

IMSANITY

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Tossups

- (1) **Douglas Mackiernan was killed delivering espionage information about the start of this event. United Nations Resolution 83 was based on that information, which only passed because the Soviet Union had been boycotting the UN Security Council. The aggressors originally gained the upper hand, but events such as the * Inchon landing made this a “seesaw war”. The United States forces were led by Douglas MacArthur until he was removed by President Truman for public insubordination. The US supported the Southern regime of Syngman Rhee and the Chinese supported the Northern regime of Kim-Il Sung in, FTP, this conflict between the two halves of a namesake Southeast Asian peninsula.**

ANSWER: Korean War

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- (2) **The protagonist of this work is thrilled by the “silken sad uncertain rustling” of the purple curtains, and later implores for a nonexistent “Sir” or “Madam’s” forgiveness because he was “napping.” He calls the title figure “stately” and “of the saintly days of * yore,” and inquires about whether there is “balm in Gilead.” He asks what the title figure’s “lordly” name is on the “Night’s Plutonian shore.” The speaker constantly laments for his lost love, Lenore, while the title figure perches on the “pallid bust of Pallas.” FTP, name this poem about a creature that constantly croaks “Nevermore”, written by Edgar Allen Poe.**

ANSWER: The Raven

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- (3) **It was first postulated by John Michell in a letter to Henry Cavendish, and a famous theorem states that one of these only has only three observable properties upon reaching stability. Rotating ones are surrounded by ergospheres, and Subramanyan * Chandrashekar provided a base mass for a non-rotating one of these. Gamma ray bursts sometime signal the formation of these, and quasars surround supermassive ones in a galaxy’s center. Matter undergoes “spaghettification” when it passes the event horizon. FTP, these dense singularities from which not even light can escape.**

ANSWER: Black Hole

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- (4) In his “Reinterpretation” of this philosopher, Walter Kaufman argued that this man had not developed the idea for which he is most famous; instead, Kaufman argued, this philosopher simply liked grouping things in triads. This man’s first work was split into six divisions and argues that, by continually using knowledge to analyze knowing, consciousness can eventually lead to absolute knowledge. That work is also credited as introducing *Aufhebung*, in which * thesis and antithesis give rise to synthesis, better known as this man’s namesake dialectic. Also known for his discussion of the master-slave dialectic, FTP, name this German philosopher and author of *Phenomenology of Spirit*.

ANSWER: Georg Wilhelm Friedrich Hegel

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- (5) This artistic movement includes works such as *Joseph in Egypt* and *Entombment*. Artists involved in this movement include Allesandro Allori, who exemplified this artistic movement in his *Susanna and Elders*. Along with works by Jacopo da Pontormo and Agnolo Bronzino, famous works in this movement include * *Self-Portrait in a Convex Mirror* as well as works by El Greco. FTP, name this artistic movement characterized by unrealistic spatial proportions, well epitomized by Parmigianino’s *Madonna of the Long Neck*.

ANSWER: mannerism

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- (6) The set of numbers which can be expressed as a sum of two of these is closed under multiplication according to a formula of Brahmagupta and Fibonacci. These integers have an odd number of factors, and every natural number is the sum of four of them by Lagrange’s Theorem. The sum of any two consecutive * triangular numbers is one, as is the sum of any initial segment of the positive odd integers. When divided by four, they must leave a remainder of 0 or 1, and they cannot end with the digits 2, 3, 7, or 8. FTP, name this group of integers, obtained by multiplying an integer by itself.

ANSWER: perfect squares

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- (7) **This character begins to read “The Three Black Pennies,” but stops because it criticized the “good common ways”. He works with William Eathorne and Pastor John Drew to help spread the popularity of the Chatham Road Presbyterian Sunday school. His circle of friends are the Roughnecks, who always lunch at the * Athletic Club of Zenith. They make fun of him when he starts to support the liberal Seneca Doane. After becoming Vice President of the Booster Club, he goes to prison to visit a friend who has just shot his wife, Paul Riesling. FTP, name this realtor, whose wife is Myra, the title character of a work by Sinclair Lewis.**

