

1. A so-called bulk or second variety of this property exists, but is unimportant in the incompressible case. This property can decrease over time in response to applied shear, a phenomenon known as thixotropy. This quantity appears multiplying the axial length and volumetric flow rate in the usual form of Poiseuille's equation. The effects of this property dominate at low Reynolds' numbers as this quantity is the denominator of the Reynolds number. This quantity appears as the constant of proportionality between the shear stress and perpendicular velocity gradient for a Newtonian fluid. This property increases with temperature for gases but decreases for liquids; relatedly, for a superfluid below the lambda point, this property has a value of zero. For 10 points, name this measure of a fluid's internal resistance to flow.

ANSWER: viscosity

003-09-12-19102

2. One figure in this painting wears a hat with red and white triangles and a necklace of beads with a cross. A face can be seen in front of a church at the top of this painting. A line connects the eyes of the two largest figures in this painting, one of whom feeds a flower to the other. Other figures in this work include a woman milking a goat and a man with a scythe next to a woman who, like two of the houses in this painting, is upside-down. The two largest figures in this work are a green man and a goat that loom over much of the canvass, which may depict the town of Vitebsk, Belarus. For 10 points, name this painting by Marc Chagall.

ANSWER: *I and the Village*

024-09-12-19103

3. Miguel Landivar spread rumors that this figure was an escaped convict to support Agostino Mainardi, who accused this person of heresy. This person had a vision of God telling him "I will be propitious to you at Rome" before he experienced an awakening while praying in a cave near Manresa. This mentor of Peter Faber and Diego Lainez expressed his belief that obedience was the pre-eminent virtue in his "Letter on Obedience." Francis Xavier was a follower of this leader, who created a program of prayer and contemplation divided into four weeks in his *Spiritual Exercises*. For 10 points, name this founder of the Jesuits, a Spanish saint from Loyola.

ANSWER: Saint Ignatius of Loyola

004-09-12-19104

4. A cascading Harry Bertoia sculpture falls from the oculus of one building constructed by this architect, which contains an aluminum spire atop a windowless brick cylinder surrounded by a moat. He placed a green "oval" between that structure and a nearby auditorium that he also designed. He designed a thin-shell roof over a "head house" in a structure that used red carpet in tube-shaped departure-arrival corridors. This architect of the MIT Chapel, Kresge Auditorium, and TWA terminal at JFK also designed a structure based on a catenary curve, which overlooks the Mississippi River. For 10 points, name this Finnish architect who designed the Gateway Arch.

ANSWER: Eero Saarinen [prompt on Saarinen; prompt on E. Saarinen; do not accept "Eliel Saarinen"]

020-09-12-19105

5. Strabo describes how an expedition of this people under Brennus supposedly plundered cursed gold from Delphi which was later inherited by Marcus Junius Brutus, after which they settled a namesake region of north central Turkey. An empire named after this people was founded by Postumus and conquered by the Emperor Aurelian in 274 AD. Members of this variant of the La Tene culture killed 46 centurions at Cergovia before being defeated at the Siege of Alesia while under the leadership of Vercingetorix. For 10 points, name this group of people whose defeat was narrated in a series of namesake commentaries written by Julius Caesar

ANSWER: **Gauls**

059-09-12-19106

6. In a monologue, this character declares "deeper than did ever plummet sound / I'll drown my book." This character accepts responsibility for a servant by saying "this thing of darkness / I acknowledge mine" in a speech revealing his true identity. That servant had earlier complained that this character "taught me language, and my profit on't / Is, I know how to curse." Stephano and Trinculo plot against this character, but are foiled by a being this character freed from a cloven pine. This character says "We are such stuff / As dreams are made on, and our little life / Is rounded with a sleep" in a speech that begins "Our revels are now ended." For 10 points, name this character who allows Ferdinand to marry his daughter Miranda, a former Duke of Milan who uses magic to control Ariel and Caliban in Shakespeare's *The Tempest*.

