

## ACF Regionals 2019

Packet by NYU A, Rutgers A, Michigan A, and Oxford A

### Tossups

1. This artist imitated Henry Rowland's handwriting in creating a scientific-formula-filled frame for a portrait he painted of Rowland. Michael Fried ("freed") argued that this painter's work posed a link between "writing" and "disfiguration," noting similarities in this man's depiction of his father in *The Writing Master* and his portrayal of a different title figure using a "long, thin, pencillike instrument." This artist showed both himself and the clerk Franklin West writing in the background of a painting in which a seated woman shields her face from an action being carried out by four men. In that painting by this man, the title figure holds a bloody scalpel while lecturing about an ongoing leg operation at the Jefferson Medical College. For 10 points, name this American painter of *The Gross Clinic*.

ANSWER: Thomas Eakins ("AY-kins") [or Thomas Cowperthwait Eakins]

<Painting>

2. A poem titled for this place states "I hail the superhuman" and calls this place "death-in-life and life-in-death" and is set at night when some "drunken soldiery are abed." The speaker of another poem titled for this place promises "Once out of nature I shall never take my bodily form from any natural thing," imagining that instead he might "set upon a golden bough" and sing "of what is past, or passing, or to come." The speaker of that poem titled for this place laments how his heart is "fastened to a dying animal" and "knows not what it is." A poem titled for this place uses the image of "a tattered coat upon a stick" after saying that "an aged man is but a paltry thing." That poem titled for this place begins "That is no country for old men." For 10 points, W. B. Yeats ("yates") wrote a poem titled "Sailing to" what ancient city?

ANSWER: Byzantium [accept "Sailing to Byzantium"]

<British Literature>

3. This legislation's chief opponent compared it to "using an atomic bomb to kill a few mice." Sonia Johnson was excommunicated from the Church of Latter-Day Saints for speaking in support of this legislation. Wayne Townsend cast the tie-breaking vote in Indiana after being urged to vote in favor of this legislation by then-First Lady Rosalynn Carter. The "three-state strategy" is a current attempt to convert this piece of legislation into law. The conservative Eagle Forum was founded to oppose this legislation by Phyllis Schlafly. This legislation never actually became law because only 35 out of 38 states ratified it by the 1979 deadline. Alice Paul originally authored, for 10 points, what proposed constitutional amendment that would have ended distinctions between men and women in the United States?

ANSWER: Equal Rights Amendment [or ERA]

<American History>

4. These non-protein structures name an enzyme that acts on accessible areas of chromatin in Howard Chang's ATAC-seq ("attack-seek") method. Linking a reporter to one of these structures creates an enhancer trap. The IR/DR sequence of a type of these structures belongs to their Tc1/mariner class and binds to an enzyme that was synthetically resurrected from salmonids called Sleeping Beauty. These structures cause hybrid dysgenesis in the progeny of female lab flies and wild males, which have a type of these structures that is often used for insertional mutagenesis called the P element. They include the non-autonomous group SINEs, which are an example of their "retro" form. The first discovered examples of them were the Ac/Ds system discovered in maize. For 10 points, name these sequences characterized by Barbara McClintock that can "jump" around a genome.

ANSWER: transposons [or transposable elements; or jumping genes; or mobile genetic elements; or retroelements]

<Biology>

5. Marilyn Hacker wrote a poem about how this author's "guts clutched up like this." This author wrote that "a human being without old age is not a possibility" in a poem translated under the title "The Beat Goes On." In a poem by this author, the speaker says "it is as if my tongue has broken and immediately a subtle fire has run over my skin" while watching a man sitting opposite a woman and listening to her laughing. A. E. Housman wrote several adaptations of the so-called "midnight poem," which was long attributed to this author. Commands like "take the bitter care from my mind" and "in all my battles fight as my comrade" end a poem by this author addressed to a "deathless" and "iridescent-throned" goddess. "Ode to Aphrodite" is one of the few substantially complete poems by, for 10 points, what ancient Greek poet who lived on the island of Lesbos?

ANSWER: **Sappho**

<Other Literature>

6. This architect's extensive work in Malta includes the country's parliament building and a controversial redesign of the Valletta city gate. He included a multi-level system of terraces in his design for a museum at the southern entrance of the High Line park. Scenes by Canaletto depicting the spires of London inspired the steep pyramidal shape that this architect used in his design for the tallest building in the EU. This designer of the new Whitney Museum and the Shard collaborated with Noriaki Okabe on the longest airport terminal in the world, which sits on an artificial island in Osaka Bay. He also collaborated with Richard Rogers on a complex in Paris with a distinctive inside-out look. For 10 points, name this Italian architect of Kansai International Airport and the Pompidou Centre.

