

## ACF Regionals 2017

Edited by Andrew Hart, Stephen Liu, Benji Nguyen, Adam Silverman, Cody Voight, Nathan Weiser

Tossups by Chicago A (John Lawrence, Max Schindler, Jason Zhou, Athena Kern) and Cornell A (Sean McBride, Soham Agarwal, Jackson Harper, Irene Lin)

1. Supposed “supplements” to this text, published by François Nodot (noh-doh) and José Marchena, were later shown to be forgeries. One man’s description of his future tomb to the stonemason Habinnas in this text causes him, his wife, and an entire household to cry. This text ends with a man reading a will stating that only those who consume his body can be his heirs. In this text, the narrator’s friend Ascyrtos (as-KILL-tos) flees a speech being given outside a school and attempts to have sex with the narrator’s lover. The poet Eumolpus (yoo-“MOLE”-pus) appears in this text, whose protagonists are tortured by followers of a cult of Priapus and are invited to a dinner hosted by the freedman Trimalchio (trih-MAHL-kee-oh). For 10 points, name this Roman text about Encolpius and his lover, Giton, that was written by Gaius Petronius Arbiter.

ANSWER: Satyricon [or Satyricon liber]

2. These organisms use the noncanonical amino acids B·M·A·A and A·D·D·A to make toxic microcystins (“micro”-SIS-tins). Species of these organisms are numbered in the Pasteur culture collection—for example, PCC 6803, which is a model organism. An icosahedral microcompartment first discovered in these organisms receives Ru·B·P through a capsid-like shell and converts it to 3-phospho·glycerate. Stromatolites are biofilms composed mostly of these organisms. Lynn Margulis compared thylakoids to the carboxy·somes and light-harvesting centers in this phylum. More than two billion years ago, these organisms caused the Great Oxygenation Event. Endosymbiosis predicts that chloroplasts originated as these organisms. For 10 points, name this phylum of photosynthetic bacteria often erroneously called blue-green algae.

ANSWER: cyanobacteria [or cyanobacterium; accept blue-green algae before “blue-green”; prompt on “bacteria” or “bacterium” or “prokaryotes”; do not accept or prompt on “algae”]

3. A set of handscrolls illustrating this ruler’s armies in battle shows the use of “thunder crash bombs,” an early form of explosive shell launched from catapults. To overcome a fear of this ruler, a leader consulted his religious adviser, Mugaku Sogen (moo-GAH-koo SOH-gen), who urged the leader to scream “victory” until his fear subsided. This ruler’s fleet was defeated at the Battle of Bach Dang (“botch” dahng) by the Tran dynasty, which later joined with the Champa kingdoms in accepting this man’s supremacy over Vietnam. After annexing the Goryeo Kingdom, this ruler used Korean shipbuilders to prepare for an invasion spurred by Hojo Tokimune’s (toh-kee-MOO-nay’s) impudence. His fleets were twice destroyed by typhoons referred to as “divine wind.” Two failed invasions of Japan were ordered by, for 10 points, what first emperor of the Yuan dynasty?

ANSWER: Kublai Khan [or Kubilai Khan; or Yuan Shizu]

4. French artist ORLAN (or-LAHN) created an edgy, nearly identical version of this painting, renamed so that the last word of its title is “war.” Deborah de Robertis was arrested in 2014 for a piece of performance art that involved sitting in front of this painting in a gold dress. A modern parody of this work by Tanja Ostojić (TAHN-yah oh-STOH-yitch) includes an article of clothing with the European Union flag on it. This painting, which was commissioned by Khalil Bey, was purchased in 1955 by the psychoanalyst Jacques Lacan. The recently discovered upper half of this work confirmed that its model was likely Joanna Hiffernan. Only one breast of this work’s splay-legged subject is visible, as the other is covered by white fabric. For 10 points, name this painting by Gustave Courbet that depicts a woman’s naked lower half.

ANSWER: The Origin of the World [or L’Origine du monde]

5. When this goddess was refused from Rhodes, she drove the sons of Poseidon and Halia mad, causing them to rape their own mother and be buried alive as punishment. In the *Odyssey*, the Phaeacian (fee-AY-shan) bard Demodocus sings of the humiliation of this goddess, whose Homeric epithets include *Philomeides* ("FIE"-low-may-dees), or "laughter-loving." Hera cursed this goddess to give birth to an ugly and impotent son whom she conceived with Dionysus. This goddess, the mother of the constantly erect god Priapus, entrusted Persephone with a chest holding a youth who had been born from a split myrrh tree, but she later feuded with Persephone over the boy's love. That youth, a lover of this goddess, was gored to death by Ares in the form of a boar. For 10 points, what lover of Adonis was the Greek goddess of love?