ANSWER: **Prospero**

062-09-12-19107

7. In one myth, this deity's mother fasted for a year so he could be born, but he did not assume his present form until Shani looked at him. This deity slashed the face of the moon after it laughed at him for using a serpent to bandage up his sweet-filled stomach. In similar myths, this figure was consoled by Narada, became the commander of the celestial armies, and outsmarted his brother Skanda in a contest to circumnavigate the world three times. This figure did not allow Shiva to enter his house, and so Shiva decapitated him. For 10 points, name this remover of obstacles in Hinduism, a god whose decapitated head was replaced by that of an elephant.

ANSWER: **Ganesh** [or **Ganapati**; or **Vinayaka**; or **Pillaiyar**; or **Vighnesha**; or **Vighneshvara**]

064-09-12-19108

8. In his final years, this composer completed his Opus 73, a set of seven "moods" for piano that includes the pieces "Homage to Chopin" and "Night Ride." This composer adapted the melody of the halling for many of the twenty-five folksongs and dances that make up his Opus 17. Simon Barere died while performing this composer's only piano concerto, which imitates the beginning of Schumann's piano concerto and is in A minor. This composer included his works "Arietta," "March of the Dwarfs," and "Wedding Day at Troldhaugen, in his collection of sixty-six short *Lyric pieces*. This composer depicted the rising of the sun over the Sahara desert in "Morning Mood," part of his incidental music to *Peer Gynt*. For 10 points, name this composer of "In the Hall of the Mountain King," a Romantic composer from Norway.

ANSWER: Edvard **Grieg**

004-09-12-19109

9. This quantity is equal to the molar mass times the difference in specific heat between a constant pressure and constant volume process. The specific heat capacity of a crystal can be approximated by three times this quantity, divided by the molar mass, according to the Dulong-Petit Law. It is equivalent to the product of Avogadro's number and the Boltzmann constant, and equals 8.314 joules per mole Kelvin. It is multiplied by temperature in the Arrhenius equation, the Nernst equation, and the equation that describes its namesake fluids. For 10 points, what fundamental constant symbolized R is used to unify such equations as Charles' Law, Gay-Lussac's Law, and Boyle's Law?

ANSWER: ideal **gas constant** [or universal **gas constant**; prompt on **R** before mentioned]

034-09-12-19110

10. One person nominated by this group was known for his longtime feud with Secretary of the Navy Gideon Welles. That man was John P. Hale. The political cartoon "Shooting the Christmas Turkey" shows another candidate from this party as a fox grabbing the turkey while two candidates from other parties bicker. This group's slogan was coined by Salmon Chase and they nominated one candidate at Lafayette Square, Buffalo. Conscience Whigs and Barnburners were the major factions of this group. In 1848, they nominated Martin Van Buren for the presidency. For 10 points, name this 19th century American political party that opposed the expansion of slavery.

ANSWER: **Free Soil** Party

064-09-12-19111

11. A 1931 conflict regarding this river dealt with the construction of a new toll bridge, which angered Governor Ross Sterling. Forks in this river include Prairie Dog Town Fork. General Lucius D. Clay managed the construction of the Denison Dam on this river. This river was once jammed by a collection of fallen trees running over 150 miles until Captain Henry Miller Shreve cleared the "Great Raft" jamming this river and its tributary, the Atchafalaya, in Louisiana. While also flowing through Arkansas, it once separated U.S. and Spanish territory as declared in the Adams-Onis Treaty. For 10 points, name this colorfully named river, a tributary of the Mississippi, which forms the boundary between Texas and Oklahoma.