ANSWER: George Follansbee Babbitt

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- (8) **A song by this name from Ke\$ha’s Animal album repeats “you’re just an old man hitting on me, what? You need a CAT scan”. This also names the titular characters on qwantz.com as well as a TV series whose storylines included Sexual Harris inventing innuendo and the Grapolites escaping extinction. In that show, the anthropomorphic Sinclair family struggles to adapt to * civilization. Syd Hoff’s book about Danny and this title figure won the New York Times Outstanding Children’s Book of the Year in 1958. The subject of the animated Land Before Time movies, FTP, name these large prehistoric reptiles.**

ANSWER: dinosaurs

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- (9) **A response to this man’s autobiography entitled *Because He Could* was written by Dick Morris. As the youngest governor in the nation at 32, he improved his home state’s historically-weak education program and highway system. He released his bar license for five years as per a settlement in a case involving shady business dealings during his governorship with Jim McDougal that came to be known as the * Whitewater affair. He was paid an advance of \$15 million for his personal and political autobiography, My Life. That same year, his Presidential Library opened in Little Rock, Arkansas. FTP, name this United States president whose two terms were bookended by Bush administrations.**

ANSWER: William Jefferson “Bill” Clinton

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- (10) **A special case of this was developed by Howard Percy Robertson, and Ernest Schrödinger added a term for the anticommutator. Hermitian operators are used to derive this rule since it concerns a scenario on Hilbert spaces of arbitrary dimensions, and it can be stated as an application of the Cauchy-Schwarz inequality to the inner product of two vectors.** * Einstein argued against it in a series of thought experiments, including his box and slit experiments. Arising due to the nature of a system in quantum mechanics, it states that it is impossible to precisely know both the position and momentum of a particle. FTP, name this principle named after a German physicist.

ANSWER: Heisenberg uncertainty principle

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- (11) **This author of “The Soft Voice of the Serpent” wrote about Hillela, formerly known as Kim Capran, joining the ANC in *A Sport of Nature*. In another novel, an illegal immigrant named Abdu falls in love with Julie before going to the United States. In addition to writing *The Pickup* and** * *Burgher’s Daughter*, this author also wrote about the discovery of a dead body by Jacobus, who later informs Mehring. Her most famous work ends with Maureen chasing a helicopter after Daniel steals Bamford Smale’s gun. FTP, name this South African author of *The Conservationist* and *July’s People*.

ANSWER: Nadine Gordimer

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- (12) **Donald Knuth said that he “consider[ed] assignment statements and” these “variables to be among computer science’s most valuable treasures”. Due to a name-sake arithmetic, adding 1 to this kind of variable usually results in a larger increase. Instead of objects, Java passes a corresponding one of these. In C, these are** * dereferenced with an asterisk and an ampersand is used to assign them values. These variables are dangerous if they are dangling or null; the latter case results in an exception. FTP, name this type of variable which stores memory locations.

ANSWER: pointer

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- (13) **Its name can be traced back to an Arabic phrase meaning “frankincense of Java”, and Michael Faraday isolated it from illuminating gas in 1825. The American Petroleum Institute considers the only safe level for this chemical to be zero, and its substituents can be classified as *** ortho, meta, or para directing. A known carcinogen, this molecule can undergo Birch reduction and sulfonation, but is better known for alkylation and acylation reactions devised by Charles Friedel and James Crafts. Delocalized pi-bonds and alternating double bonds create resonance in, FTP, this carbocyclic aromatic molecule with formula C_6H_6 whose structure was first theorized by August Kekulé.

ANSWER: benzene

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- (14) **Despite its name, the composer structured it very loosely as a joke. This piece’s episodic nature was inspired by the style of von Suppé. In addition to referencing the *Rákóczi March*, it consists of various student drinking songs such as “We Have Built a Stately House”, “Father of our Land”, and, most famously, “Gaudemus igitur”. *** Its composer paired it with a stylistically contrasting *Tragic* overture when he presented it as a musical “thank you” to the University of Breslau for conferring an honorary degree. FTP, name this concert overture by Johannes Brahms.

ANSWER: Academic Festival Overture or Akademische Festouvertüre

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- (15) **A theorem of Fortuin, Kasteleyn, and Ginibre states that increasing events are positively correlated and is known as the FKG one of these. Jensen’s states that convex functions lie below their secant lines, and Markov’s shows that a random variable cannot be large with high probability. A more notable one implies states that *** x plus y is at least 2 times the square root of $x y$ and is known as the arithmetic mean-geometric mean one, and another states that the length of one side of a triangle is at least the difference and at most the sum of the other two side lengths. Relationships comparing two quantities are, FTP, these, exemplified by e to the x is greater than or equal to one plus x .

