

2022 ACF Regionals

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Packet A by Claremont Colleges, Stanford A, Tennessee, UNF A

TOSSUPS

1. An author from this people wrote a poem often translated as “Song of the Flight” that is included in a collection of “ballads of the lords.” Another author imagines someone who “lived in our basement and sacrificed my parents” as a member of this people in a 2012 poetry collection about her meth-addicted brother; that collection is titled *When My Brother Was* [one of these people]. These people inspired the title of a poem that repeats “a tree that is firmly rooted and that dances” and ends with “a river that goes curving, advances and retreats . . . arriving forever.” A poet from this empire wrote “flower songs” and had a name meaning “hungry coyote.” This empire’s calendar inspired the 584-line structure of the poem “Sunstone” by Octavio Paz. For 10 points, what empire’s ruler Nezahualcoyotl (“nay-sah-wahl-KOH-yoh-tull”) wrote poems in Nahuatl (“NAH-wah-tul”)?

ANSWER: **Aztec** civilization [accept **Mexicas**; accept **Nahuas** before “Nahuatl”; accept *When My Brother Was an Aztec*; prompt on **Mexicans** or **Mexico**; prompt on **Indigenous** peoples]

<World Literature>

2. In *The Body of Myth*, J. Nigro Sansonese argued one of these objects was analogized to the heart in a trance-like ritual in which the *kiste* box was analogized to the skull. Side (“SEE-day”), a wife of Orion, was named for these objects in a pairing that mythographers connect to an annual time when the Orion constellation was high. Terracotta pine cones, poppy seeds, and these objects were offered to Hera at Samos. For revealing an incident with one of these objects, Ascalaphus was turned into a lizard. Ancient Egyptians drank barley beer mixed with juice of this fruit to celebrate the subdual of Sekhmet. This fruit was “slipped into the hand” of a goddess worshipped as Kore (“KO-ray”) at the Eleusinian Mysteries. For 10 points, name this “fruit of the dead,” whose consumption bound Persephone to the underworld.

ANSWER: **pomegranates** [or ***Punica granatum*** or ***P. granatum***; prompt on **fruit** before mention]

<Mythology>

3. This non-French ruler was opposed by the Citizen’s Committee of Public Safety. This ruler resided in Washington Place, which was established by the family of John Owen Dominis. This ruler faced a vote of no confidence after signing bills that created licensing for the sale of opium and a lottery system in response to an 1890 tariff. After visiting Queen Victoria during a world tour, this ruler wrote the song “The Queen’s Jubilee.” A rebellion in support of restoring this ruler to power was led by Robert Wilcox. The Blount Report ruled that the overthrow of this ruler was illegal after she was targeted for opposing her predecessor’s signing of the Bayonet Constitution. For 10 points, name this queen who was overthrown by American-backed forces in 1893, the final queen of Hawai’i.

ANSWER: Queen **Lili’uokalani** [or Lili’u Loloku Waliana **Kamaka’eha**; or Lydia **Kamaka’eha**] (The 1890 tariff was the McKinley Tariff.)

<American History>

4. *Two answers required.* In a 2008 *Nature* paper, Strukov, Snider, Stewart, and Williams reported a device that exhibits double loops on a plot of these two quantities by sandwiching a thin semiconductor film with doped and undoped regions between two metal contacts. The ratio of the output value of one of these quantities to the input value of the other gives a quantity denoted “lowercase g-sub-m.” The x-intercept on a plot of these two quantities gives the strength of the Early effect. On plots of these two quantities, memristors display hysteresis (“HIST-er-EE-siss”). These two quantities are plotted on transistors’ characteristic curves. The product of these two quantities is the power radiated by a resistor. For 10 points, name these two quantities whose ratio is resistance by Ohm’s law.

ANSWER: **current** [or **I**] AND **voltage** [or **V**] (The lead-in refers to the paper “The missing memristor found.” Lowercase g-sub-m is transconductance.)

<Physics>

5. The owner of an artwork made with this substance split it into two pieces by setting it on fire; one of those pieces is now located at the Palace Museum. In 1999, James Cahill controversially claimed that an artwork in the Met made with this substance was a forgery created by a much-later artist. An artist who primarily worked with this substance was known as “Madman” for paintings of a poet strolling and the *Drunken Celestial*. A master of painting with this substance created an artwork depicting six persimmons. Josetsu was known as the father of Japanese paintings made with this substance, which was used for paintings of mountains and rivers by the shān shuǐ (“shahn shway”) school. Chinese scrolls were often painted with, for 10 points, what substance also used to make calligraphy?

ANSWER: **ink** [or **ink** wash painting or **shuǐmòhuà**; prompt on **paper**; prompt on **handscrolls** by asking “what substance was used to paint the scrolls?”] (The painting in the first sentence is *Dwelling in the Fuchun Mountains* by Huáng Gōngwàng. Cahill argued that Zhāng Dàqiān forged *The Riverbank*, which is attributed to Dǒng Yuán. Liáng Kǎi was known as “Madman Liáng.” *Six Persimmons* is by Mùxī.)

<Painting/Sculpture>

6. When asked how old he is, a man in this novel forgets his age and rambles on about twenty-eight kinds of fish sauce. A man in this novel describes a group’s “barbaric lavishness with time” to a man he calls “Engineer,” who considers “time spacious before him” while wrapped in camel-hair blankets. A woman in this novel slams a door at the same time each day en route to the “good Russian” table; her “Kirghiz (“KEER-giz”) eyes” remind a man of his childhood crush. In this novel, a man is told that “we up here” do not use such a small “unit of time as the week” by Settembrini. This novel’s protagonist goes to visit his cousin Joachim (“YO-ah-keem”) for three weeks, but falls in love with Claudia Chauchat (“KLAV-dee-ah show-sha”) and stays for seven years. For 10 points, name this Thomas Mann novel about Hans Castorp’s stay in a sanatorium.