ANSWER: **Red** River

052-09-12-19112

12. One story by this author is punctuated by the sound of corks popping out of bottles placed next to a fire, and ends with Crofton approving a poem recited by Joe Hynes. In another story by this author, Maria loses a plum cake on a tram and sings "I Dreamt That I Dwelt in Marble Halls" after touching a "soft wet substance" while blindfolded. This author described the sudden revelations that strike many of his characters as "epiphanies." In another of this author's stories, Bartell D'Arcy's song "The Lass of Aughrim" causes the protagonist's wife Gretta to remember her young lover Michael Furey. For 10 points, name this author of "Clay," "Ivy Day in the Committee Room," and "The Dead," which appear in his collection *Dubliners*.

ANSWER: James **Joyce**

015-09-12-19113

13. Thirty brief interludes about this figure, some of which are meetings with Michele Besso, appear in a book of this man's "Dreams" by Alan Lightman. John Stachel and Martin Klein edited several volumes of this man's writings for his namesake "Papers Project." Along with Bertrand Russel, this man drafted a manifesto that predicated the Pugwash Conferences and calls for people to "Remember [their] humanity, and forget the rest" to avert the "utter disaster" of nuclear war. Another document written by this man and Leo Szilard called on FDR to begin work on an atomic bomb before Nazi Germany could. For 10 points, name this former patent clerk and anti-nuclear activist, a legendarily intelligent German physicist who developed the theory of relativity.

ANSWER: Albert **Einstein**

003-09-12-19114

14. The failed Pombo Amendment aimed to "improve deterrence" of this practice. The Page Act allowed searches of ships if this activity was suspected. A 1986 act of Congress gave amnesty to people who had been doing it since 1982. California's Proposition 187 prohibited medical care to people engaging in this activity, which was first defined by the Chinese Exclusion Act. The bracero program was ended partly because there was no good way to separate the braceros from individuals engaging in this activity. For 10 points, name this activity protested by the Minutemen, which is the undocumented entry of foreign nationals into the United States.

ANSWER: **illegal immigration** [or obvious equivalents]

003-09-12-19115

15. This author described his longtime inability to write about his adopted home of California in the introduction to "Christ Walked Down Market Street." In one of his novels, the hitman Albert Cluveau is hired to kill the black political leader Ned; in another novel by this author, the gift of a radio allows the teacher Grant Wiggins to connect with his student, who has been compared to a hog by his attorney. He claimed that classical music cannot describe the Louisiana State Penitentiary as well as the blues in his collection *Mozart and Leadbelly*, and wrote about a character who leads a march to Bayonne to protest a segregated water fountain at the age of one hundred and ten. For 10 points, name this author who wrote about the falsely convicted Jefferson in his tales of black life in Louisiana, which include *The Autobiography of Miss Jane Pittman* and *A Lesson Before Dying*.

ANSWER: Ernest James **Gaines**

019-09-12-19116

16. This work notes that precious metals such as gold and silver do not rot, thus they can be used in exchange for goods that do. This work supports the ability for men to "impound" as much as can be reaped from his labor in its section "Of Property." Published with a work that refutes every point in Filmer's *Patriarcha*, this work claims that by overstepping its power, a state voids the social contract. Stating that the state of nature "however free," is "full of continual dangers," for 10 points, name this influential work of political philosophy by John Locke.

ANSWER: "**Second Treatise of Government**" [prompt on *Two Treatises of Government*, and cut off anyone who tries to supply the full title; accept "**Second Treatise on Government**"; accept descriptive answers]

020-09-12-19117

17. In 1947, political dissidents in this nation were massacred in what is known as the 228 incident. European explorers encountered the Ami and Atayal indigenous tribes while settling this modern nation and the western portion of this nation contains the strategically important Pescadore Islands. This nation was the home to the Dutch Fort Zeelandia, although it was eventually captured following a long siege led by Koxinga. Later, this nation became one of the Asian Economic Tigers and during the Cold War it was controlled tightly by the KMT party. For 10 points, name this island nation once known as Formosa.