ANSWER: inequalities (accept word forms)

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- (16) **This work ends with a writer for the newspaper “Fanal de Rouen” receiving a cross of the Legion of Honor. One character always dines at six o’clock at the Lion d’Or; that character is Binet. After having surgery on his leg, a clubfooted character named * Hippolyte [Hee-po-LEET] develops gangrene. The title character fakes piano lessons in order to see her love interest Léon Dupuis. Her large sums of debt owed to Monsieur Lheureux prompt her to commit suicide by ingesting arsenic from the chemist, Homais. FTP, name this novel about Dr. Charles and his adulterous wife Emma, written by Gustave Flaubert.**

ANSWER: Madame Bovary

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- (17) **This deity is thanked for his assistance in the Behistun Inscription near the city of Kermanshah. He was worshipped alone until the reign of Artaxerxes the Second, when he was venerated alongside Apam Napat and Mithra. His six underlings were collectively known as the * Amesha Spentas, and they opposed the demonic Daevas. This son of Zurvan is described in the Avesta and sent Vohu Manah to fetch a certain Persian prophet. Predestined to win at Frashokereti against Angra Mainyu, FTP, name this supreme god of Zoroastrianism.**

ANSWER: Ahura Mazda

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- (18) **This man was the oldest son of a leader who, in the Mercenary War, defeated an army that mutinied against him. One of this man’s brothers was killed at the Battle of the Metaurus, while his other brother * Mago led an ambush at the Battle of Trebia, leading this man to victory. Fabius Maximus successfully employed a namesake delaying strategy against this general who won the battles of Lake Trasimene and Cannae. This leader swore an oath to his father Hamilcar that he “would never be friends with a Roman.” FTP, name this member of the Barcid family who was defeated by Scipio Africanus at the battle of Zama, leading to the defeat of Carthage in the Second Punic War.**

ANSWER: Hannibal Barca

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- (19) **The F-box protein TIR1 serves as a receptor for these types of compounds, which, when activated, leads to ubiquitination of repressors by the SCF complex, allowing specific genes to be expressed. These compounds work in conjunction with cytokinins to determine whether roots or shoot buds are formed. They also are responsible for maintaining apical dominance, and also govern * geotropism and phototropism, the growth of plants towards the earth and light, respectively. The most common one of these plant hormones found in plants is indoleacetic acid. FTP, name this class of plant hormones, like giberellins, whose presence encourages stem elongation.**

ANSWER: auxins

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- (20) **Two of his self-portraits include one “as a Young Man” and another one several years later “as a Mature Man”. Pope Clement IX commissioned one of his works, a sculpture which shows the title figure holding the titular pointy headware, in *Angel with the Crown of Thorns*. Another one of his works is of three titular figures fleeing from the city of Troy, *Aeneas, Anchises, and Ascanius*. He depicted a nymph undergoing metamorphosis in his * *Apollo and Daphne*, but his most famous work depicts an angel about to pierce a saint with an arrow. FTP, name this sculptor of *The Ecstasy of St. Theresa*.**

ANSWER: Gianlorenzo Bernini

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- (21) **In 1878, the king of this state had a replica of the Palace of Versailles built called Herrenchiemsee. This state is home to a city which hosts an annual Wagner Festival and another which hosted military tribunals in the aftermath of World War II. In addition to * Bayreuth and Nuremberg, this state is home to Regensburg, located at the confluence of the Regen and Danube rivers in the valleys of this state’s namesake branch of the Alps. In the largest city in this state, one can find the English Gardens on the banks of the Isar river. The largest German state by area is, FTP, this southern Free State with capital at Munich.**

ANSWER: Bavaria or Bayern

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Bonuses

(1) Answer the following about arrays used in algebra FTPE:

[10] Linear algebra studies these 2-dimensional rectangular arrays of numbers which are often used to represent coefficients in a system of equations.

ANSWER: matrix or matrices

[10] This number associated with a square matrix can be computed either by cofactor expansion or Gauss-Jordan elimination. A matrix has an inverse if and only if this number is nonzero.