ANSWER: Renzo **Piano**

<Other Arts>

7. A reaction of this type uses lithium chloride and lead-4-acetate. Another reaction of this type begins by adding thiohydroxamate, then uses a radical initiator on tributyltin hydride. This reaction can occur spontaneously, with some catalytic amounts of acid, when a ketone is present beta to a certain functional group via a pericyclic mechanism. After forming a silver salt, bromine and CCl<sub>4</sub> ("C-C-L-4") can affect this transformation. This transformation, which occurs in reactions named for Kochi, Barton, and Hunsdiecker, is also the final step of malonic ester synthesis. It doesn't involve amine groups, but a PLP cofactor is used in enzymes that catalyze this reaction, like transforming L-DOPA to dopamine, glutamic acid to GABA ("GAB-uh"), and histidine to histamine. For 10 points, name this type of reaction in which CO<sub>2</sub> is removed.

ANSWER: **decarboxylation**

<Chemistry>

8. This ruler created a special position called the Ober-procurator intended to act as the "sovereign's eye" between him and the Senate. A revolt against this ruler was put down with the help of Scotsman Patrick Gordon, whose innovation of "moveable ramparts" helped this ruler seize Azov. This ruler mocked his country's church by founding a club that he called the All-Drunken Synod of Fools and Jesters. This tsar replaced the existing *mestnichestvo* ("m'YEST-nee-chist-vuh") system by creating a fourteen-rank hierarchy for military and civil services called the Table of Ranks. An equestrian statue of this tsar stands in Senate Square in a city that he intended as a "window to the west" after its site was captured from Sweden in the Great Northern War. For 10 points, name this Westernizing tsar who founded Russia's second-largest city after Moscow.

ANSWER: **Peter** the **Great** [or **Peter I**; prompt on **Peter**]

<European History>

9. A slow, bittersweet tenor aria opens with this instrument, over B-flat minor arpeggios, playing the steady notes F, down to five B-flats, followed by a fast A and C. That aria is sung by a character who, after spending all of his money to woo a woman, has finally seen his love requited. After a somber introduction in the clarinet and strings in

Tchaikovsky's Symphony No. 5, this instrument and the clarinet play the first main theme. This instrument introduces the melody of Donizetti's "Una furtiva lagrima." Accompanied by harp and muted strings, this instrument also introduces the main melody of the *Berceuse* from *The Firebird*. This instrument represents the grandfather in *Peter and the Wolf* and opens with a high solo in Stravinsky's *Rite of Spring*. For 10 points, name this low-pitched double-reed woodwind instrument.

ANSWER: **bassoon** [accept **fagotto**; do not accept "contrabassoon"]

<Music>

10. Evidence on a bowl from the reign of the pharaoh Aha contradicts Manetho's ("MAN-uh-thoh's") claim that the worship of this deity began during the second dynasty. Diodoros describes how this deity and his mother would spend forty days at Nilopolis before traveling to Memphis. During the reign of Ramses II, people started to bury this deity in the "Lesser Vaults" at its sanctuary in Saqqara. Herodotus describes how after killing this deity, Cambyses II was driven mad as a punishment. Members of the cult of this deity identified him using a series of markings including a triangle on the forehead. This son of Hathor was earlier considered a herald of Ptah before the Greeks combined him with another anthropomorphic deity. For 10 points, name this Egyptian deity in the form of a sacred bull, later syncretized with Osiris into an anthropomorphic god.

ANSWER: **Apis** [accept **Hapis** or **Hapi-ankh**, do not accept or prompt on "Serapis"]

<Mythology>

11. This phenomenon causes a relative decrease in neutron absorption cross-section with temperature, leading to a decrease in fission rate with temperature in some nuclear reactors. This phenomenon determines a limit equal to  $h$ -bar times natural linewidth over two  $k$ -sub- $B$ , due to fluctuations in absorption and emission of photons by a two-level atom. In gas samples, this phenomenon gives rise to a Gaussian linewidth with variance proportional to " $kT$  over  $mc$ -squared." A spectroscopic technique that uses a pump beam to saturate a sample allows frequencies to be measured "free" from the broadening caused by this phenomenon. This effect can be visualized as wavefronts bunching in front of a moving source while stretching out behind it. For 10 points, name this effect that produces a frequency shift proportional to  $\Delta v$  over  $c$  in moving reference frames.