ANSWER: **Taiwan** [or **Formosa** early]

064-09-12-19118

18. One of this novel's narrators is infuriated at the sound of an adze going "one lick less," and imagines protecting his mother by climbing up a hill and throwing rocks at other people's faces. At the end of this novel, another character repeats the words "Yes yes yes yes yes" while being taken to an insane asylum for setting fire to Gillespie's barn. A carpenter in this novel has cement poured on his broken leg at Mottson after his father trades for a new team of mules from Flem Snopes. The central family of this novel includes the illegitimate son of Reverend Whitfield, a boy who narrates a chapter consisting of the sentence "My mother is a fish," and a father who finally procures false teeth after arriving in Jefferson. For 10 points, name this novel about Vardaman, Dewey Dell, Cash, Darl, and Anse Bundren's journey to bury their matriarch Addie, written by William Faulkner.

ANSWER: *As I Lay Dying*

024-09-12-19119

19. Two models of this action are the zipper and sinking hypotheses. Lactoferrin stimulates this activity and sometimes can be found in an organelle resulting from this. C3b is one element that can cause opsonization to better allow for this process to occur. Like related processes, it is triggered by Fc receptors. Microglia, neutrophils and monocytes are cells that perform this action. Some protists use this process to acquire food, but its also used as immune response against bacteria. For 10 points, name this form of endocytosis where a cell engulfs a particle or other cell.

ANSWER: phagocytosis

001-09-12-19120

20. The Repertory Grid is a theory of this phenomenon which was devised by George Kelly and uses factor analysis to determine it. One person to study this posited the "lexical hypothesis" which created broad classifications of cardinal, central, and secondary traits. Gordon Allport was an early researcher of "trait theory" in this field, and Raymond Cattell developed a 16 factor model of it. One model of this phenomenon was promulgated by Lewis Goldberg, is remembered with the OCEAN mnemonic, and includes the divisions Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Those are known as the Big Five factors of this concept. For 10 points, name this psychological phenomenon which is measured by a Minnesota Multiphasic Inventory.

ANSWER: personality

015-09-12-19121

21. In the early fifteenth century, supporters of the Count of Armagnac fought a civil war against supporters of the ruler of this territory. The Cistercian order was founded in this territory's Cîteaux monastery. Claus Sluter sculpted the *Well of Moses* for this territory's monastery Charteuse de Champmol. The monastery of Cluny was founded in this territory. The wars named for this territory effectively ended after the Battle of Nancy, which resulted in the death of this region's ruler Charles the Bold. For 10 points, name this French territory ruled by Philip the Good, whose capital was Dijon.

ANSWER: Duchy of Burgundy

004-09-12-19122

22. In this novel, the grocer Greff hangs himself in an ingenious manner that involves a counterweight of potatoes and a cacophony of noise. The protagonist is arrested after Gottfried von Vittlar's testimony, and one character in this novel dies because he falls in love with a ship's figurehead named Niobe. Another character dies by choking when he swallows a party pin. The protagonist's lovers include Sister Dorothea, whose severed finger he later finds, and Maria, who gives birth to his son Kurt. The protagonist of this novel can shatter glass with his voice and stops growing at the age of three. For 10 points, name this novel about Oskar Matzerath [MAHT-zer-aht] by Günter Grass.

ANSWER: *The Tin Drum* [or *Die Blechtrommel*]

024-09-12-19123

23. Sufferers of this disease are unable to produce hypothiocyanate, and eighty percent of patients with this disease eventually harbor *P. aeruginosa* by age 18. Sufferers also have congenital absence of the vas deferens, and screening for this disease involves measuring an elevated level of immunoreactive trypsinogen followed by a sweat test. The gene mutated in this disease produces a non-functional protein that does not fold perfectly due to a delta-508 deletion; that gene is a chloride channel. For 10 points, name this genetic disease which results in the buildup of thick mucus in the lungs.