ANSWER: **Aphrodite** [accept **Venus** until "Greek" is read]

6. Two married artists from this modern-day country documented the internal beauty of industrial structures by creating photographic typologies, presented in rectangular arrays, of visually similar gas tanks or water towers. Crowds at art museums were depicted in the series *Museum Photographs* by an artist from this country. Another artist from this country portrayed the horizontality of shelves laden with mass-produced products in his photographic diptych of a 99-cent store. Thomas Struth (toh-MAS STROOT) and Andreas Gursky are from this country, whose bombed-out capital appears in a photo of soldiers raising the Soviet flag above its national legislative building. Bernd and Hilla Becher were from, for 10 points, what country home to the Düsseldorf School and the Reichstag?

ANSWER: **Germany** [or Federal Republic of **Germany**; or Bundesrepublik **Deutschland**]

7. This author drew a frontispiece for one of his novels in which a fool looks at his reflection in a cracked mirror. The Fairy Blackstick helps the true heirs of Paflagonia and Crim Tartary marry and distributes the title beauty-granting magical objects in one of this author's novels. This author coined the term "Oxbridge" in a novel whose title character marries his foster sister Laura Bell and refuses to take Sir Clavering's Parliament seat through blackmail. This author of *The Rose and the Ring* and *The History of Pendennis* created a woman who idealizes her husband George Osborne, who dies in the Waterloo Campaign. The anti-heroine of this man's "novel without a hero" marries Rawdon Crawley and befriends Amelia Sedley. For 10 points, what author created Becky Sharp in *Vanity Fair*?

ANSWER: William Makepeace **Thackeray**

8. Each of these operations should have an associated converse limitation theorem called a tauberian theorem. Specially designed means are used in Nørlund's, Abel's, and Cesàro's methods for this operation. An integral with error terms given by Bernoulli numbers is equated to this operation by the Euler–Maclaurin formula. In one instance, zeta-function regularization and Ramanujan's example of this operation yield minus one-twelfth. One can obtain a value of one-half for Grandi's series, which consists of alternating plus-ones and minus-ones, by taking the arithmetic mean of partial examples of this operation. For 10 points, what operations assign a finite value to a divergent series and are symbolized by a big sigma because they should yield the expected result for a convergent series?

ANSWER: **summation** methods for divergent series [or **summability** methods; accept **regularization** before "regularization"; accept equivalents such as **assigning a value to a divergent series** before "assign"]

9. During this man's ministry, a bribery scandal arising out of the escape of convicted drug dealer Lucien Rivard brought about the resignation of his attorney general Guy Favreau. This prime minister's government set up the Laurendeau–Dunton Commission to study bilingualism and biculturalism. After he criticized the bombing of North Vietnam at Temple University, he was told by Lyndon Johnson not to "come into my living room and piss on my rug." This successor to Louis St. Laurent as party leader accepted the Bomarc missile program and instituted universal healthcare. As the minister of external affairs, he won a Nobel Peace Prize for helping to resolve the Suez Crisis. For 10 points, what Liberal prime minister of Canada served in the 1960s and was succeeded by Pierre Trudeau?

ANSWER: Lester **Pearson** [or Lester Bowles **Pearson**; accept Mike **Pearson**]

10. Sayings of and speeches by this man were collected by al-Sharif al-Radi. This man requested to be buried in secret so that his body wouldn't be desecrated by his enemies, so it is disputed whether he lies in Mazar-e-Sharif or Najaf. This man's words are collected in the *Nahj al-Balagha*, or *Peak of Eloquence*. A dispute about this man centers on the use of the term "mawla," or "master," in a proclamation issued near a pond in Ghadir Khumm. While this man was praying, a Kharijite wielding a poisoned sword assassinated him. He wielded the sword Zulfiqar (ZOOl-fee-kar) during his victories at Badr and Khaybar. Fatima was married to, for 10 points, what son-in-law of Muhammad who is considered by Shias to be the first imam and is recognized by Sunnis as the fourth of the rightly guided caliphs?

ANSWER: Ali [or Ali ibn Abi Talib; or Ali bin Abi Talib]

11. This man conducted a study in which participants living near stairways were more likely to make friends on other floors; based on that study, he posited that "propinquity," or proximity, was more important to forming friendships than shared beliefs or interests. Participants in another of this man's studies reported that a boring activity was more enjoyable when, after they completed the activity, they were paid a small amount, rather than a large amount, to tell another person that the activity wasn't boring. He is the alphabetically first author of a book profiling the "Seekers," a UFO cult whose doomsday prediction did not come true. For 10 points, what psychologist devised the theory of cognitive dissonance and, with Henry Riecken and Stanley Schachter, wrote *When Prophecy Fails*?