ANSWER: **Doppler** shift [or **Doppler** effect; accept **Doppler** temperature, **Doppler** cooling limit, or thermal **Doppler** broadening]

<Physics>

12. This two-word phrase ends the title of a work that contrasts "truths of reason" with contingent "truths of fact" that require experience to learn. That work titled for this phrase describes a block of veined marble that marks out the shape of Hercules in order to argue that innate ideas take the form of "inclinations" and "natural potentialities." A different work whose title contains this two-word phrase claims that "mixed modes" depend on the combination of several ideas, as opposed to "substances." The character of Theophilus defends the ideas of Leibniz in a work by Leibniz titled for "new essays" on this phrase, which is itself a chapter-by-chapter refutation of a work whose title ends with this phrase. A distinction between primary and secondary qualities and a description of the mind at birth as a "tabula rasa" were advocated by John Locke in, for 10 points, *An Essay Concerning* what two-word phrase?

ANSWER: **human understanding** [accept *New Essays on* **Human Understanding** or *An Essay Concerning* **Human Understanding**; accept *Nouveaux essais sur* **l'entendement humain**]

<Philosophy>

13. It didn't happen in England, but this man once eliminated a rival warlord by sending an assassin to lay in wait in his enemy's latrine and stab him with a spear while he was relieving himself. This man destroyed the temple of Enryaku-ji ("EN-ryah-koo-JEE") during his siege of Mount Hiei ("HEE-ay"), reducing the power of the *sōhei* ("SO-hay"), or warrior monks, who opposed him. This man took revenge on the *ikkō-ikki* ("eek-KOH-eek-KEE") by destroying their stronghold at Nagashima. In one battle, this man set up gunmen behind wooden palisades in three

ranks to minimize reloading time. In a Japanese idiom, this man “pounds the national rice cake.” This man was forced to commit suicide after Akechi Mitsuhide (“ah-KEH-chee meet-soo-hee-day”) betrayed him in the Honnō-ji (“HONE-noh-JEE”) incident. This man defeated the Takeda clan using arquebusiers (“AR-kwuh-buh-SEERS”) at the Battle of Nagashino. For 10 points, name this first great unifier of Japan along with Toyotomi Hideyoshi and Tokugawa Ieyasu.

ANSWER: **Oda** Nobunaga [prompt on Nobunaga]

<World History>

14. A story by this author inspired the title of a novel in which Stuart Ressler studies the structure of the DNA molecule. The protagonist of a story by this author gets mad at his African-American servant for confusing his left eye with his right eye. The protagonist of that story by this author initially struggles to understand what is meant by the phrase “Bishop’s Hostel” until he realizes that it refers to a rock called Bessop’s Castle. This author helped popularize cryptography with a story about William Legrand’s search for treasure. The narrator of a story by this author reads *The Mad Trist* to a man who dies of fright when his twin sister Madeline, who he thought was dead, appears in the doorway. For 10 points, name this author of “The Gold-Bug” and “The Fall of the House of Usher.”

ANSWER: Edgar Allan **Poe** (The novel in the first sentence is *The Gold Bug Variations* by Richard Powers.)

<American Literature>

15. In one country, a holiday dedicated to these people features the creation and gifting of literal “money trees.” These are the only people who are eligible to earn an academic degree called the geshe (“gay-shay”). A scripture read by these people was recited from memory by Upali. A puja dedicated to people of this type is celebrated with charitable donations and follows Vassa, a three-month period during which they are prohibited from traveling. A group of these people founded by Ajahn Mun primarily practices in the forests of Thailand. The first “basket” of the Tripitaka is entirely dedicated to rules for these people. The official title for a person of this type is a *bhikkhu*. For 10 points, name this occupation whose holders may wear orange robes if they are a member of the Theravada school.

ANSWER: **Buddhist monks** [accept **bhikkhuni** until read; prompt on Buddhists or monks]

<Religion>

16. Karel Čapek’s (“CHAH-peck’s”) novel *Hordubal* is about a man who returns home after working in this country for eight years. A novel set in this country was translated by Mark Harman with the subtitle “The Missing Person,” referencing the author’s working title. The first paragraph of that novel set in this country oddly describes sunlight illuminating an arm holding a sword aloft. In this country, the protagonist is imprisoned in Brunelda’s apartment by a pair of drifters who constantly exploit him named Delamarche and Robinson. A novel set in this country ends with the protagonist getting a job at a “Nature Theater” after being fired from the Hotel Occidental. In a novel that started out as a short story called “The Stoker,” Karl Rossmann emigrates to this country. For 10 points, name this country that titles an unfinished novel by Franz Kafka.