ANSWER: **cystic fibrosis** [or **CF**]

048-09-12-19124

1. Inverting this property is the same as reversing all spatial coordinates in a system and, for many systems, is the same as replacing particles with their corresponding anti-particles. For 10 points each:

[10] Name this property that was thus long considered to comprise a fundamental symmetry along with charge conjugation, or C.

ANSWER: spatial **parity** [prompt on **P**]

[10] The first violation of CP symmetry was detected in the kaon decays because kaons contain this quark. Named because it imparts to particles abnormally long lifetimes, it comprises the second generation along with the charm quark.

ANSWER: the **strange** quark

[10] Sakharov included CP violation as one of the three conditions for primordial production of these subatomic particles. They are composed of three quarks and include the proton and neutron.

ANSWER: **baryons**

064-09-12-19201

2. This collection's penultimate work is an epic poem supposedly written by Mr. Jonathan Swift Somers which was planned for twenty four books but ends abruptly with the phrase "Bent on the." For 10 points each:

[10] Name this collection which includes the poems "Professor Newcomer," "Indignation Jones," and "Sexsmith the Dentist."

ANSWER: ***Spoon River Anthology***

[10] *Spoon River Anthology* was written by this American poet who also wrote a biography of Vachel Lindsay.

ANSWER: Edgar Lee **Masters**

[10] This first poem of *Spoon River* asks "Where are Elmer, Herman, Bert, Tom and Charley" and concludes that they are "sleeping, sleeping, sleeping" at the title location.

ANSWER: "The **Hill**"

015-09-12-19202

3. One example of these structures is M87. They comprise the convergent, left branch of the Hubble tuning fork. For 10 points each:

[10] Name this type of galaxy that has no spiral structure and looks smooth through a telescope.

ANSWER: **elliptical** galaxies

[10] The Faber-Jackson relation for elliptical galaxies relates the velocity dispersion to this measure of the energy radiated per unit time.

ANSWER: the **luminosity** [prompt on **L**]

[10] The velocity dispersion can also be used to determine the mass of an elliptical galaxy by using this theorem which for self-gravitating bodies states that the total kinetic energy is half the gravitational potential energy.

ANSWER: the **virial** theorem

001-09-12-19203

4. This painting was exhibited along with its artist's *Le Pont de L'Europe* at the third Impressionist exhibition. For 10 points each:

[10] Name this 1877 painting that portrays an elegantly dressed couple carrying an umbrella on a sidewalk near the Place de Dublin, one of the new boulevards designed by Baron Haussmann.

ANSWER: Paris Street, Rainy Day [or Paris: A Rainy Day; or Paris Street, Rainy Weather; or Rue de Paris, temps de pluie; or La Place de l'Europe, temps de pluie]

[10] The painter of *Paris Street, Rainy Day*, Gustave Caillebotte, is depicted wearing a straw hat in the bottom right of *The Luncheon of the Boating Party*, a canvas by this artist of *Girl with a Watering Can*.

ANSWER: Pierre-Auguste **Renoir**

[10] Caillebotte paid the rent for Claude Monet's Paris studio, but many of Monet's best-known works, such as his *Lily Pads* and *Haystacks* series, were executed at his home in this French town.

ANSWER: **Giverny** (ZHEE-vair-nee)

004-09-12-19204

5. In this process, aconitase dehydrates and rehydrates the namesake molecule to produce an isomer of it. For 10 points each:

[10] Name this process whose intermediates include oxaloacetate and malate, the latter of which is converted to fumarate using FAD.

ANSWER: **citric acid** cycle [or **Krebs** cycle; or **TCA** cycle]

[10] This molecule formed from pyruvate enters the Krebs cycle by combining with oxaloacetate to produce citrate.

ANSWER: **acetyl CoA** [or **acetyl coenzyme A**]

[10] If oxaloacetate is not available to react with it, then acetyl CoA enters pathways that result in ketosis and acidosis, conditions common in sufferers of this disease in which the body cannot regulate its blood sugar levels.