ANSWER: Leon Festinger

12. Kaikhosru Sorabji (kai-KOHS-roo soh-RAHB-jee) retired from performing after premiering the second of his four pieces of this type. Aram Khachaturian (kah-chah-TOO-ree-ahn) wrote an E-flat-minor piece of this type for solo piano that was meant to form a three-part suite with a waltz-capriccio and a dance. One piece of this type for piano begins with the hands alternating as they rapidly hit a D note. Robert Schumann said that the hardest composition ever written was his own Opus 7, a piece of this type. Charles-Marie Widor (SHAR-leh mah-REE VEE-dor) composed one of these pieces for the final movement of his Fifth Organ Symphony. One piece of this type begins with a buildup to a diminished seventh chord and is the first section of a two-part piece featured in the opening of *Fantasia*. For 10 points, what type of piece was paired with a fugue in D minor by J. S. Bach?

ANSWER: toccata

13. This man wrote of a so-called painter who calls himself the "final barber, the last beautician" in one of 22 dramatic monologues spoken by Death in his collection *Flight Among the Tombs*. The German epigraph "we have a law, and according to the law he must die" precedes a poem by this man, which prophesies that a murdered boy "will walk in as you're sitting down to a meal" and is titled "The Book of Yolek." The title figure in a poem by this man "said one or two unprintable things" after she was brought "all the way down from London" and addressed as a "mournful cosmic last resort." This man wrote about a woman who "had read Sophocles in a fairly good translation" and thus caught the "bitter allusion to the sea" in a Matthew Arnold poem. For 10 points, what British poet wrote "The Dover Bitch"?

ANSWER: Anthony Hecht [or Anthony Evan Hecht]

14. The citrus company Hanotea negotiated a deal with the German government on behalf of this movement, creating a financial transfer service called Haavara. An Okhrana (oh-KRAH-nah) agent based in Paris may have authored a document, purporting to outline this movement's operations, that heavily plagiarized a political satire by Maurice Joly (zhoh-lee). Joseph Chamberlain's Uganda Proposal offered this movement an alternative to its main goal of *aliyah*. In Britain, this movement was led by Chaim Weizmann ("HIE"-im VITES-mahn) and Walter Rothschild, the latter of whom received the Balfour Declaration. A forgery called the "protocols" of this movement's "elders" claimed that it was a plot to take over the world. For 10 points, name this movement led by Theodor Herzl that sought to establish a Jewish homeland in Israel.

ANSWER: Zionism [accept forms of the word Zionist; prompt on Judaism]

15. In the Lorentz gauge, the inhomogeneous wave equation for  $\phi$  has a right-hand side consisting of this quantity in the numerator. To find the scalar retarded potential, one integrates this quantity evaluated at the retarded time divided by the distance. In the static case, Jefimenko's equation for the electric field reduces to an integral of this quantity as a function of position. The negative time derivative of this quantity equals the divergence of  $\mathbf{J}$  according to the current continuity equation. The differential form of Gauss's law sets the divergence of the electric field equal to this quantity divided by epsilon-naught. A triple integral of this quantity gives the total charge in a region. For 10 points, what quantity, typically denoted  $\rho$ , is the amount of electric charge per unit of volume?

ANSWER: electric **charge density** [accept  **$\rho$**  before "rho"; prompt on "**density**" after "charge"; do not accept or prompt on "density" before "charge"]

16. One of this thinker's books argues that dreams, rather than perception or thoughts, are the "primary phrase of consciousness" in a chapter on "First Steps and First Fluctuations"; that book by this thinker defines its title concept as "efficacious reflection" and is subtitled "The Phases of Human Progress." In another book, this thinker distinguished between intuition as pure absorption in "essence" and intuition inflected by "intent"; in that book, he argued that there is no firm epistemological foundation to build upward from because belief and nonbelief are both "radically incapable of proof," so "philosophy must begin *in medias res*." For 10 points, name this author of *Skepticism and Animal Faith*, who declared that "those who cannot remember the past are doomed to repeat it."

ANSWER: George **Santayana** [or Jorge Agustín Nicolás Ruiz de **Santayana** y Borrás]

17. In 1993, a Democratic member of this state's legislature sarcastically proposed an amendment banning property taxes; Republican legislators voted the amendment in, thereby defunding this state's entire public school system. A politician from this state was confused by Minnesota senator Al Franken's question about the difference between "proficiency" and "growth"; that politician from this state vowed to "help advance God's Kingdom" and claimed that children in Wyoming might need guns to defend themselves from bears. The most populous city in this state implemented charter-school reform under the guidance of Donald Trump's secretary of education, Betsy DeVos. For 10 points, what state's governor, Rick Snyder, declared a state of emergency during the Flint water crisis?