ANSWER: United States of **America** [or **United States** of America; or **USA**]

<European Literature>

17. In a book titled for these people’s culture, the anthropologist Sabina Magliocco (“mall-YO-ko”) used a term from Michel de Certeau (“sair-TOH”) to describe them as “textual poachers” of the work of Charles Leland (“LEE-land”) and Margaret Murray. Peter Geschiere (“guh-SHEER-uh”) notes that among the modern Maka people, the elite *Grands* (“grahnd”) are thought to derive power from a group of these people engaged in *djambe* (“JOM-bay”). A book by Silvia Federici argues that campaigns against these people were central to the creation of the proletariat during the transition to capitalism. These people are defined by their inheritance of *mangu* in their stomach, and their actions are sometimes detected by people who poison a chicken with *benge* (“BEN-gay”), according to a book by E. E. Evans-Pritchard that examines oracles and these people in Azande culture. The *Malleus*

*Maleficarum* is a manual for resisting the influence of, for 10 points, what people, typically women, who were often burned at the stake in 17th-century Europe?

ANSWER: **witches** [accept *Witching Culture* or *The Modernity of Witchcraft* or *Caliban and the Witch*; accept **witch** doctors or **Wiccans**; prompt on healers, magicians, shamans, neo-Pagans, sorcerers, or women]  
<Social Science>

18. Gangs from this city called the Golden Kane and the Imperial 9s appear in *Stranglehold*, a video game sequel to a movie set in this city. A film character who repeatedly buys tins of pineapple with a specific expiration date seeks out a woman in a blonde wig in this city's Bottoms Up Club, which is where Nick Nack steals the slain Gibson's "Solex agitator" in *The Man With The Golden Gun*. Brigitte Lin's character runs a drug-smuggling operation out of the Chungking Mansions in this city, which is also home to the heavy-drinking cop Tequila Yuen in the film *Hard Boiled*. This city contains a park on the former site of a densely-populated district called Kowloon Walled City. Many films directed by Wong Kar-Wai and John Woo are set in, for 10 points, what special administrative region of China?

ANSWER: **Hong Kong** [anti-prompt on Kowloon by asking "Can you be less specific?" before "Kowloon"]  
<Trash>

19. The most famous work of Ben Zion Netanyahu ("ben-tsee-YONE neh-tahn-YAH-hoo") traces the origins of an institution that came about in this century. The inconclusive Battle of Toro in this century was propagandistically spun as revenge for the earlier Battle of Aljubarrota ("all-zhoo-buh-RO-tuh"). Two kingdoms were united in this century with a prenuptial agreement that had the motto *Tanto monta, monta tanto*, or "they amount to the same, the same they amount to." Charles VIII's invasion of Italy in this century led to the formation of the League of Venice opposing France. The Nasrid Dynasty ended in this century with the abdication of its last ruler, Boabdil. The Alhambra Decree that expelled all Jews from the kingdoms of Aragon and Castile was issued in this century. For 10 points, name this century in which Ferdinand and Isabella ended the Reconquista ("ray-con-KEE-stah") in Spain.

ANSWER: **1400s** [or the **15th** century; accept *Origins of the Inquisition in Fifteenth Century Spain*]  
<European History>

20. This computer scientist described a backtracking scheme to solve a matrix version of the exact cover problem, where the links of a list of nodes "dance" with different partner nodes. This man proposed a number system with base  $2i$  and introduced a paradigm that put source code within descriptive text, called "literate programming," that he implemented with WEB. He developed the first linear-time search-string algorithm with Morris and Pratt. This computer scientist developed the system for rendering raster fonts, called Metafont, which he used for the Computer Modern font he designed. For 10 points, name this American computer scientist who developed the typesetting language TeX ("tek") and continues to write *The Art of Computer Programming*.

ANSWER: Donald **Knuth** ("k'NOOTH") [or Donald Ervin **Knuth**]  
<Other Science (Computer Science)>

21. The end of this book describes how "a full moon shone like a slice of raw onion" after a character puts a wedge of dolphin in a rusty tin. A character in this book becomes obsessed with one of his ancestors, a midshipman who died at the Battle of the Saintes ("sant"). This book opens with a character explaining to a group of tourists "This is how, one sunrise, we cut down them canoes." In this book, a swift that flies across the Atlantic Ocean carries a seed that can heal the wound of the fisherman Philoctete ("fee-lohk-TET"). Characters in this poem include the blind Seven Seas, who frequents Ma Kilman's shop, and the Englishman Major Plunkett and his wife Maud. For 10 points, name this epic poem that transports the characters of the *Iliad* to St. Lucia ("LOO-sha"), written by Derek Walcott.