ANSWER: **diabetes**

032-09-12-19205

6. A 1790s US insurrection was caused by an unpopular excise tax. For 10 points each:

[10] Name that rebellion in Western Pennsylvania, which was named for a certain beverage.

ANSWER: **Whiskey** Rebellion

[10] Washington put down the rebellion with the aid of this man, who operated in the southern theater of the Revolutionary War. His nickname came from his competent equestrian skills.

ANSWER: Henry **Lee** III [or "Lighthorse Harry" **Lee**]

[10] The rebellion started after shots were fired at this Pennsylvania tax collector while he was leading a US marshal through the area.

ANSWER: John **Neville**

064-09-12-19206

7. This character's lover describes her as "a rebel from the waist down." For 10 points each:

[10] Name this lover of Winston Smith in George Orwell's *1984*.

ANSWER: **Julia**

[10] In *1984*, Oceania is a dictatorship ruled by this possibly mythical founder of the Party, who is opposed by Emmanuel Goldstein. Posters throughout Oceania warn that he "is watching you."

ANSWER: **Big Brother**

[10] Julia belongs to this youth organization, whose members wear red sashes around their waists symbolizing their chastity, and report people who have intercourse to Big Brother.

ANSWER: Junior **Anti-Sex League**

059-09-12-19207

8. Along with Jean-Pierre Gorin, this man founded the Dziga Vertov group which paid homage to the great Russian director. For 10 points each:

[10] Name this French filmmaker whose films include a dystopian film noir about secret agent Lemmy Caution entitled *Alphaville*, a surrealistic 1987 version of *King Lear*, and a film about a playwright's estrangement from his Brigitte Bardot-played wife, *Contempt*.

ANSWER: Jean-Luc **Godard**

[10] Godard's most important film is this 1960 movie starring Jean-Paul Belmondo as a criminal who idolizes Humphrey Bogart and is killed after being betrayed by his American girlfriend Patricia.

ANSWER: **Breathless** [or *A bout de souffle*]

[10] Godard was a director from the New Wave film movement of the late 1950s and 1960s, which took place in this country, and included such directors as Francois Truffaut and Alain Resnais.

ANSWER: **France** [or **French Republic**; or **République française**]

052-09-12-19208

9. For 10 points each, answer the following about wedding gifts that really should have been sent back.

[10] Hephaestus gave this cursed object as a wedding gift to Cadmus's wife. Later, it was used to bribe Eriphyle into convincing her husband Amphiaraus to go to war against Thebes.

ANSWER: **necklace of Harmonia** [or equivalent]

[10] This daughter of King Creon of Corinth perished along with her father after trying on a cursed dress given as a wedding gift by Medea, the former wife of Jason.

ANSWER: **Glauce** [or **Creusa**]

[10] Eschewing the gifts for the bride and groom, Eris rolled this object, marked "For the Fairest," into the wedding of Peleus and Thetis. Aphrodite, Athena, and Hera all laid claim to it.

ANSWER: golden **apple of discord** [prompt on **apple**; prompt on **golden apple**]

003-09-12-19209

10. In the late eighteenth century, a controversy over this belief arose between Friedrich Jacobi and Moses Mendelssohn. For 10 points each:

[10] Name this belief which equates God with the universe. Unlike theism, it denies that a personal God who transcends the world exists.

ANSWER: **pantheism**

[10] This seventeenth century Dutch philosopher defended pantheism in his *Ethics*.

ANSWER: Baruch **Spinoza**

[10] Charles Hartshorne and Alfred North Whitehead supported this alternative to pantheism, which believes that God not only interpenetrates all of Nature but also transcends it.

ANSWER: **panentheism**

004-09-12-19210

11. In 2005 a group of MIT students demonstrated that this device was theoretically possible, but only if it used an array of flat mirrors instead of a giant parabolic mirror. For 10 points each:

[10] Name this ancient device that, according to legend, was used to burn an invading Roman fleet. It was probably just an exaggeration made up by a Byzantine writer, the real work being done by arrows tipped with Greek fire.