ANSWER: **Michigan**

18. Because actions involving this substance and "the Lip you press" might "end in the Nothing all Things end in," a poem suggests thinking that "you are Today what Yesterday / you were" and that "tomorrow you shall not be less." This substance has "play'd the Infidel" and "robb'd" the speaker of his "Robe of Honor." Although "David's lips are locked," the "Nightingale cries" this word four times "to the Rose." The addressee is urged to "lose your fingers in the tresses of / the Cypress-slender minister" of this substance. This liquid is mentioned in a quatrain that inspired the title of Eugene O'Neill's only comedy with the line "ah, wilderness were paradise enow." Omar Khayyam writes of "a Book of Verses underneath the Bough" with a "loaf of bread" and a jug of, for 10 points, what liquid?

ANSWER: **wine** [prompt on "**alcohol**" or similar answers]

19. A Clifford Berryman cartoon analogizes one of this general's campaigns to Uncle Sam jumping a barbed-wire fence and grumbling "I've had about enough of this." While stationed at Fort Bliss, this subordinate of Frederick Funston learned that his wife and children had died in a house fire. At a February 2016 campaign rally, Donald Trump repeated the debunked claim that this general dipped bullets in pig's blood while fighting Muslim rebels. In this general's highest post, he refused to deploy all-black regiments, such as the Harlem Hellfighters. After the town of Columbus, New Mexico, was attacked, this general led a "Punitive Expedition" to capture Pancho Villa. For 10 points, what commander of the American Expeditionary Force during World War I was nicknamed "Black Jack"?

ANSWER: John **Pershing** [or John Joseph "Black Jack" **Pershing**; prompt on "Black Jack" before it is mentioned]

20. The “pressure” and “materials” gaps explain disparities in the rate of this process. This process occurs via creation of a surface vacancy in the Mars van Krevelen mechanism. In spheres, this process is described by the equation “eta equals one over phi tanh (“tanch”) three phi,” where eta is this process’s effectiveness factor and phi is the Thiele (TEEL-uh) modulus. The namesake base SI unit for the rate of this process is a mole per second. The Langmuir–Hinshelwood (LANG-mweer HIN-shul-“wood”) mechanism assumes this process is limited by the rate of adsorption. The rate of this process is described by a turnover number. It occurs on zeolite beads in a packed-bed reactor in its heterogeneous form. For 10 points, name this process by which reactions are made to go faster by the lowering of their activation energy.

ANSWER: heterogeneous **catalysis** [accept word forms; accept biocatalysis; accept **reaction** rate before “reaction”; prompt on answers mentioning the word “**enzyme**” (or word forms) but not the word “catalyst(s)”]

TB. Hermann–Maguin notation is unusually preferred to Schönflies (“SHOW”-un-flees) point group notation when using this technique. Isomorphous replacement of uranium improves this technique’s results. The precision of this technique is reported as an “R factor,” which is a normalized difference in structure factors. The analyte is ground into a powder in the Debye–Scherrer (deh-BYE SHUR-ur) form of it. Dorothy Hodgkin was a pioneer of this technique, which occurs in a goniometer (goh-nee-AH-met-ur) that spins the sample tube so that one can find the glide planes, the screw axes, and the Miller indices. The von Laue (vawn LAW-uh) and Bragg equations give mathematical backing for this technique, which is used to solve protein structures. For 10 points, name this analytical technique in which high-energy radiation diffracts through an ordered sample.

ANSWER: **X-ray diffraction** [or **XRD**; or X-ray **crystallography**; prompt on “**diffraction**”]

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Bonuses by Chicago A (John Lawrence, Max Schindler, Jason Zhou, Athena Kern) and Cornell A (Sean McBride, Soham Agarwal, Jackson Harper, Irene Lin)

1. This woman analyzed the national character of the protagonists of three classic American novels in her book *The Republic of Imagination*. For 10 points each:

[10] Name this contemporary author who wrote a 2003 memoir that describes being a literature professor during a revolution in her country and that is titled for “reading *Lolita*” in her country’s capital.

ANSWER: Azar **Nafisi** (nah-FEE-see)

[10] Nafisi is an author from this country, the setting of her memoir *Reading Lolita in Tehran*.

ANSWER: **Iran** [or Islamic Republic of **Iran**; or Jomhuri-ye Eslami-ye **Iran**]

[10] Among the three American novels discussed in Nafisi’s *The Republic of Imagination* is this 1940 book, in which John Singer fails to prevent Spiros Antonapoulos from being committed to a mental asylum.

ANSWER: *The **Heart Is a Lonely Hunter*** [by Carson McCullers]

2. A 1990 *New Yorker* piece by Ian Frazier details a \$38 million personal injury civil action filed against this company by its biggest client. For 10 points each:

[10] Name this company whose products, such as exploding tennis balls and rocket-powered roller skates, are integral to Wile E. Coyote’s outlandish schemes to capture the Road Runner.