ANSWER: *The **Magic Mountain*** [or *Der **Zauberberg***]

<European Literature>

7. Michael E. Porter argued that this concept is outmoded by citing Korea's "miracle on the Han River" and proposed replacing it with a diamond of four national determinants. The parameter theta that governs this concept is countered by geographic barriers in a paper by Eaton and Kortum that builds on Dornbusch, Fischer, and Samuelson's continuum model. Robert Torrens proposed an early form of this concept in an 1815 essay on Polish corn. Different relative proportions of factor endowments lead to this concept in the Heckscher–Ohlin model. This concept was numerically formulated using Portuguese wine and English cloth by David Ricardo. For 10 points, what concept holds that production efficiency is maximized by trading goods with the lowest opportunity cost, even without an absolute advantage?

ANSWER: **comparative advantage** [accept factor **comparative advantage**; accept *The **Competitive Advantage of Nations***; prompt on **opportunity cost** before read by asking "what consequence of different opportunity costs in international trade?"; prompt on **advantage** before read; prompt on free **trade** or international **trade** before "trading"; prompt on **specialization** or equivalents]

<Social Science>

8. A possible rerun of this event is linked to climate change in Africa and the "second" globalization in the book *Black Earth*. The term "commemorative causality" warns how the eventual study of this event will reflect only "contemporary emotions," according to Timothy Snyder. A Daniel Goldhagen book revived debate over interpretations of this event presented by Andreas Hillgruber and Ernst Nolte during the "historians' quarrel." Christopher Browning places blame for this event on those in positions of power while excusing the title *Ordinary Men*. The trial of the "architect" of this event is discussed in a book subtitled for the "banality of evil" and written by Hannah Arendt ("AIR-unt"). For 10 points, name this event discussed in *Hitler's Willing Executioners*, the goal of the "Final Solution."

ANSWER: the **Holocaust** [or Ha**Shoah**; prompt on the **Final Solution** or **World War II** or **WWII** before "Final Solution"; prompt on **genocide**] (Timothy Snyder wrote *Black Earth*. The Hannah Arendt book is *Eichmann in Jerusalem*.)

<European History>

9. An algorithm for analyzing this type of data uses bidirectional Transformer encoders with 15% of the input masked, similar to a Cloze task. A bidirectional LSTM architecture is used to analyze this type of data in the ELMO ("elmo") algorithm, which preceded an algorithm for this type of data called BERT ("bert"). A representation of this type of data is constructed by performing singular value decomposition on a matrix of tf-idf values. This type of data can be embedded into a space of feature vectors using a skip-gram model. Assessing the polarity of this type of data is a rudimentary task in sentiment analysis. This type of data is generated by the GPT-3 model, which was trained on a massive corpus. For 10 points, NLP models operate on speech and what other type of language data?

ANSWER: **text** [accept **documents**; accept text **corpus** or text **corpora** before "corpus"; accept **tokens**; accept **words**; accept **word2vec** ("word-2-vec"); accept **strings**; prompt on **language** by asking "the language data is in what form?"; prompt on **writing**; reject "handwriting"] (The third sentence refers to latent semantic analysis.)

<Other Science>

10. This artist sings, "I'm high and I'm feeling anxious in the CVS," as the (emphasize) *guest* artist on a track where she also repeats the chorus "Life's so fun, got my miniskirt and my Rollerblades on." This guest artist on MUNA's track "Silk Chiffon" intones, "I'm strapped into a corset, climbed into your corvette," on a duet with Conor Oberst inspired by the death of Dylan Thomas. This artist asks, "Why do you sing with an English accent?" on a song inspired by her breakup with Ryan Adams. This female half of the duo Better Oblivion Community Center smashed her guitar during a 2021 performance on *SNL*. This artist appears in a skeleton costume on the cover of a 2020 album that features the songs "Graceland Too" and "Kyoto." For 10 points, name this artist of the album *Punisher*.

ANSWER: Phoebe **Bridgers** [or Phoebe Lucille **Bridgers**] (The third clue refers to "Motion Sickness.")

<Pop Culture>

11. Fmoc-FF (“F-mock-FF”) transitions from flat ribbons to this type of material as pH rises above 6.4. The Stöber (“SHTUR-bur”) process uses this type of material to produce uniformly sized silicon dioxide particles. These materials form when crosslinking results in molecular mass diverging, according to Flory–Stockmayer theory. Thin films can be produced by depositing a colloid and allowing monomers to coalesce into this type of material as the coating dries, in the “sol–[this material]” process. A subtype of these materials termed “frozen smoke” has extremely low density; that “aero” form of these materials has gas as the dispersed fluid phase. A network of polymers or other solids provides structure to, for 10 points, what semisolids exemplified by the agarose matrix used in electrophoresis (“electro-for-EE-siss”)?