ANSWER: **Omeros**  
<World Literature>



## Bonuses

1. A detective with this profession discovers Jobter's attempts to swindle the Crofton family out of an inheritance in R. Austin Freeman's "The Mysterious Visitor." For 10 points each:

[10] Give this profession of John Thorndyke. This is also the profession of Sherlock Holmes's assistant, Watson.

ANSWER: **doctor** [or **physician**]

[10] Like Freeman, this author worked during the Golden Age of Detective Fiction. She wrote about the sleuth Albert Campion in novels like *The Tiger in the Smoke* and *Sweet Danger*.

ANSWER: Margery **Allingham** [or Margery Louise **Allingham**]

[10] Albert Campion was originally a parody of Lord Peter Wimsey, a detective created by this author of *The Nine Tailors*. Her personal favorite of her own works was her translation of the *Divine Comedy*.

ANSWER: Dorothy **Sayers** [or Dorothy Leigh **Sayers**]

<British Literature>

2. Caer Ibormeith appears as one of these animals with a gold necklace alongside "three fifties" of these animals with silver necklaces when she first meets Aengus. For 10 points each:

[10] Name these animals. The children of Lir are turned into these animals by their mother Aoife ("EE-fuh") and consigned to that fate until St. Patrick can liberate them.

ANSWER: **swans**

[10] Aengus was a member of the Tuatha Dé Danann ("too-uh-huh day DAWN-in"), a group who evolved into the Aos Si ("ace shee"), a group of these creatures. In England, a brownie is one of these creatures who helps with household chores at night.

ANSWER: **fairies** [or **fairy**; accept **Daoine Sídh**]

[10] This type of fairy is a shoemaker known to hide pots of gold at the ends of rainbows. Their typical green garb has only been around since the 20th century.

ANSWER: **leprechauns**

<Mythology>

3. This man declared that "Under the weight of recent history, I did what people do when words fail them" after performing a spontaneous action. For 10 points each:

[10] Name this leader who fell to his knees in front of the Warsaw Ghetto Memorial in 1970. This leader of his country's Social Democratic Party won the 1971 Nobel Peace Prize.

ANSWER: Willy **Brandt** ("VILL-ee BRAHNT") [or Herbert Ernst Karl **Frahm**]

[10] Willy Brandt was a chancellor of this country, which was governed from the city of Bonn. Its "economic miracle" was engineered by Ludwig Erhard.

ANSWER: **West Germany** [accept **Federal Republic of Germany** or **FRG**; accept **Bundesrepublik Deutschland** or **BRD**; do not accept or prompt on "Germany"]

[10] Brandt's tenure as chancellor was cut short when this personal assistant of his was revealed to be an East German Stasi ("STAH-zee") agent. Brandt had previously taken this man on a private vacation to Norway with him.

ANSWER: Günter **Guillaume** ("gee-YOHN")

<European History>

4. In the dedication of a piano suite, this composer wrote, "To my dear little Chouchou ("shoo-shoo"), with tender apologies from her father for what follows." For 10 points each:

[10] Name this French composer of *Children's Corner* who wrote another piano suite called *Suite Bergamasque*, whose third movement is "Clair de lune."

ANSWER: Claude **Debussy** [or Achille-Claude **Debussy**]

[10] The first movement of *Children's Corner* parodies this Italian-born composer's set of keyboard studies *Gradus ad Parnassum*. This piano pedagogue competed against Mozart in a piano duel in 1781.

ANSWER: Muzio **Clementi**

[10] The middle section of "Golliwog's Cakewalk," the ragtime-inspired final movement of *Children's Corner*, parodies a motif from this opera. Each quotation, marked *avec une grande émotion* ("ah-VEK oon GROND ay-mose-YAWN"), is interspersed with banjo imitations.

ANSWER: ***Tristan und Isolde*** [or ***Tristan and Isolde***] (The quoted motif is the *Liebestod*.)

<Music>

5. These functions can be defined by a generalization of the generating function for Legendre ("luh-ZHOND-ruh") polynomials. For 10 points each:

[10] Name these polynomials, often symbolized  $T_{\text{sub-}n}$ , that are solutions to an ultraspherical ODE ("O-D-E"). They oscillate between negative one and one, and they minimize the maximum error in a truncated series expansion.

ANSWER: **Chebyshev** polynomials [accept **Chebyshev** series or **Chebyshev** expansion]

[10] Chebyshev polynomials can be used to define one of these systems with steep roll-off at the cost of increased ripple. These systems have negative gain for the frequencies that they reject.

ANSWER: **filters** [accept bandpass **filters**; accept Chebyshev **filters**]

[10] The Chebyshev polynomials have this useful property, meaning that the integral inner product between two polynomials with indices  $n$  and  $m$  is proportional to a delta function of  $n$  and  $m$ . It is named in analogy to vectors at right angles to each other.