ANSWER: **Acme** Corporation

[10] The film *Who Framed Roger Rabbit?* centers on the murder of Acme’s founder, who is killed in this manner. In the Road Runner cartoons, Wile E. Coyote often steps out of a small door after being injured in this manner.

ANSWER: a **safe** falls on him [accept any answer mentioning a falling **safe** or **lock box** or being hit in the head with a **safe** or **lock box**; do not accept or prompt on answers mentioning “anvils”]

[10] In the 1958 Road Runner cartoon *Whoa, Be-Gone!*, Wile E. Coyote purchases a “giant” one of these products from Acme, whose packaging notes that it is “for tripping road-runners.” Wile E.’s scheme goes awry when he loops this product around two rocks, causing them to smash into him from both sides.

ANSWER: **rubber bands** [accept Acme Giant **Rubber Band** (For Tripping Road-Runners)]

3. Answer the following related to modern writings on African American social identity. For 10 points each:

[10] This author of “My President Was Black” and *Between the World and Me* wrote an essay in *The Atlantic* in which he argued for reparations to black Americans in order to “reckon with our compounding moral debts.”

ANSWER: Ta-Nehisi **Coates** [or Ta-Nehisi Paul **Coates**]

[10] This term was coined by legal scholar Kimberlé Crenshaw in her explorations of domestic violence and rape involving black women. Broadly, this phenomenon examines the overlapping of multiple social identities.

ANSWER: **intersectionality** [accept **intersectional** feminism or forms of the word **intersectional**]

[10] This intersectional feminist, who was born in Kentucky and teaches at Stanford, wrote works such as *We Real Cool: Black Men and Masculinity* and *Teaching to Transgress*.

ANSWER: bell **hooks** [or Gloria Jean **Watkins**]

4. Unlike most palladium cross-coupling reactions, the Heck reaction involves one of these steps right after the formation of the pi complex, creating a palladium sigma complex. For 10 points each:

[10] Name this common mechanistic step in organometallic chemistry. In the mechanism for the Monsanto and Cativa processes, carbon monoxide undergoes this sort of step to form an intermediate square pyramidal complex.

ANSWER: migratory **insertion** [or word forms; or **inserting** into an alkene; prompt on “**migration**” or word forms]

[10] The insertion in the Heck reaction is followed by two of these reactions to release the desired alkene. In this type of reaction, contrasted with an addition, small molecules are lost and a new pi bond forms.

ANSWER: **elimination** [or reductive **elimination**; or beta-hydride **elimination**]

[10] The regiochemistry of elimination reactions generally follows this rule, which states that the most stable elimination product is the one that has the most highly substituted double bond.

ANSWER: **Zaitsev's** rule [or **Saytzeff's** rule; or other close phonetic equivalents]

5. For 10 points each, answer the following about shenanigans on the U.S.–Canada border.

[10] This bloodless 1838 “war” spilled over from tensions between Maine’s itinerant lumberjacks and the less-than-amused residents of New Brunswick. After Winfield Scott arrived to calm the Americans down, the boundary disputes that led to this conflict were settled in the Webster–Ashburton Treaty.

ANSWER: **Aroostook** War

[10] In 1837, Canadian independence advocate William MacKenzie and some American allies captured the *Caroline* and pushed it off this landmark. Annie Edson Taylor survived traveling over this landmark in a barrel.

ANSWER: **Niagara Falls** [prompt on “**Niagara**” or “**Niagara River**”]

[10] After Joseph Smith’s death, this rival of Brigham Young led a splinter group of Mormons to Lake Michigan’s Beaver Island, where he tried to establish a theocracy. He was assassinated by his own followers in 1856.

ANSWER: James **Strang** [or James Jesse **Strang**]

6. This novel ends with the protagonist recovering from fainting and dazedly hearing a man state “death by misadventure, I’m inclined to believe.” For 10 points each:

[10] Name this novel about Irene Redfield and Clare Kendry, two light-skinned black women. This novel leaves ambiguous if Clare fell out of a window because she was pushed by Irene; because she was pushed by Clare’s racist husband, Jack Bellew; or because the fall was suicidal or accidental.

ANSWER: **Passing**

[10] Nella Larsen’s *Passing* is mostly set in New York but includes a flashback in which Irene and Clare are reunited at the Drayton Hotel in this city. The second part of Richard Wright’s *Black Boy* is also set in this city.

ANSWER: **Chicago**

[10] Larsen’s novel *Quicksand* is about Helga, a half-Danish, half-black woman with this surname. An author with this surname wrote the story “The Bride Comes to Yellow Sky” and the Civil War novel *The Red Badge of Courage*.