ANSWER: **gels** [accept **gel** point; accept sol–**gel** process; accept **aerogels**; accept **gel** electrophoresis; prompt on **polymers**; prompt on **colloids**; prompt on **semisolids**; prompt on **quasi-solids**; prompt on **amorphous solids**]
<Chemistry>

12. A character in this story hears a sound like “a chorus of frogs on a spring evening” or “people laughing at you behind your back” after touching a five-year payment received upfront. That woman in this story has a “hard little place” at the center of her heart after she “married for love, and the love turned to dust.” This story’s protagonist forms a financial partnership with the gardener Bassett, which his uncle Oscar later joins. A house in this story is “haunted by the unspoken phrase: ‘There must be more money!’” The protagonist of this story exclaims “It’s Malabar!” before passing out, and tells his mother “I am lucky!” before dying. For 10 points, name this story in which Paul predicts the winner of races by riding the title toy, written by D.H. Lawrence.

ANSWER: “The **Rocking-Horse Winner**”
<British Literature>

13. In this state, Bill and Vonette Bright founded Campus Crusade for Christ, which later rebranded into the campus organization Cru (“crew”). While living in this state, the neo-pagan author Starhawk wrote the foundational text of the Goddess movement, *The Spiral Dance*. The most successful of the Human Potential Movement’s “grow centers” was this state’s Esalen Institute. The neo-Zoroastrian Mazdaznan movement is based in this state, which has the largest population of Zoroastrians outside of Iran and India. The African American preacher William J. Seymour led a racially integrated charismatic movement in this state, where Aimee Semple McPherson founded the Four Square Church. The Azusa Street Revival took place in, for 10 points, what state where many Scientologist celebrities live in Beverly Hills?

ANSWER: **California** [or **CA**]
<Religion>

14. This modern-day country contained “whispering columns” at a temple of Artemis and a mosaic studio at the House of the Tesseræ in a Decapolis city preserved by a 749 CE earthquake. PPN B residents of this country raised goats in Beidha and made plaster human statues in ‘Ain Ghazal (“GUZZ-all”). In 2021, Allen West’s Comet Research Group dubiously argued that a Tunguska-like airburst melted this country’s site of Tall el-Hammam, inspiring accounts of Sodom. This country contains Jerash, Byzantine mosaics in Madaba, and Roman Philadelphia. Aretas IV built this country’s Temple of the Winged Lions and Al-Khazneh behind the Siq gorge. Johann Ludwig Burckhardt visited the Treasury north of this country’s Wadi Rum (“room”) in a rock-cut Nabataean city. For 10 points, what country contains Petra and the citadel of Amman?

ANSWER: **Jordan** [or Hashemite Kingdom of **Jordan**; or Al-’**Urdunn** or Al-Mamlakah al-’**Urdunniyyah** Al-Hāshimiyyah] (Philadelphia was the Roman name for Amman. The earthquake was the 749 Galilee earthquake.)
<Other History>

15. This artist photographed twin boys next to a sign reading “Please Keep Off the Grass.” Bonnie Yochelson chronicled this photographer’s amateur assistants in a 2007 book titled “Rediscovering [him].” This photographer accidentally lit himself on fire with magnesium powder while pioneering indoor flash photography. This artist often photographed “growler gangs” of boys that he dubbed “Street Arabs.” This photographer frequently titled photos for their costs in cents, such as one of a man sleeping on a mattress on top of two barrels. Clotheslines in this artist’s photos of Bandit’s Roost and other Mulberry Street locations represent the “poverty line.” For 10 points, name this Danish American artist who photographed tenements for his collection *How the Other Half Lives*.

ANSWER: Jacob **Riis** (“reese”) [or Jacob August **Riis**; accept *Rediscovering Jacob Riis*]

<Other Fine Arts>

16. In this city, the one-eyed Simeon Brown falls in love with the Holocaust survivor Maria in the novel *The Stone Face*. Life is described as “occurring underwater” in a location in this city with windows painted white in lieu of curtains. A novel set (emphasize) *primarily* in this city opens with the narrator describing “the night which is leading [him] to the most terrible morning of [his] life.” At the end of a novel, a character who lives in this city asks a woman, “Isn’t it pretty to think so?” A character who titles a novel primarily set in this city strangles his former boss after a gay affair with the American man David ends. This city is the primary setting of James Baldwin’s novel *Giovanni’s Room*. For 10 points, name this city that Ernest Hemingway described in his memoir *A Moveable Feast*.

ANSWER: **Paris**, France (*The Stone Face* is by William Gardner Smith. “Isn’t it pretty to think so?” is a quote from Hemingway’s *The Sun Also Rises*.)

<American Literature>

17. A 3rd-century CE thinker with this name inspired a school of Renaissance philosophers led by Pietro Pomponazzi, which feuded over the immortality of the soul with Averroists like Agostino Nifo; that man from Aphrodisias was nicknamed “the commentator.” A man with this name was the purported addressee of a letter that circulated in the Middle Ages and influenced Roger Bacon, called the *Secretum Secretorum*. A man with this name was the most famous student of a philosopher whose other students, like Theophrastus, were called Peripatetics; Diogenes of Sinope (“SEE-noh-pee”) once asked that famous man of this name to move out of his sunlight. A military leader with this name sent donations to his teacher’s school, the Lyceum. For 10 points, give this name of a ruler who was tutored by Aristotle.

ANSWER: **Alexander** [or **Aléxandros**; accept **Alexander** the Great or **Alexander** III of Macedon; accept **Alexander** of Aphrodisias; accept the **Alexandrists**]

<Philosophy>

18. In 1987, elections empowered a president of this ethnicity from the Progressive Reform Party until he was dismissed in the “telephone coup” by the leader who ordered the December murders. After 1834, 450,000 immigrants of this ethnicity entered a depot in Trou Fanfaron in the “great experiment.” In 1953, Britain overthrew a socialist “father of the nation” of this ethnicity who broke with the rival PPP leader Forbes Burnham (“BURN-um”). This ethnicity created foods like doubles in the Caribbean, where they mixed with Africans to form the Douglá people. This largest ethnic group in Mauritius, Suriname, Guyana, and Trinidad included sugar-growing Jahajis and Girmityas (“gheer-MEET-yuhs”), who, like the Chinese, were often indentured laborers. For 10 points, what ethnicity’s diaspora is called desi?