ANSWER: **orthogonality** [accept word forms like **orthogonal** polynomials]

<Other Science (Mixed)>

6. Abdullah Öcalan ("OH-juh-lahn") developed the Kurdistan Workers' Party's theory of "democratic confederalism" after studying the works of this philosopher in prison. For 10 points each:

[10] Name this American thinker who pointed to the "dissolution of hierarchy" as the method for achieving a system of "social ecology" in his book *The Ecology of Freedom*.

ANSWER: Murray **Bookchin**

[10] *The Ecology of Freedom*'s final chapter praises this French utopian socialist thinker as "a rationalist who detested the rationalization of life," highlighting this man's plan to achieve social harmony by sorting people into "phalanxes."

ANSWER: Charles **Fourier** [or François Marie Charles **Fourier**; do not accept "Joseph Fourier"]

[10] In another work, Bookchin analyzed how this political system, which generally seeks to abolish state institutions, would function in a "Post-Scarcity" world. This political system names a Robert Nozick book alongside "State" and "Utopia."

ANSWER: **anarchism** [or **anarchy**; accept *Post-Scarcity* **Anarchism** or **Anarchy, State, and Utopia**]

<Social Science>

7. This man ran out of his cabin shouting "Noble earthquake!" during the 1872 Lone Pine earthquake. For 10 points each:

[10] Name this naturalist and founder of the Sierra Club. He was instrumental in establishing Yosemite National Park.

ANSWER: John **Muir** ("myurr")

[10] Muir was a friend of this conservationist president who championed the "Square Deal" and ran as the Progressive Party candidate in 1912.

ANSWER: **Theodore Roosevelt** [or **TR**; prompt on **Roosevelt**]

[10] Muir strongly condemned the flooding of this California valley, comparing it to destroying churches and cathedrals. Nevertheless, it was approved in 1913 by the Raker Act.



ANSWER: **Hetch Hetchy** Valley  
<American History>

8. Teachings of this movement were collected in its namesake “Codification” by a man who used the pseudonym Allan Kardec (“ah-LAHN kar-DECK”). For 10 points each:

[10] Name this movement whose beliefs are syncretized with Catholicism to form the religion of Santo Daime (“SAHN-too DYE-mee”). It was inspired in part by the visions of Emanuel Swedenborg.

ANSWER: **Spiritism** [prompt on spiritualism]

[10] Kardec wrote a handbook for these people who purport to help people communicate with spirits through séances (“SAY-on-sizz”).

ANSWER: **mediums** [prompt on spiritualists or spiritists]

[10] Another inspiration for Allan Kardec was this German doctor’s idea of “animal magnetism.” He claimed to be able to cure people through his own touch.

ANSWER: Franz **Mesmer** [or Franz Friedrich Anton **Mesmer**]

<Religion>

9. The secondary form of this effect happens when the substituted atom is not directly involved in a bond that’s formed or broken. For 10 points each:

[10] Name this effect in which exchanging an atom for one with a different mass number causes a change in reaction rate. It is often used to determine unknown reaction mechanisms.

ANSWER: **kinetic isotope** effect [or **KIE**; prompt on isotope effect]

[10] Replacing an atom of this element with deuterium produces a strong kinetic isotope effect, because this simple element’s most abundant isotope is roughly half as massive as deuterium.

ANSWER: **hydrogen** [or **H**]

[10] The kinetic isotope effect of this reaction mechanism is very close to 1. The Finkelstein reaction follows this mechanism.

ANSWER: **SN2** [or **bimolecular nucleophilic substitution**]

<Chemistry>

10. The most recent winner of this prize opens with Somebody McSomebody threatening to shoot the protagonist before calling her a cat. For 10 points each:

[10] Name this literary prize whose first Northern Irish laureate, Anna Burns, won it in 2018 for her novel *Milkman*. In 2014, this prize’s eligibility was widened to include all English-language novels.

ANSWER: Man **Booker** Prize for Fiction

[10] “Milkman” is also the nickname of Macon Dead, the protagonist of this Toni Morrison novel.

ANSWER: **Song of Solomon**

[10] Richard Hannay disguises himself as a milkman to escape his potential assassins in *The Thirty-Nine Steps*, a novel by this Scot who also served as Governor General of Canada.

ANSWER: John **Buchan** (“BUKH-in”), 1st Baron Tweedsmuir [prompt on 1st Baron **Tweedsmuir**]

<Other Literature>

11. After resigning as mayor of this city in 2018, Patricia de Lille left the Democratic Alliance and formed a political party simply named “Good.” For 10 points each:

[10] Name this city. De Lille was criticized for her handling of the ongoing water crisis in this city, which in 2018 narrowly avoided completely shutting off municipal water supplies in a situation dubbed “Day Zero.”