ANSWER: **Crane** [accept Helga **Crane** or Stephen (Townley) **Crane**]

7. In this film, a man discovers a woman’s drowned corpse when his fishing hook snags on her submerged car. For 10 points each:

[10] Name this film in which Robert Mitchum plays an evil preacher who hunts down two children for the money their father hid in a stuffed doll.

ANSWER: *The **Night of the Hunter***

[10] In *The Night of the Hunter*, the children eventually seek protection from an elderly woman played by this actress. This muse of D. W. Griffith starred in *Broken Blossoms* and *The Birth of a Nation*.

ANSWER: Lillian **Gish** [or Lillian Diana **Gish**]

[10] Radio Raheem recites *Night of the Hunter’s* “left hand/right hand” monologue in a scene from *Do the Right Thing*, a film by this African American director who also made *25th Hour* and *Malcolm X*.

ANSWER: Spike **Lee** [or Shelton Jackson **Lee**]

8. The chronicle of Olivier de La Marche (oh-liv-YAY de la MARSH) provides a detailed account of a lavish banquet that this man held to promote a crusade against the Ottomans, although no such crusade ever ended up taking place. For 10 points each:

[10] Name this duke of Burgundy who hosted the Feast of the Pheasant. This father of Charles the Bold founded the Order of the Golden Fleece.

ANSWER: **Philip the Good** [or **Philip III** of Burgundy; or **Philippe le Bon**; prompt on “Philip” or “Philippe”]

[10] In 1364, Casimir the Great brought many of his contemporary monarchs to this city to discuss a crusade against the Turks. Festivities at that meeting in this city included a wedding banquet at the house of a merchant named Nicholas Wierzynek (VEER-zin-ek).

ANSWER: **Kraków** [or **Cracow**]

[10] In this country, a series of political meetings called the “banquet campaign” led up to its revolution of 1848. The banquets were organized against Louis Philippe, who ruled during this country’s July Monarchy.

ANSWER: **France** [or Kingdom of **France**; or Royaume de **France**]

9. The comet Shoemaker–Levy 9 was ripped asunder by these forces because it passed inside Jupiter’s Roche limit. For 10 points each:

[10] Name this differential gravitational force that scales with the distance cubed and creates a spherical bulge.

ANSWER: **tidal** forces [or obvious equivalents, such as **tides**]

[10] After the Canis Major dwarf galaxy, this dwarf galaxy is the nearest galaxy to Earth. This galaxy is being disrupted because it passes so close to the galactic center, leaving a tidal tail of stars strewn in its wake.

ANSWER: **Sagittarius** dwarf galaxy

[10] Henrietta Swan Leavitt developed the period–luminosity relationship by observing Cepheids in this near neighbor of the Milky Way.

ANSWER: **Small Magellanic Cloud** [or **SMC**; do not accept or prompt on “Large Magellanic Cloud” or “Magellanic Clouds”]

10. These works frequently attack the Jesuit practice of casuistry (KAZ-oo-ihs-tree). For 10 points each:

[10] Name this series of 18 works that defend Antoine Arnauld and were written under the pseudonym Louis de Montalte.

ANSWER: **Provincial Letters** [or **Lettres provinciales**]

[10] The *Provincial Letters* are by this French philosopher and mathematician. His *Pensées* (pahn-SAYZ) contains his namesake “wager,” which advises believing in God, just in case he exists.

ANSWER: Blaise **Pascal** [accept **Pascal**’s wager]

[10] Pascal’s wager contrasts greatly with this later philosopher’s rule, introduced in “The Ethics of Belief,” that states it is wrong to believe in anything upon insufficient evidence. He is the primary target of William James’s essay “The Will to Believe.”

ANSWER: W. K. **Clifford** [or William Kingdon **Clifford**]

11. This publisher watches Dermot Hoggins throw the critic Felix Finch off a rooftop, causing sales of the book *Knuckle Sandwich* to skyrocket and making this man a lot of money. For 10 points each:

[10] Name this character from *Cloud Atlas* who later escapes from a nursing home called Aurora House. Many years into the future, the fabricant Sonmi-451 watches the film version of this elderly Englishman’s “Ghastly Ordeal.”

ANSWER: **Timothy Cavendish** [accept either underlined portion]

[10] Margaret Cavendish pioneered this literary genre in her 1666 novel, *The Blazing World*, in which a woman enters a parallel universe via the North Pole. Frank Herbert’s *Dune* won the Hugo and Nebula Awards for this genre.

ANSWER: **science fiction** [or **sci fi**; prompt on “**utopian** literature”]

[10] Faith Cavendish, a girl “that didn’t mind doing it once in a while,” is a minor character in this man’s most popular novel. He wrote about the death of the narrator’s brother Kenneth in “The Ocean Full of Bowling Balls.”