ANSWER: **Indians** [or East **Indians**; accept **South Asians**; accept **Pakistanis**; accept specific Indian subgroups, such as **Tamils** or **Gujaratis** or **Sindhis** or **Punjabis** or **Bengalis**; accept **desi** before read; accept **Indo**-Caribbean; prompt on **Asians**; prompt on **Surinamese** or **Guyanese** or **Mauritian**] (The first line is about Ramsewak Shankar and Dési Bouterse. The second line refers to the Āpravāsī Ghāt in Port Louis. The third line is about Cheddi Jagan.)

<World History>

19. A post-minimalist album with this adjective in its title features excerpts of Czesław Miłosz (“CHESS-wahf MEE-wosh”) read by Tilda Swinton over viola and electronics on its track “Shadow Journal.” In a piece with this adjective in its title, a flute and clarinet represent the composer and her brother, Andrew, who died of skin cancer. The song “On the Nature of Daylight” appears on a Max Richter album in which this adjective describes “notebooks.” This adjective describes a “cathedral” in the title of a Jennifer Higdon piece. This adjective appears in the title of a jazz-inspired piece whose five main themes were inspired by a train ride after its composer was convinced to compose a work for Paul Whiteman’s “An Experiment in Modern Music.” A clarinet glissando opens, for 10 points, a George Gershwin “rhapsody in” what color?

ANSWER: **blue** [accept *Rhapsody in Blue*; accept *blue cathedral*; accept *The Blue Notebooks*]

<Classical Music>

20. Clay Armstrong injected these organisms with ammonium salts to determine how blocking affects inactivation rates. These model organisms replaced *Nitella* after K. S. Cole measured their rectification curves at Woods Hole. In these organisms, Rodolfo Llinás (“yee-NAHSS”) discovered microdomains of increased calcium in presynaptic terminals. A species of these organisms creates circadian (“sir-KAY-dee-un”) “counter-illumination” camouflage by expelling symbionts that perform *luxI/luxR* quorum sensing. Margaret McFall-Ngai found that the light organ of a Hawaiian species of these animals supports bioluminescent (“bio-luminescent”) *Aliivibrio fischeri*. The patch-clamp technique derives from studies of these animals’ giant axons, whose action potentials underlie the Hodgkin–Huxley model. For 10 points, name these two-tentacled, color-changing, ink-ejecting cephalopods.

ANSWER: **squid** [or **Decapodiformes**; accept **cuttlefish** or **Sepiida**; accept specific squid, such as bobtail **squid**; prompt on cephalopods or Cephalopoda before read; prompt on mollusks or Mollusca; prompt on coleoids or Coleoidea or Dibranchiata; reject “octopus”]

<Biology>

Tiebreaker. Footnotes are given in the rightmost of three columns in a 1,400-page experimental novel in this language whose plot occurs over a 25-hour period. The narrator of a novel in this language visits Thomas Abrams, who spends two decades building a painstakingly accurate model of the Temple of Jerusalem. John E. Woods translates literature from this language, including the difficult novels *Nobodaddy’s Children* and *Bottom’s Dream*. A book written in this language is titled for an architect who shares his name with a Napoleonic battle. A novelist who wrote in this language was known for using first-person narration and black-and-white photographs in books like *The Rings of Saturn* and *Austerlitz*. For 10 points, Arno Schmidt and W. G. Sebald wrote in what primary language of Austria?

ANSWER: **German** [or **Deutsch**]

<European Literature>

BONUSES

1. Elizabeth Fulhame introduced the concept of this type of chemical species when she observed oxidation reactions that required the presence of water. For 10 points each:

[10e] Name this type of substance that increases the rate of a chemical reaction without itself being consumed as one of the reactants.

ANSWER: **catalysts**

[10m] In the reactions that Fulhame studied, water was this type of catalyst because it is in the same phase as the reactants.

ANSWER: **homogeneous** catalyst [or **homogeneous** catalysis]

[10h] In contrast, heterogeneous catalysts exist in a different phase from the reactants and products, making the interaction strength between catalyst and substrate important. According to this principle, reaction rate is maximized for intermediate interaction strengths.

ANSWER: **Sabatier** principle

<Chemistry>

2. The Darboussier sugar factory is preserved as Memorial ACTe (“oct”) in this archipelago, whose rebel “La Mulâtresse Solitude” inspired a novel by André and Simone Schwarz-Bart. For 10 points each:

[10h] Name this archipelago where Magloire Pélagé and Louis Delgrès (“del-GREZ”) fought slavery in Matouba. The abolitionist Victor Hugues (“uwg”) briefly governed in this archipelago, which inspired *Windward Heights* by native author Maryse Condé (“muh-reese con-day”).

ANSWER: **Guadeloupe** [or **Gwadeloup**; prompt on Leeward Islands or Îles-Sous-le-Vent; prompt on Lesser Antilles or Antillean Islands or Petites Antilles; prompt on Les Abymes or Basse-Terre] (*Windward Heights* examines the lasting effects of Guadeloupe’s slave society after abolition.)

[10m] Guadeloupean sailors fought slavery in Curaçao (“CUR-uh-sao”) and Maracaibo with Alexandre Pétion, who led the Republic of Haiti before he died of this “tropical disease” that killed many French troops in Saint-Domingue.