ANSWER: determinant

[10] This rule gives a formula for a solution of a system of equations where each variable is the quotient of determinants of matrices. In each case, the matrices in the numerator and denominator are the same except for one column.

ANSWER: Cramer's Rule

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(2) This painting depicts a man in white serving a woman in a red dress and two other men wearing hats at a bar at night. FTPE:

[10] Name this painting by Edward Hopper.

ANSWER: Nighthawks

[10] An advertisement for this brand of tobacco products hangs above the bar in Nighthawks. They only cost 5 cents!

ANSWER: Phillies Cigars

[10] This Hopper painting depicts a woman alone at a restaurant. She is wearing a yellow hat and sits at a round table, and a dish filled with fruits sits on the windowsill behind her.

ANSWER: Automat

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(3) Identify these figures from Roman mythology FTPE:

[10] Name his goddess of love and beauty, the equivalent of the Greek Aphrodite.

ANSWER: Venus

[10] One consort of Venus was this god of fire. As a child, he was so ugly that his mother threw him from Mount Olympus. As a blacksmith, he made lightning bolts for Jupiter.

ANSWER: Vulcan

[10] Venus was also romantically involved with Mars, with whom she had this son, the god of fertility.

ANSWER: Eros

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(4) Answer these questions about bacteria FTPE:

[10] This kind of bacteria turns purple when tested with the namesake stain. They are characterized by a thick peptidoglycan wall anchored by polysaccharides to the cell membrane, and include the genus *Staphylococcus*.

ANSWER: Gram Positive

[10] These bacteria are generally identified by the Ziehl-Neelsen stain or Kinyoun method and are characterized by their high mycolic acid content. *Mycobacteria* are an example.

ANSWER: Acid Fast

[10] These structures in bacteria are shaped like screws and provide bacteria mobility by rotating. In eukaryotic cells, they consist of a long, whiplike structure.

ANSWER: flagella (accept “flagellum”)

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(5) Statisticians often need to scale data points according to their mean and variance. Answer the following FTPE:

[10] For data following a normal distribution, this quantity measures how many standard deviations a data point is from the mean. Its familiar name comes from an alternative name for the normal distribution.

ANSWER: z-score or standard score or z-value

[10] To within 1, this is the percentage of data points in a normal distribution whose z -score is between -2 and 2 .

ANSWER: 95.5 (accept any number between 94.5 and 96.5)

[10] This function, when evaluated at a divided by the square root of 2, gives the percentage of data points from a standard normal distribution whose z -score is between $-a$ and a .

ANSWER: Gauss(ian) error function or erf

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(6) Identify the following about an English composer FTPE:

[10] This English composer of the *Pomp and Circumstance* marches also composed a work based on a poem by John Henry Newman, *The Dream of Gerontius*.

ANSWER: Edward Elgar

[10] This Elgar orchestral piece is dedicated to Elgar’s friends featured in it; the first is based on Elgar’s wife.

ANSWER: Enigma Variations or Op. 36

[10] Music in this section of the *Enigma Variations* captures a discussion between Elgar and Augustus Jaeger regarding Beethoven’s works. It is the ninth variation.

ANSWER: Nimrod

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(7) He names an approximation with Max Born which simplifies the process of calculating a wavefunction. FTPE:

[10] Name this “father of the atomic bomb”, the scientific director of the Manhattan Project.

ANSWER: J. Robert Oppenheimer

[10] This nuclear device, dropped by the Bockscar over Nagasaki on August 9, 1945, may have been named after Winston Churchill. It utilized implosion, with its force derived from the fission of Plutonium 239.

ANSWER: Fat Man

[10] He wrote a letter, signed by Albert Einstein, that was sent to President Roosevelt regarding the possibility that Nazi Germany was researching nuclear weapons and advised the United States to begin its own nuclear research. Along with Enrico Fermi, he created and patented the first nuclear reactor.

ANSWER: Leo Szilard (accept names in either order)

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(8) Name these curves in economics FTPE:

[10] The creator of this eponymous curve, which relates the tax rate to tax revenue, originally had trouble getting people to believe his claim, in part because it was first drafted on a napkin.