ANSWER: **Cape Town**, South Africa [or City of **Cape Town**; or Stad **Kaapstad**; or IsiXeko **saseKapa**]

[10] This former president of South Africa, who was succeeded by Cyril Ramaphosa in 2018, was also accused of mishandling the Cape Town water crisis.

ANSWER: Jacob **Zuma** [or Jacob Gedleyihlekisa **Zuma**; prompt on **JZ** or **Msholoz**]

[10] Zuma often blamed calls for his resignation on this three-word phrase common in contemporary South African political discourse. The PR firm Bell Pottinger ran a campaign portraying the Gupta family as victims of a conspiracy involving this concept.

ANSWER: **white monopoly capital** [prompt on partial answers]

<Current Events>

12. Ranks of pine trees divide the square canvas in two in a painting of this city titled *White Night*. For 10 points each:

[10] Name this city depicted in a painting of Karl Johan Street by the same artist, in which some hat-wearing figures on the left advance towards the viewer.

ANSWER: **Oslo** [or **Christiana**]

[10] *Evening on Karl Johan Street* was included as part of the “Angst” section of this series of artworks by Edvard Munch (“moonk”), which was first displayed at the Berlin Secession in 1902.

ANSWER: *The **Frieze of Life***

[10] An experience on the road between Oslo and Nordstrand in which the “sky became bloody red” and Munch “leaned against a railing” inspired him to paint this best-known work of his.

ANSWER: *The **Scream*** [or **Skrik**]

<Painting>

13. This man won the Battle of Plymouth against England while serving under Maarten Tromp. For 10 points each:

[10] Name this admiral who burned thirteen English ships in an attack near Chatham that took place shortly after Holmes’s Bonfire.

ANSWER: Michiel de **Ruyter** (“mih-KHEEL duh RAO-ter”) [or Michiel Adriaanszoon de **Ruyter**]

[10] Michiel de Ruyter was an admiral for this country, which won independence from Spain in the Eighty Years’ War.

ANSWER: **Netherlands** [or Kingdom of the **Netherlands**; accept **Dutch** Republic; accept **Holland**]

[10] The aforementioned Raid on the Medway, which is described in Samuel Pepys’s (“PEEPS’s”) diary, occurred in this decade.

ANSWER: **1660s**

<European History>

14. This kind of animal appears in the title of a story that ambiguously ends with a woman saying to either her husband or another man, “You could have just driven away... forsook me. Forsooken me. Forsaken.” For 10 points each:

[10] Name this type of animal that appears in the title of that Alice Munro story about Grant and his wife Fiona, who suffers from Alzheimer’s. In another story, Isaac hunts one of these animals called Old Ben.

ANSWER: **bear** [accept “The **Bear**” or “The **Bear** Came Over the Mountain”]

[10] Isaac hunts Old Ben in this author’s story “The Bear,” which he set in Yoknapatawpha (“yock-nuh-puh-TAW-fuh”) County, like most of his novels, including *The Sound and the Fury*.

ANSWER: William **Faulkner**

[10] The title character of a Thomas Bangs Thorpe story styles himself as “the big bear” of this US state. This home state of Charles Portis is where Maya Angelou grew up, as recounted in *I Know Why the Caged Bird Sings*.

ANSWER: **Arkansas**

<American Literature>

15. An organism from this phylum was the first multicellular organism to have its entire genome sequenced. For 10 points each:

[10] Name this phylum that includes *C. elegans*, pinworms, and hookworms.

ANSWER: **nematoda** [accept **nematodes**]

[10] *C. elegans* was used to discover RNAi, whose process includes this enzyme that initiates microRNA processing in the nucleus. It binds to Pasha to form the microprocessor complex.

ANSWER: **Drosha**

[10] Drosha and Dicer are downregulated in some types of this cancer. This cancer has an ER-positive form that can be treated using tamoxifen, and it may also have extra copies of HER2/neu.

ANSWER: **breast** cancer

<Biology>

16. Name some medieval philosophers who wrote about the *locutio angelica*, or the language that angels use to communicate, for 10 points each.

[10] This thinker influentially argued that angels convey previously interior thoughts through a “spiritual nod.” This scholastic from Hales came to prominence after writing *A Gloss on the Four Books of the Sentences of Peter Lombard*.