ANSWER: Archimedes's **death ray**

[10] Archimedes's death ray, or the more likely substitute of arrows and Greek fire, was used during the Roman siege of Syracuse, a city on this island that had earlier been the target of a disastrous Greek "expedition."

ANSWER: **Sicily**

[10] The siege of Syracuse began after a power struggle resulting from the death of this ninety-year old tyrant, who had managed to keep Syracuse out of the First Punic War by signing a 263 BC treaty with Rome.

ANSWER: **Hieron II** [prompt on **Hieron**]

003-09-12-19211

12. He worked with Lindahl and Bowen on a set of criteria important to welfare economics and applied Le Chatelier's principle of chemical equilibrium to economics . For 10 points each:

[10] Name this man who influenced whole generations of economists with his textbook *Economics: An Introductory Analysis*.

ANSWER: Paul Anthony **Samuelson**

[10] Paul Samuelson developed much of the theory of this type of good, which is non-excludable and non-rivalrous. Examples include street signs and air.

ANSWER: **public** goods

[10] Much of Samuelson's textbook consists of versions of this man's theories. He argued for government intervention into the economy in his landmark *The General Theory of Employment, Interest and Money*.

ANSWER: John Maynard **Keynes**

059-09-12-19212

13. This novel was originally published as *Number 44*, although it was renamed and heavily edited by Albert Bigelow Paine. For 10 points each:

[10] Name this book in which Satan visits Eseldorf and destroys Theodor's faith in humanity.

ANSWER: *The **Mysterious Stranger***

[10] This other book by Mark Twain mocks the belief in innate racial superiority by describing a murder committed by Tom Chambers, a nearly white slave who was switched at birth with the son of Judge Driscoll.

ANSWER: ***Pudd'nhead Wilson***

[10] In *The Adventures of Tom Sawyer*, this character announces his intent to slit the Widow Douglas' nostrils for having him horsewhipped. Muff Potter was nearly hanged for the murder of Dr. Robinson, a crime for which this character was actually responsible.

ANSWER: Injun **Joe**

030-09-12-19213

14. This battle took place three years after the massacre of Arthur St. Clair's army by the forces of Little Turtle. For 10 points each:

[10] Name this 1794 victory for Anthony Wayne that took place in Northern Ohio.

ANSWER: Battle of **Fallen Timbers**

[10] The Battle of Fallen Timbers led to the signing of this 1795 treaty that saw Native American leaders cede territory in present day Michigan, Ohio, and Illinois.

ANSWER: Treaty of **Greenville**

[10] 27 years after the Battle of Fallen Timbers, this 1811 battle saw forces of Tenskwatawa defeated by William Henry Harrison during Tecumseh's War.

ANSWER: Battle of **Tippecanoe**

064-09-12-19214

15. The targets of these events had to wear a *sanbenito* and carry a taper of yellow wax. For 10 points each:

[10] Name these public ceremonies performed by the Spanish Inquisition, in which accused heretics who refused to confess were burned alive.

ANSWER: **auto-da-fé** [or **autos-da-fé**; or **act of faith**; or **acts of faith**]

[10] One target of the Spanish Inquisition was this group of Spanish and Portuguese Jews, who pretended to convert to Christianity in order to save their lives but secretly practiced Judaism. This group's name originated as a Spanish epithet meaning "swine."

ANSWER: **marranos**

[10] This Dominican friar staged the LaGuardia trial to convince Ferdinand and Isabella to expel the Jews from Spain. His cruelty against marranos as the first head of the Spanish Inquisition may have stemmed from his grandmother's status as a Jewish convert.

ANSWER: Tomas de **Torquemada**

004-09-12-19215

16. One work by this man shows the subject holding out his right hand while he holds the title object in his left hand. For 10 points each:

[10] Name this "Elder" Greek sculptor of the *Discophoros* and the *Doryphoros* or *Spear-Bearer*.