ANSWER: **yellow fever** [or **yellow plague**; or **yellow fever** virus disease; prompt on Flavivirus or flaviviral diseases]

[10e] Before Pétion succumbed to yellow fever, he wrote letters to this man that Chelsea Stieber discusses in *Haiti’s Paper War*. This “Liberator” returned to Haiti with other refugees in 1816 before he abolished slavery in Venezuela.

ANSWER: Simón **Bolívar** [or Simón José Antonio de la Santísima Trinidad **Bolívar** y Ponte Palacios y Blanco; prompt on El Libertador]

<World History>

3. Practitioners of this improvisatory singing technique commonly use non-lexical vocables beginning with d, r, b, and l, such as in the phrase “diddly-dye, dary do.” For 10 points each:

[10h] Name this style of nonsense word singing meant to accompany Irish dance by imitating traditional instruments.

ANSWER: **lilting** [accept **mouth music**; accept **chin music** or **cheek music** or **gob music** or **puss music**; prompt on dye-diddling; prompt on humming]

[10m] Lilting may accompany this type of Irish dance in a compound meter, such as 6/8 (“six-eight”). This type of dance tune was adopted into European classical music as the concluding movement of Baroque suites.

ANSWER: **jig** [accept **jigging**; accept **gigue** or **giga**]

[10e] The Irish uilleann (“ILL-un”) variety of this instrument is inflated by squeezing bellows, unlike the Scottish “Great Highland” variety, which is inflated by mouth. In this type of instrument, a chanter and one or more drones receive a continuous airstream via a flexible enclosure.

ANSWER: bag**pipes** [accept uilleann **pipes**; accept Great Highland bag**pipe**]

<Other Fine Arts>

4. In a short story, an unnamed narrator who is terrified of dying in this manner discusses cases like the wealthy Frenchwoman Victorine Lafourcade, who met this fate. For 10 points each:

[10m] Name this manner of death also suffered by the title character of the story “Berenice.” Another story ends as a man suffering this fate exclaims, “For the love of God!” to which the protagonist replies, “Yes. For the love of God!”

ANSWER: being **buried** alive [or word forms like **burial**; or equivalents like living **inhumation**; accept **immurement** or being **walled in** or **entombed** or equivalents; accept “The Premature **Burial**”]

[10e] This author played on contemporary taphephobia, or fear of being buried alive, in stories like “The Premature Burial” and “The Cask of Amontillado” (“ah-mahn-tee-YAH-doh”).

ANSWER: Edgar Allan **Poe** [or Edgar **Poe**]

[10h] *Specific term required.* The narrator of “The Premature Burial” claims that his phobia is spurred by attacks of this “singular disorder.” In “The Fall of the House of Usher,” doctors diagnose Madeline with “transient affections” of this condition.

ANSWER: **cataplexy** [or word forms like **cataleptic**]

<American Literature>

5. This man metaphorically “fell helpless and broken on his knees before the Christian cross” according to an essay titled “How I Got Rid of [this man].” For 10 points each:

[10m] Name this man who was also criticized as “a symptom of nihilism” in a book subtitled “A Musician’s Problem.” This person wrote that only a “total” artwork could reestablish art’s community role in his Zürich writings.

ANSWER: Richard **Wagner** (“REE-kard VOG-nur”) [or Wilhelm Richard **Wagner**]

[10e] *The Case of Wagner* (“VOG-nur”) was a reversal from Friedrich Nietzsche’s (“NEE-chuhz”) earlier praise of Wagner in a book titled for the “birth of” this form of drama often contrasted with comedy.

ANSWER: **tragedy** [accept *The Birth of **Tragedy** from the Spirit of Music* or *Die Geburt der **Tragödie** aus dem Geiste der Musik*]

[10h] This other German thinker explained tragedy as when “our sensuous nature feels its limitations, but our rational nature feels its superiority.” This thinker asserted that the two title concepts bridge morality and aesthetics in the essay “On Grace and Dignity.”

ANSWER: Friedrich **Schiller** [or Johann Christoph Friedrich **Schiller**]

<Philosophy>

6. *Two answers required.* During the Revolutions of 1848, nationalists in these two principalities burned copies of the *Regulamentul Organic*, under which they were governed as protectorates of imperial Russia. For 10 points each:

[10h] Name these two Danubian principalities, which Alexandru Ioan (“YOOAN”) Cuza united in a “Little Union” to form a state later dominated by the “monstrous coalition” of conservative and liberal politicians.

ANSWER: **Moldavia** [or Principality of **Moldavia**; or **Moldova**; or Țara **Moldovei**] AND **Wallachia** [or Principality of **Wallachia**; or **Vlachia**; or Țara **Românească**]

[10e] In 1826, the Akkerman Convention required the governance of Moldavia and Wallachia to be approved by both Russia and this imperial power, which was labeled as the “sick man of Europe” until its collapse after World War I.

ANSWER: **Ottoman** Empire [or Devlet-i Aliye-i **Osmaniye**; or **Osmanlı** Devleti; or **Osmanlı** İmparatorluğu]

[10m] The “monstrous coalition” succeeded in overthrowing Cuza in 1866 and replaced him with this first Romanian monarch, who reigned until his death during World War I.

ANSWER: **Carol I** [or **Karl I** or **Charles I**; prompt on **Carol** or **Karl** or **Charles**; prompt on Prince of **Hohenzollern-Sigmaringen**]

<European History>

7. This quantity's corresponding quantum mechanical operators are defined as the generators of rotations. For 10 points each:

[10e] Name this vector quantity, usually denoted capital L , that is defined classically as " r cross p ."