ANSWER: **Alexander** of Hales [or **Doctor Irrefragibilis**; prompt on **Halensis** or **Halesius**]

[10] Alexander’s account of angelic speech was repurposed by this later thinker, who also argued that inferior angels can, in fact, speak to superior angels in a section of his *Summa Theologica*.

ANSWER: Saint Thomas **Aquinas** [or Tommaso d’**Aquino**]

[10] This philosopher argued that Aquinas’s claim that angels already know everything about the universe would mean that they would have nothing to talk about with each other, choosing instead to frame angels’ individual and incomplete knowledge as a sign of their “haecceity” (“heck-SEE-uh-tee”).

ANSWER: **Duns** Scotus [or John **Duns**]

<Philosophy>

17. In Act 2 of a ballet, the title character gives two of these objects to her step-sisters while they all attend the Spring Ball. For 10 points each:

[10] Name these objects. In an opera titled for these objects, a jester uses a magic ribbon to distract a giantess, sung by a bass, who guards these objects.

ANSWER: **oranges** [or three **oranges**; prompt on less specific answers like **fruit**]

[10] This Soviet composer wrote the ballet *Cinderella* and the opera *The Love for Three Oranges*.

ANSWER: Sergei **Prokofiev** [or Sergei Sergeyevich **Prokofiev**]

[10] In *A Love for Three Oranges*, Fata Morgana beats Tchelio three times in a row in this activity. In a Tchaikovsky opera, Herman sings “What is our life? A game!” just before losing at this activity, after which he commits suicide.

ANSWER: playing **cards** [accept more specific answers like playing **poker**] (The opera is *The Queen of Spades*.)

<Other Arts>

18. Answer the following about the French literary movement Oulipo (“oo-lee-poh”), for 10 points each.

[10] The Oulipo novel *A Void* was written without using this vowel, which is the most frequently used letter in both French and English.

ANSWER: **e**

[10] *A Void* is by this French author who also wrote *Life: A User’s Manual*.

ANSWER: Georges **Perec**

[10] Jean Lescure (“less-KOOR”) invented an Oulipo technique in which every noun in a text is replaced with the *n*th noun following it in a dictionary, where *n* is this number.

ANSWER: **seven**

<European Literature>

19. This system's Hamiltonian includes quadratic kinetic and potential energy terms. For 10 points each:

[10] Name this physical system that classically consists of an object experiencing a restoring spring force. The quantum version of this system has energy levels with even spacing of  $\hbar\omega$ .

ANSWER: **harmonic oscillator** [accept **HO** or quantum **harmonic oscillator** or **QHO** or simple **harmonic oscillator** or **SHO**]

[10] The quantum harmonic oscillator can be solved by rewriting the Hamiltonian in terms of these operators, which are typically symbolized  $a$  and  $a$ -dagger.

ANSWER: **ladder** operators [accept **raising** and **lowering** operators, or **creation** and **annihilation** operators (in either order)]

[10] These states are eigenvectors of the lowering operator,  $a$ . They are often considered to be the most classical quantum states because the expectation values of position and momentum oscillate as they do for a classical oscillator.

ANSWER: **coherent** states

<Physics>

20. Name some things about the travels of Afonso de Albuquerque, for 10 points each.

[10] Albuquerque often fought forces of this empire around the Red Sea and the Indian Ocean. This empire's ruler Selim the Grim conquered Mamluk Egypt in 1517.

ANSWER: **Ottoman** Empire [or Exalted **Ottoman** State; or Devlet-i Aliye-i **Osmaniye**; or **Osmanlı** Devleti; or **Osmanlı** İmparatorluğu; accept **Turkish** Empire; prompt on **Turkey**]

[10] Albuquerque was named duke of this Portuguese enclave in India after conquering it in 1510. It would remain Portuguese territory until 1961, when India retook it in Operation Vijay.

ANSWER: **Goa**

[10] In 1515, Albuquerque sent one of these animals to Manuel I of Portugal from Goa. It was pitted in a fight against an elephant and drowned en route to Rome where it was intended as a gift to Leo X.

ANSWER: **rhinoceros**

<World History>

21. Answer the following about germ layers, for 10 points each.

[10] Germ layers are the layers of cells that form during this stage of organismal development between the zygote and the fetus.

ANSWER: **embryo** [or **embryonic** development]

[10] Diploblastic animals like Cnidaria ("nye-DARE-ee-uh") have these two germ layers, while triploblastic animals like humans have a third layer, the mesoderm, as well.

ANSWER: **endoderm** AND **ectoderm**

[10] In most mammals, the inner cell mass gives rise to two layers; this layer differentiates into the three germ layers, while its partner gives rise to extra-embryonic tissue.

ANSWER: **epiblast**

<Biology>