ANSWER: **Polykleitos**

[10] *Discophoros* should not be confused with *Discobolus*, a sculpture of a man preparing to throw a discus, which was produced by this other Greek sculptor.

ANSWER: **Myron**

[10] Polykleitos's *Doryphoros* exemplifies the aesthetic theory laid out in his *Kanon*, central to which is this type of pose in which a figure rests his weight on one leg so that the shoulders and hips are twisted relative to each other.

ANSWER: **contrapposto**

064-09-12-19216

17. Many chemical compounds possess hydrophobic and hydrophilic regions. For 10 points each:

[10] Detergents and shampoos contain these compounds that lower the surface tension of a liquid.

ANSWER: **surfactants**

[10] Surfactants form these spherical structures that trap hydrophobic material in the interior and surround it with the hydrophilic region of the surfactant, where it can then be washed away with water.

ANSWER: **micelles**

[10] These other spherical lipid structures are similar to micelles except they are a bilayer. They are often used for transfections and drug delivery.

ANSWER: **liposomes**

064-09-12-19217

18. This nation contains the eastern portion of the Zagros mountains. For 10 points each:

[10] Name this nation that also contains the large cities of Esfahan, Tabriz, and Tehran.

ANSWER: Islamic Republic of **Iran**

[10] This other mountain range in Iran contains Mount Damavand and runs across northern Iran.

ANSWER: **Alborz** mountains

[10] The Alborz mountains skirt the shore of this sea that indents northern Iran. Its northern end borders Russia.

ANSWER: the **Caspian** Sea

026-09-12-19218

19. One example of these is the heat equation. Separable ones can be solved using separation of variables. For 10 points each:

[10] Name this equations that involve an unknown function and its derivatives. They can be which can be ordinary or partial.

ANSWER: **differential equations** [accept **DEs**; accept ordinary **differential equations** or **ODEs**; accept partial **differential equations** or **PDEs**]

[10] Differential equations can be classified by this value, dictated by the highest derivative that appears in the reduced equation. For a polynomial, it is equal to the power of the highest-degree non-zero term.

ANSWER: the **order**

[10] This function is the solution y of x of the separable, first-order differential equation y -prime plus y equals 0.

ANSWER: the **negative exponential** function (or **decaying exponential**; accept answers of the form "constant times **e** to the **minus x**"; prompt on **exponential**)

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20. Commentaries on this book have included those written by Ho-shang Kung and Wang Pi. For 10 points each:

[10] Name this text that introduced the concept of ziran, or naturalness, which was allegedly written for the border guard Yin Xi.

ANSWER: **Tao Te Ching** [or **Lao Tzu**]

[10] This man probably wrote the *Tao Te Ching*, which is sometimes instead named after him, and he is an important figure in Taoism.

ANSWER: **Lao Tzu** [or **Laozi**]

[10] This Taoist philosopher is often quoted by anarchists and evolutionists alike, once presumed to know what fish enjoy, and experienced the oft-written about "Butterfly Dream."

ANSWER: **Zhuangzhi** [or **Chuang Tsu**; or Master **Chuang**]

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21. The protagonist of this novel falls in love with Catherine Maheu, a girl who dies of suffocation after a mine accident. For 10 points each:

[10] Name this novel about Etienne Lantier, the thirteenth in the Rougon-Macquart series.

ANSWER: **Germinal**

[10] This author of *Nana* and *Germinal* wrote about a woman who plots with Laurent to kill her husband and cousin Camille in *Therese Raquin*.

ANSWER: Emile **Zola**

[10] This Zola novel sees Claude Lantier become obsessed with creating a perfect work of art and his eventual suicide despite the best efforts of his wife, Christine Hallegrain.

ANSWER: *The* **Masterpiece**

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