ANSWER: **angular momentum** [or **angular momentum** operators; reject "momentum" or "linear momentum"]

[10h] Applying the spin operator $S_{\text{sub-z}}$ to an arbitrary spin one-half state shows that a rotation of this nonzero number of radians will bring the state back to the original state. The Dirac belt trick demonstrates that a rotation of this many radians is equivalent to not rotating spin one-half wavefunctions.

ANSWER: **4 pi** [accept multiples of 4 pi, such as **8 pi** or **12 pi** or **16 pi**]

[10m] This group and $SU(2)$ ("S-U-2") can be used to represent rotations. Any 3-by-3 matrix R that is an element of this group has a determinant equal to one and satisfies the following property: R times R -transpose equals one.

ANSWER: **SO(3)** ("S-O-3") [accept **special orthogonal** group of order 3; prompt on **rotation** group; reject "(general) orthogonal group"]

<Physics>

8. In this short story, the narrator attempts to read *Crime and Punishment* but instead finds a passage from *The Brothers Karamazov*. For 10 points each:

[10m] Name this posthumously ("POSS-chuh-miss-lee") published story in which the narrator hallucinates translucent versions of the title objects. This story's narrator is repeatedly tormented by thoughts about the main character's fate in the author's other story "Hell Screen."

ANSWER: "**Cogwheels**" [or "**Spinning Gears**"; or "**Haguruma**"]

[10e] This author wrote the autobiographical short story "Cogwheels." This author's other short stories include "Rashomon" and "In a Grove."

ANSWER: Ryūnosuke ("ryoo-NO-skay") **Akutagawa** [or **Akutagawa** Ryūnosuke]

[10h] In "Cogwheels," Akutagawa says that he gets an eerie feeling from a neighbor bowing to a deity with the head of this animal. In another Akutagawa story, Oshino Hanzaburō dies of a stroke and is brought back to life with the legs of this animal.

ANSWER: **horses** [or **equines**; or **uma**; accept **Horsehead Kannon** or "**Horse Legs**"]

<World Literature>

9. A. K. Ramanujan noted that "Doubles, shadows . . . reflections . . . are common in Indian myth and story." For 10 points each, answer the following about such doubles and variants of the *Ramayana*.

[10e] To protect this woman's chastity, the *Kūrma Purāṇa* claims that an illusory version of her is abducted by Rāvaṇa. This woman reunites with her husband, Rāma, after that shadow is destroyed in a fiery test of purity.

ANSWER: **Sītā** [or **Jānaki**; or **Maithili**; or **Vaidehi**; accept Maya **Sītā** or Chaya **Sītā**]

[10m] Wendy Doniger argues that, while the lustful Shūrpaṇakhā manifests emotions Sītā cannot openly exhibit, this younger brother of Rāma serves as his shadow, speaking "what Rama is too well-behaved to say." This man cuts off Shūrpaṇakhā's nose.

ANSWER: **Lakshmaṇa**

[10h] Rāvaṇa is fooled into giving up the real Pārvatī for a double by Vishṇu, who appears by a tree with this characteristic in a symbol "for the reality that underlies . . . life." Chapter 15 of the *Bhagavad Gita* describes a tree with this characteristic, asserting, "One who knows the secret of this tree is the knower of the Vedas."

ANSWER: **upside-down** [or **inverted**; accept answers indicating that the **roots grow upward** and the **branches** and/or **leaves grow downward**] (See Wendy Doniger's "Shadows of the Ramayana" and *Dreams, Illusion, and Other Realities* for more discussion of the episodes above.)

<Mythology>

10. In a version of this scene, the central figure is T-shaped to resemble a crossbow, reflecting the painting's commission by a guild of archers. For 10 points each:

[10m] Name this scene depicted by Rogier van der Weyden in a panel painting located in the Prado. A red-robed Saint John has one foot placed on a ladder in a depiction of this scene created for a cathedral in Antwerp.

ANSWER: the **Deposition** from the Cross [or the **Descent** from the Cross; or **Descent** of Christ; or **Deposition** of Christ; prompt on descriptions such as Christ being taken off the cross]

[10e] Van der Weyden was a contemporary of this other artist whose biblical scenes include an adoration in the center of his *Ghent Altarpiece*, which he made with his brother Hubert.

ANSWER: Jan **van Eyck**

[10h] Van der Weyden and Jan Gossaert both painted versions of a scene in which this person draws the Virgin Mary. Most major artistic guilds in early modern Europe were named for this person, such as one in Delft that included Jan Vermeer.

ANSWER: Saint **Luke** the Evangelist [or **Lucas** or **Loukâs** or **Lūqā'**; accept Guild of Saint **Luke**]

<Painting/Sculpture>

11. Answer the following about speakers on the Chautauqua circuit, for 10 points each.

[10e] This man emphasized the importance of religion in his "Prince of Peace" speech. During his 1896 presidential run, this supporter of bimetallism declared, "You shall not crucify mankind upon a cross of gold."

ANSWER: William Jennings **Bryan** [prompt on the Great Commoner]

[10h] In this speech delivered on the Chautauqua circuit, Russell Conwell declared, "You ought to get rich, and it is your duty to get rich." This speech instructed its audience to "dig in your own backyards" to find success.

ANSWER: "**Acres of Diamonds**"

[10m] This frequent lecturer on the Chautauqua circuit later won the 1931 Nobel Peace Prize for her pacifist efforts during World War I. Toynbee Hall inspired an institution created by this activist.