ANSWER: Laffer curve

[10] This curve is used to depict income distribution. Its endpoints occur at the intersection of the lines of perfect equality and perfect inequality.

ANSWER: Lorenz curve

[10] This curve plots interest rates against a loan's time to maturity. The curve is increasing, as longer-term arrangements lead to higher returns.

ANSWER: yield curve

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(9) Identify the following Jewish texts FTPE:

[10] Known in Greek as the Pentateuch, this is the collective name for the Five Books of Moses, which forms the first third of the Tanakh, or Hebrew Bible.

ANSWER: Torah

[10] Second only to the Tanakh in importance, this recorded oral Judaic tradition is composed of two parts, the Mishnah and Gemara.

ANSWER: Talmud

[10] This mystic text, central to Kabbalah, discusses secret and hidden meanings within the Torah.

ANSWER: Zohar

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(10) Bill ends up being the horse for the title character, and in the end Bill and Sam accept Ebenezer Dorsett's request. FTPE:

[10] Two kidnappers are forced to pay \$250 instead of collecting \$2,000 to get rid of the title character in this short story.

ANSWER: The Ransom of Red Chief

[10] Another short story by the same author sees Jim sell his pocket watch to buy a set of hair combs for Della while Della sells her hair to buy a platinum fob for Jim's pocket watch.

ANSWER: The Gift of the Magi

[10] This author of "The Ransom of Red Chief" and "The Gift of the Magi" also wrote about the hobo Soapy in "The Cop and the Anthem" as well as Jimmy Valentine in "A Retrieved Reformation."

ANSWER: O. Henry or William Sydney Porter

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(11) Answer the following about notably short quarterback Doug Flutie FTPE:

[10] Flutie played his college football at this school, which he led to victory over the University of Miami on a last-second Hail Mary touchdown in 1984 en route to winning this school's only Heisman Trophy. This college also produced quarterbacks Matt Hasselbeck and Matt Ryan.

ANSWER: Boston College

[10] Flutie led the Calgary Stampeders and the Toronto Argonauts to this Championship of the Canadian Football League.

ANSWER: Grey Cup

[10] In the last play of his NFL career, Flutie performed the first drop-kick in over sixty years while backing up Tom Brady on this team.

ANSWER: New England Patriots (accept either underlined part)

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(12) Answer the following about the Great Depression FTPE:

[10] Okies were refugees that had fled this ecological disaster caused by the removal of the natural grass that anchored the soil of the Great Plains.

ANSWER: Dust Bowl

[10] This employee of the Farm Security Administration is famous for her photographs such as *Migrant Mother* showcasing Depression-era poverty.

ANSWER: Dorothea Lange

[10] This 1933 New Deal program taxed food processing companies and paid farmers to let their fields lie fallow. The Supreme Court struck down this program in 1936 in *United States vs Butler*.

ANSWER: Agricultural Adjustment Administration or AAA (also accept "Agricultural Adjustment Act")

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(13) The change in this state function under constant pressure is equal to the energy added by heat. FTPE:

[10] Given as the internal energy plus the product of pressure with volume, name this quantity symbolized H.

ANSWER: enthalpy

[10] This Law states that the enthalpy change for a reaction is equal to the sum of the enthalpy changes for each individual step.

ANSWER: Hess's Law

[10] Hess's Law is one way of expressing this law; another way is that, while energy can change form, it cannot be created or destroyed.

ANSWER: First Law of Thermodynamics

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(14) Answer the following questions about an American author FTPE:

[10] This author of *The Torrents of Spring*, *Across the River and Into the Woods*, and *Islands in the Stream* committed suicide at the age of 61 in Ketchum, Idaho.

ANSWER: Ernest Hemingway

[10] This Hemingway novella is about a Cuban fisherman named Santiago who has not caught a fish for several months. Santiago is a fan of American baseball, especially Joe DiMaggio.

ANSWER: The Old Man and the Sea

[10] This other Hemingway novel, which tells the story of the soldier Fredric Henry and the nurse Catherine Barkley, echoes Hemingway's own experience in World War I.

ANSWER: A Farewell To Arms

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(15) Sunlight from the upper left of this painting shines through the trees onto the central figure. FTPE:

[10] Name this painting depicting a woman in pink performing the title recreational activity, while a man looks up her dress.