ANSWER: J. D. **Salinger** [or Jerome David **Salinger**]



12. The originator of this pedagogical technique reasoned that, if children could master their mother tongue easily, then they should be able to learn music easily. For 10 points each:

[10] Name this method of musical education that emphasizes creating a talent-nurturing environment for a child and practicing a student's "tonalization."

ANSWER: **Suzuki** method [accept answers mentioning Shinichi **Suzuki** or **Suzuki** Shinichi]

[10] Another method of musical pedagogy is the "Schulwerk" (SHOOL-vairk) named after this German composer of *Carmina Burana*.

ANSWER: Carl **Orff** [or Carl Heinrich Maria **Orff**]

[10] This man was appalled by the singing voices of his country's children and created a style of musical pedagogy that employs solfege hand signs for visual aids during singing.

ANSWER: Zoltán **Kodály** (koh-"DIE") [or **Kodály** Zoltán]

13. This effect results from spin-spin coupling breaking the degeneracy of the "one s" ground state of hydrogen, increasing the energy of the triplet state and decreasing the energy of the singlet state. For 10 points each:

[10] Identify this effect that results in the spin-flip transition.

ANSWER: **hyperfine** structure [accept **hyperfine** splitting or **hyperfine** transitions; do not accept or prompt on answers mentioning "fine" without "hyper" such as "fine structure"]

[10] The hyperfine transitions of this element are used as the basis for atomic clocks and thus define the SI unit of the second.

ANSWER: **cesium** [or **Cs**; or **caesium**; accept **caesium**-133 or **cesium**-133]

[10] The hyperfine structure in hydrogen arises from the coupling of this quantity for electrons and protons. It is usually represented by mu.

ANSWER: **magnetic moment** [or magnetic **dipole moment**; prompt on "**moment**"]

14. This city's Podestà Alberto Morosini was captured at the Battle of Meloria, a decisive naval defeat at the hands of the Genoese that marked this city's decline. For 10 points each:

[10] Name this Tuscan city that ruled a maritime republic rivaling those of Venice and Genoa. This city's della Gherardesca (GAIR-ar-des-ka) family controlled much of Sardinia until the island was conquered by Aragon.

ANSWER: **Pisa**

[10] Pisa was the birthplace of this scientist, who tested his gravitational theories by dropping objects from its Leaning Tower. This man was put on trial for his book *Dialogue Concerning the Two Chief World Systems*.

ANSWER: **Galileo Galilei** [accept either underlined portion]

[10] In a history of the papacy titled *Absolute Monarchs*, this English historian wrote that Galileo's greatest mistake was caricaturing Urban VIII as Simplicius (sim-PLIH-kee-us). This man also wrote a popular three-volume history of Byzantium.

ANSWER: John Julius **Norwich** [accept John Julius **Cooper**, 2nd Viscount Norwich]

15. A man with this name owned a thrall named Bredi, whom Sigi killed and buried in a snowdrift because Bredi's hunting skills were greater than Sigi's skills. For 10 points each:

[10] Give this name that also belonged to the Norse goddess of skiing and winter; that goddess of this name, who selected her husband under the condition that she could see only the candidates' feet, ended up marrying Njord.

ANSWER: **Skadi** [or **Skade**; or **Skathi**]

[10] Sigi was the father of this man, whose difficulty in begetting a child led him to pray to the gods. Frigg sent a crow carrying an apple of fertility to this man's wife, and, six years later, his son Völsung was born.

ANSWER: **Rerir**

[10] When choosing her husband, Skadi had intended on marrying this Norse god of light, but it turned out that Njord had the most beautiful feet. This son of Odin and Frigg was accidentally killed by his blind brother, Hodr.

ANSWER: **Baldr** [or **Balder**; or **Baldur**]

16. Ancient Greek *kriophoros* (kree-oh-FOR-ohs) statues depicted Hermes carrying this kind of animal. For 10 points each:

[10] Name this type of animal that, in a Spanish artist's *Agnus Dei* (AHN-yoos DAY-ee), lies with its feet tied on a field of black and gray.

ANSWER: **rams** [accept **sheep** or **lambs** or **ovis** or **ovine**]

[10] The aforementioned *Agnus Dei* was completed by this Baroque Spanish painter of *The Martyrdom of Saint Serapion*. He often appears last on alphabetical lists of notable painters.

ANSWER: Francisco de **Zurbarán**

[10] This Spanish painter depicted a fancily dressed boy riding a ram in the aptly titled *Boy on a Ram*. This court painter to Charles IV decorated the walls of the Quinta del Sordo with the Black Paintings.