ANSWER: Jane **Addams** [or Laura Jane **Addams**] (The institution was Hull House.)

<American History>

12. Fikile Ntshangase, an activist known for opposing the extension of a mine extracting this resource near Hluhluwe–Imfolozi Park, was suspiciously murdered in her home in October 2020. For 10 points each:

[10m] Name this resource that is extracted from collieries in South Africa's Ecca deposits. Olaf Scholz's governing coalition wants to stop using this resource by 2030, in alignment with the UK-based bank NatWest.

ANSWER: **coal** [accept bituminous **coal** or **anthracite** coal or **lignite**; prompt on fossil fuels]

[10h] Coal-fired power stations in South Africa are operated by this state utility company, the largest greenhouse gas emitter in Africa. This company could face legal repercussions for trying to cover up violations of emission standards at its Kendal plant.

ANSWER: **Eskom** [or **Electricity Supply Commission**; or **EVKOM** or **Elektrisiteitsvoorsieningskommissie**]

[10e] Eskom's power plants create deadly levels of this environmental condition in South Africa. A 1963 act passed to reduce this condition in the US restricts the amount of particulate matter and ground-level ozone.

ANSWER: **air pollution** [accept **smog**; prompt on pollution; prompt on air quality] (The act is the Clean Air Act.)

<Current Events>

13. After stars enter this stage of their evolution, they generate energy through hydrogen fusion. For 10 points each:
[10e] Name this stage of stellar evolution that occupies a large diagonal band on an H–R diagram.

ANSWER: **main sequence**

[10h] Electron scattering is the main contributor to this quantity in upper main-sequence stars. According to Kramers’s law, this quantity is proportional to density times the negative seven halves power of temperature for free-free and bound-free interactions.

ANSWER: **opacity** [or **absorption coefficient**; accept Rosseland mean **opacity**; accept average **opacity**; accept line **opacity**; accept continuum **opacity**]

[10m] *Two answers required.* In low-mass main-sequence stars, the first of these two processes takes place in the core, while in more massive stars, the core is dominated by the other process. These two processes transport energy from a star’s core to its surface.

ANSWER: thermal **radiation** [accept **radiative** core] AND **convection** [accept **convective** core]

<Other Science>

14. In “The Monsters and the Critics,” J. R. R. Tolkien accepts “without argument” that *Beowulf* originated in an “age” named for this writer. For 10 points each:

[10h] Name this attributed author of a five-line “Death Song.” This writer’s magnum opus relates how the cowherd Caedmon (“CAD-mun”) miraculously received the ability to sing to compose his namesake hymn, which this writer preserved.

ANSWER: the Venerable **Bede** (“beed”) [or Saint **Bede**; or **Bede** the Venerable or **Beda** Venerabilis]

[10m] In Bede’s (“beed’s”) account, Caedmon (“CAD-mun”) gained the ability to sing during one of these events. One of these events “of the Rood” titles a poem, attributed to Caedmon, in which the cross narrates Jesus’s crucifixion.

ANSWER: **dreams** [accept *The Dream of the Rood*; prompt on sleeping]

[10e] Bede wrote texts of this type in the *Aenigmata* section of his *Liber epigrammatum*. “An onion” is the answer to a suggestive text of this kind in the Exeter Book, which likely inspired a contest of these things in *The Hobbit*.

ANSWER: **riddles** [prompt on puzzle or questions or brainteasers or similar]

<British Literature>

15. The book *Children, Race, and Power* notes that two psychologists with this surname both had parents from the West Indies and argues that they pioneered remedial education for mental health. For 10 points each:

[10m] Give this surname of two married psychologists who founded Harlem’s Northside Center for Child Development and conducted studies with dolls that were cited in *Brown v. Board of Education*.

ANSWER: **Clark** [accept Mamie **Clark** or Mamie **Phipps** Clark; accept Kenneth **Clark** or Kenneth Bancroft **Clark**]

[10e] In the Clark experiments, children compared dolls that differed in their hair and this trait. Frances Cress Welsing focalized groups often called “people of [this trait]” in her Afrocentrist psychology.

ANSWER: skin **color** [accept **colorism**; accept people of **color**; prompt on race or ethnicity; prompt on POC by asking “what does that stand for?”]

[10h] *Spanish or Portuguese term required.* The pervasive colorism in the Dominican Republic was exacerbated by Rafael Trujillo (“troo-HEE-yoh”) promoting this gradual process. Colonial Latin American caste systems entrenched this process of marrying light-skinned partners to supposedly “mejorar la raza” (“may-HO-rar lah rah-sah”).

ANSWER: **blanqueamiento** [or **blanquear** or **blanqueando**; or **branqueamento** or **branquear** or **branqueando**; reject “limpieza de sangre”]

<Social Science>

16. The Baroque-period cittern is similar to this other plucked string instrument. For 10 points each:
[10m] Name this instrument in the lute family that has four doubled metal strings. Antonio Vivaldi's C major concerto for this instrument is often paired with *The Four Seasons*.

ANSWER: **mandolin** [or **mandolino**; accept **Mandolin** Concerto in C Major, RV 425]

[10h] Another Vivaldi concerto in C-major is his RV 537, in which two players of these instruments act as soloists. Vivaldi's contemporary Giuseppe Torelli wrote over 30 concertos for one to four of these instruments.

ANSWER: **trumpet** [or **tromba**]

[10e] Vivaldi also wrote four "national" concertos for this instrument, but only *Il gran mogul* has survived until the present day. James Galway plays a gold version of this woodwind instrument, the lower cousin of the piccolo.