ANSWER: The Swing

[10] This rococo artist of *The Swing* also depicted a girl in yellow holding a book in *A Young Girl Reading*.

ANSWER: Jean-Honore Fragonard

[10] This other rococo artist created portraits of Madame de Pompadour as well as the *Toilet of Venus*.

ANSWER: Francois Boucher

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(16) Answer the following about some strange topological surfaces FTPE:

[10] This one-sided surface can be obtained by adding a half-twist to a strip of paper and connecting the opposite ends.

ANSWER: Möbius band or Möbius strip

[10] This one-sided surface differs from the Möbius band in that it has no boundary. Its unusual name comes from a mistranslation of the word for “surface”.

ANSWER: Klein bottle

[10] Both the Möbius band and the Klein bottle lack this topological property, in which the right-hand rule can be used to define a “clockwise” direction.

ANSWER: orientability (accept word forms)

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(17) Identify the following enemies of Napoleon FTPE:

[10] This British noble won the peninsular campaign against the French and is famous for inflicting Napoleon’s final defeat at Waterloo. He later passed Catholic Emancipation as Prime Minister.

ANSWER: Arthur Wellesley or Duke of Wellington

[10] This Czar made a treaty with Napoleon at Tilsit which both sides broke. He founded the Holy Alliance after Napoleon’s downfall.

ANSWER: Czar Alexander I of Russia

[10] After driving Moreau out of Germany, this Austrian prince outmaneuvered Napoleon in Italy. This “Victor of Aspern” reformed the Austrian army for the war of 1809, in which he inflicted heavy losses on Napoleon’s army.

ANSWER: Archduke Charles

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(18) Eliot Fremont-Smith called it “not simply the best book on hippies, it is the book”. FTPE:

[10] Name this 1968 “nonfiction novel” which detailed the travels and LSD-inspired antics of the Merry Pranksters.

ANSWER: The Electric Kool-Aid Acid Test

[10] This author wrote *Radical Chic & Mau-Mauing the Flak Catchers* in addition to *The Electric Kool-Aid Acid Test*.

ANSWER: Tom Wolfe

[10] In *The Electric Kool-Aid Acid Test*, Wolfe discusses the Merry Pranksters’ interactions with this motorcycle gang, the subject of an eponymous book by Hunter S. Thompson.

ANSWER: The Hell’s Angels

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(19) Let's talk about climate. FTPE:

[10] Levels of this greenhouse gas fluctuate greatly between seasons. It currently has an average concentration of about 390 parts per million, an increase of almost forty percent from preindustrial levels.

ANSWER: carbon dioxide or CO₂

[10] This molecule, in its gaseous form, makes the most significant contribution to global warming. It is largely responsible for the positive feedback mechanism of global warming.

ANSWER: water or H₂O (accept and be amused by dihydrogen monoxide)

[10] This theory describes the changes in Earth's climate due to its movement. It includes a 26,000 year cycle of precession, 41,000 year cycle of changes in axial tilt, and a 21,000 year cycle in which earth's elliptical orbit rotates.

ANSWER: Milankovitch cycles or theory (accept equivalents containing "Milankovitch")

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(20) Name these works from psychology FTPE:

[10] This work introduced the Id-Superego-Ego trichotomy. It marked a change in its author's viewpoint that human drive is primarily sexually motivated.

ANSWER: Beyond the Pleasure Principle

[10] This work by the same author describes his theory of wishful fulfillment; in the unconscious state, the titular vision may be subjected to further inquiry.

ANSWER: The Interpretation of Dreams

[10] This psychologist wrote *Beyond the Pleasure Principle* and *The Interpretation of Dreams*.

ANSWER: Sigmund Freud

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(21) The title character, named Gloriana, represents Queen Elizabeth. FTPE:

[10] Artegal, the champion of Justice, and Britomart, the champion of Chastity, fall in love in this English epic.

ANSWER: The Faerie Queene

[10] This author of *The Faerie Queene* also requested that the "Sweet Thames run softly till I end my song" in *Prothalamion*.

ANSWER: Edmund Spenser

[10] This hero of Book 1 of *The Faerie Queene* represented Holiness becomes St. George and ends up marrying Una after slaying a dragon.

ANSWER: Redcrosse Knight

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