ANSWER: Francisco **Goya** [or Francisco José de **Goya** y Lucientes]

17. The protagonist of this novel, a man who suffered from amnesia and used a diary to attempt to regain his memory, was intended by its author to be as unlikable as possible. For 10 points each:

[10] Name this novel that includes many events set into motion by the machinations of Abbe Dalla Piccola, who alters the diary entries of the protagonist during his sleep.

ANSWER: *The **Prague Cemetery*** [or *Il **cimitero di Praga***]

[10] This Italian author of *The Name of the Rose* and *Foucault's Pendulum* wrote *The Prague Cemetery*.

ANSWER: Umberto **Eco**

[10] In *Foucault's Pendulum*, Belbo, Diotallevi, and Casaubon develop this fictional scheme of the Knights Templar, which leads other conspiracy theorists to believe the secret to a lost Templar treasure has been discovered.

ANSWER: The **Plan** [or Il **Piano**]

18. This leader's attempts to build a nuclear arsenal were frustrated when the Israeli Air Force bombed the Osirak (oh-"SIGH"-rak) nuclear reactor. For 10 points each:

[10] Name this dictator whose alleged further pursuit of nuclear weaponry was investigated by Hans Blix in 2002. Blix found nothing, but a U.S.-led coalition invaded his country in 2003 anyway.

ANSWER: Saddam **Hussein** [or Saddam **Hussein** Abd al-Majid al-Tikriti]

[10] During the First Gulf War, Hussein launched these ballistic missiles at Israel, intending to bring other Arab nations to his side. Hussein first used these missiles during the Iran-Iraq War's "War of the Cities" phase.

ANSWER: **scud** missiles [or R-17 **Elbrus**; R-11 **Elbrus**; or R-300 **Elbrus**]

[10] Iraq received overtures for nuclear assistance from this scientist and founder of Kahuta Research Laboratories. This scientist created an expansive network for black-market nuclear materials, selling gas-centrifuge technology to Iran, North Korea, and Libya until he was arrested in 2004.

ANSWER: A. Q. **Khan** [or Abdul Qadeer **Khan**]

19. The Lord's Prayer was the only prayer allowed among members of this sect, who were rumored to participate in mass nighttime orgies. For 10 points each:

[10] Name this dualist sect with Manichean origins. The name of this Bulgarian sect means "beloved to God."

ANSWER: **Bogomils** [accept word forms such as **Bogomilism**]

[10] Bogomilism falls under this broad term that describes religions whose adherents shunned the physical world in favor of a hidden spiritual world. This term comes from the Greek for "having knowledge."

ANSWER: **Gnosticism** [accept forms of the word **Gnostic**]

[10] According to the Bogomils, God had two sons, Satanail and a son with this name who became identified with Jesus after his baptism in the River Jordan.

ANSWER: **Michael**

20. In 2015, the FDA approved the first biosimilar drug under the Affordable Care Act, which was a recombinant form of this protein marketed by Sandoz under the name Zarxio. For 10 points each:

[10] Name this cytokine that is often administered to treat leukemia and is commonly sold by Amgen under the name Neupogen (NEW-poh-jen). It activates production of the namesake precursor cells to neutrophils.

ANSWER: **granulocyte colony-stimulating factor-3** [or **GCSF**; or **colony-stimulating factor-3**; or **CSF-3**; accept **filgrastim**]

[10] Specifically, GCSF stimulates differentiation of these stem cells, causing them to circulate in the bloodstream. These stem cells, derived from the mesoderm, are in the lineage of all blood cells.

ANSWER: **hematopoietic** (hee-MA-toh-poh-YEH-tic) stem cells [accept **HSCs**]

[10] Differentiation of hematopoietic stem cells into B cells occurs in this flexible yellow tissue, which is found in the interior of long bones and is transplanted to treat leukemia.

ANSWER: bone **marrow**

Extra. François Martin (fran-swah mar-tan), the founder of this city, surrendered it to the Dutch during the War of the Grand Alliance, though it was returned to the French at the cost of 16,000 pagodas by the Treaty of Ryswick. For 10 points each:

[10] Name this trading post that served as the capital of French India. Along with Karikal ("car"-ee-KAHL) and Yanaon (yah-nah-ohn), it was one of several French enclaves on the Coromandel (core-oh-MAN-dul) Coast.

ANSWER: **Pondicherry** [or **Pondichéry**]

[10] From his base at Pondicherry, this governor-general attempted to create a French empire in India. His ambitions were stifled by repeated defeats at the hands of his British rival, Robert Clive.

ANSWER: Joseph François **Dupleix** (doo-play) [or Marquis **Dupleix**]

[10] Clive won the Battle of Plassey during a campaign in which he captured this city from the Nawab of Bengal. The move responded to the mistreatment of British prisoners in this city's "Black Hole."

ANSWER: **Calcutta** [or **Kolkata**; accept Black Hole of **Calcutta**]