ANSWER: **flute** [or **flauto**; accept transverse **flute** or Western concert **flute**]

<Classical Music>

17. One of these creatures named Xanthippe ("zan-THIH-pay") helps a bureaucrat become mayor of New York City in Cynthia Ozick's novel *The Puttermesser Papers*. For 10 points each:

[10m] Name these creatures that can be destroyed by removing the aleph on their foreheads. Joseph draws a comic about one of these creatures at the end of *The Amazing Adventures of Kavalier and Clay*.

ANSWER: **golem**

[10h] A novel by this author takes the form of a lecture course given by the supercomputer Golem XIV ("fourteen"). Another novel by this author features "sallies" about "constructors" who build a robot that behaves like Maxwell's demon.

ANSWER: Stanisław ("stah-NYEE-swahf") **Lem** [or Stanisław Herman **Lem**]

[10e] This author retold the story of Rabbi Loew ("LOW") in his book *The Golem*. This author is better known for describing life in a concentration camp in *Night*.

ANSWER: Elie **Wiesel** [or Eliezer **Wiesel** or Eli'ezer **Vizel**]

<European Literature>

18. René of Provence ("pruh-VONCE") initiated a festival in which a turtle-shaped wooden effigy of a creature legendarily bested by this person was paraded around Tarascon. For 10 points each:

[10h] Name this saint who, according to the *Golden Legend*, tamed the person-swallowing tarasque. An apparition of this biblical woman made a 19th-century appearance in the Philippine town of Pateros.

ANSWER: Saint **Martha** of Bethany [accept Santa **Marta** de Pateros or Saint **Marta** of Pateros]

[10m] The French festival that celebrates Martha taming the tarasque takes place on or near this holiday. This holiday commemorates an event in which a "mighty rushing wind" descended upon a gathering of men who may have been celebrating Shavuot ("shah-voo-OAT").

ANSWER: **Pentecost** [or Feast of **Pentecost**; accept **Whitsunday**]

[10e] The tarasque tamer Martha of Bethany was one of this man's sisters. The shortest verse in the Bible describes Jesus weeping before resurrecting this man in the Gospel of John.

ANSWER: **Lazarus** of Bethany [or **El'azār**]

<Religion>

19. DNA's ability to transition from B to Z is positively correlated with this feature, which is generally high in Actinobacteria. For 10 points each:

[10m] Name or describe this feature, shown on genomic "skew" plots, whose variance is low in isochoric domains. Regions rich in this feature have higher PCR annealing temperatures due to hydrogen bonding and may contain methylated "islands."

ANSWER: **GC**-content [or **GC**-richness or **GC**-ratio; or **GC**-skew; accept descriptive answers like percentage of **guanine** and **cytosine**; accept **CpG** islands or **CpG** sites; prompt on **guanine** or **cytosine**]

[10h] GC content determines the stability of RNA secondary structures, like these "internal" sites in the 5' ("five-prime") UTR of the poliovirus genome. Picornaviruses and flaviviruses use these sequences to trigger cap-independent translation.

ANSWER: **IRES** ("iris") [or internal **ribosome entry** sites; accept specific types, such as type 2 **IRES**]

[10e] The live Sabin polio vaccine is attenuated by translation-impairing mutations in the IRES. Nonsense mutations prematurely introduce these triplet sequences that cause translation to terminate.

ANSWER: **stop** codons [accept **UGA** or **UAG** or **UAA**; accept **amber** or **ochre** or **opal** codons; prompt on **codons** or **termination** codons]

<Biology>

20. James I quipped that he learned "no bishop, no king," while siding with Richard Bancroft and the English bishops against John Rainolds and this group. For 10 points each:

[10e] Name this group that requested ecclesiastical reform in the Millenary Petition. King James's persecution of this group caused their emigration to New England, where members of the *Mayflower* established Plymouth Colony.

ANSWER: **Puritans** [prompt on **Pilgrims**; prompt on **Protestant** settlers]

[10h] Puritan demands in the Millenary Petition were rejected at this 1604 event. Bancroft was commissioned to oversee the production of the King James Bible during this event with aid from Rainolds.

ANSWER: **Hampton Court** Conference

[10m] In a 1599 tract, Rainolds called for "the overthrow of" these things, one of several activities whose bans were lifted after the restoration of Charles II. James I was allegorized as a "disguised ruler" in examples of these things.

ANSWER: **plays** [or **theater**; accept **dramas** or **comedy**; accept **stage works**; accept "The Overthrow of Stage-**Plays**"; prompt on **performing arts**; prompt on **ballads**; prompt on **masques**]

<Other History>

Extra. A thinker used the example of the morning star not always standing in for Venus to show that this concept for a sentence may be, but does not have to be, its truth value. For 10 points each:

[10m] Give this term that Gottlob Frege defined as the object that a word or sentence indicates, in contrast to the thought that it corresponds to.

ANSWER: **reference** [or **Bedeutung**]

[10h] In another essay, Frege refers back to his Venus and morning star example before discussing a problem concerning whether one of these things is or is not a concept. Frege proposed that the difficulty in interpreting his problem about one of these things stemmed from the use of quotation marks.

ANSWER: a **horse** [or ein **Pferd**; or an **equine**]

[10m] Frege's concept *horse* problem was published in a follow-up essay to a text titled for the "foundations" of this discipline. This mathematical subfield deals with the properties of numbers and simple operations like addition or multiplication.

ANSWER: **arithmetic** [accept *The Foundations of **Arithmetic*** or *Die Grundlagen der **Arithmetik***]

<Philosophy>