.

ANSWER: Brueghel

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(19) In the lower right hand corner of this painting, the titular figures still have their hands shackled, even though they have been thrown overboard into the ocean. FTPE:

[10] Name this painting of the title boat sailing as a storm approaches.

ANSWER: The Slave Ship or

Slavers Throwing Overboard the Dead and Dying-Typhoon Coming On

[10] This artist of *The Slave Ship* created other works such as *Ulysses Deriding Polyphemus* and *The Fighting Temeraire*.

ANSWER: Joseph Mallord William Turner

[10] This Turner painting depicts a reddish iron bridge over the Thames, and is subtitled *The Great Western Railway*.

ANSWER: Rain, Steam, and Speed: the Great Western Railway

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(20) Answer these questions about evolution FTPE:

[10] This law states that in a large population, with no non-random mating, selection, mutations, or gene flow, allele frequencies remain constant.

ANSWER: Hardy-Weinberg Law or Equilibrium or Principle (accept equivalents)

[10] This phenomenon significantly affects small populations, which is why a large population is needed for Hardy-Weinberg equilibrium. It refers to the change in allele frequencies due to random chance.

ANSWER: Genetic Drift

[10] This principle refers to the ability for a single species to diversify into multiple forms, each of which will become adapted to its specific environment.

ANSWER: adaptive radiation

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(21) The title character criticizes one of his friend's pictures of Goethe, and Pablo, the saxophonist, brings him to a "Magic Theatre." FTPE:

[10] Hermine introduces Maria to Harry Haller, known by the titular nickname, in this novel.

ANSWER: Steppenwolf

[10] This author of *Steppenwolf* also wrote the bildungsroman *Peter Camenzind* in addition to writing about Joseph Knecht in *The Glass Bead Game*.

ANSWER: Hermann Hesse

[10] Hesse also wrote this novel in which the titular character, joined by his friend Govinda, seeks out spiritual truth, ultimately concluding that "It was the self, the purpose and essence of which I sought to learn...And there is no thing in this world I know less about than about me".

ANSWER: Siddhartha

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