ACADEMIC COMPETITION FEDERATION

2023 ACF NATIONALS

Playoffs Round 10

Packet By

The Editors (10)

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TOSSUPS

1. Because this process favors Marcus–Coltrin paths on the concave side of a reaction pathway, it drives the "bobsled effect." In transition state theory, this process's impact on rate is added as a fudge factor using a zero-curvature approximation. Very high kinetic isotope effects that are not temperature-dependent indicate that this process controls a reaction's rate. For reactions that rely on this process, such as proton tautomerization or amine racemization, a factor symbolized capital Q is added to the Arrhenius equation. This process accelerates DNA mutagenesis and speeds up alcohol dehydrogenase in two examples of quantum biology. This process allows a helium nucleus to escape a huge electrostatic potential in Gamow's ("GAM-ovs") theory of alpha decay. For 10 points, name this process that speeds up reactions by allowing particles to pass under the activation energy barrier.
ANSWER: quantum **tunnel**ing [or **tunnel** effect; prompt on pyramidal inversion or umbrella inversion by asking "what physical process is the mechanism?"]
<Chemistry>

2. Merchants from this city fostered the growth of the metalworking Maykop culture in the Caucasus during this city's namesake "expansion." Most of the ceramics from a period named for this city are "beveled rim" bowls. This city absorbed the nearby town of Kullab. This city's "Limestone Temple" and "Stone Cone Temple" were built in a district that was dedicated to a deity honored in its "House of Heaven." According to legend, a ruler of this city invented writing to help his messengers deliver lengthy demands to the Lord of Aratta. The Ubaid period preceded this city's namesake "Protoliterate" period. The earliest extant version of a text describes a ruler of this city as "surpassing all other kings." This city's Mask of Warka likely depicts Inanna, who was worshiped in its E-anna temple. For 10 points, name this early Sumerian city that was legendarily ruled by Enmerkar and Gilgamesh.
ANSWER: **Uruk** [or **Erech**; or **Unug**-Kulaba; accept **Warka** until read; accept (Middle) **Uruk** Period; accept **Uruk** expansion; reject "Ur"]
<Other History>

3. *Description acceptable.* In John Updike's *Rabbit Redux*, Rabbit reads this literary scene aloud while Skeeter ejaculates on his couch. This scene is described as an "ideal speech situation" in a chapter titled for "Antinomies of Modernity" by Paul Gilroy, who reads it as a reworking of the German idealist thought that Ottilie Assing introduced to the author. Prior to this scene, Sandy gives the narrator a "root" that will ward off harm if it's kept on the right side of his body. In Chapter X ("ten") of a book, this scene is preceded by the line, "You have seen how a man was made a slave; you shall see how a slave was made a man." This scene unfolds over two hours in a horse stable, and results in a sadistic man nicknamed "the snake" never harming the protagonist again. For 10 points, identify this climactic scene from Frederick Douglass's autobiographies, in which he physically bests the man he's been leased to.
ANSWER: Frederick Douglass's **fight** with Edward **Covey** [accept **battle** or **struggle** or synonyms in place of "fight"; accept Mr. **Covey**, **Edward**, or descriptions like the slave-**breaker**, **farmer**, farm-**renter**, **boss**, or **master** in place of "Edward Covey"] (Paul Gilroy's *The Black Atlantic* compares the scene to Hegel's master-slave dialectic.)
<American Literature>

4. Certain stripe-shaped areas of this brain region are conspicuously absent in some squirrel monkeys, leading to the suggestion that those areas have no functional role. The unusual abilities of a patient known as "D.B." who had damage to this brain region were studied by Larry Weiskrantz. Lǐ Zhàopíng hypothesized that this area of the brain is responsible for creating a saliency map. Simple cells and complex cells were discovered in this brain region by a pair of researchers who inserted microelectrodes into this area of a cat's brain, named David Hubel and Torsten Wiesel. Goodale and Milner proposed that the dorsal and ventral streams emerging from this part of the occipital lobe are respectively responsible for action and perception. Brodmann area 17 is the "primary" part of this region, also known as V1. For 10 points, name this brain region that processes information from the optic nerve.
ANSWER: **visual cortex** [accept primary **visual cortex**; accept **striate cortex**; accept **V1** until read ; accept **Brodmann** area **17** until "17" is read; prompt on occipital lobe until read]
<Social Science>

5. Models based on Andrea Liu and Sidney Nagel's article "Jamming is not just cool any more" use a phase space of temperature, inverse density, and this quantity to analyze the jamming phase transition in granular materials. The critical value of this quantity resolved to a particular plane in a crystal is given by Schmid's law. For beams with a rectangular or circular cross section, this quantity reaches its maximum value at the neutral axis. The Tresca criterion is based on when the largest component of this quantity reaches a specified critical value. This quantity equals "torsion over the polar moment of inertia," all times "the radial distance to the surface in question" for a shaft subjected to torque. Components of this quantity are the off-diagonal elements of the Cauchy ("KOH-shee") tensor. For 10 points, tau denotes what quantity that is the force per area of a force parallel to the surface of a solid?
ANSWER: **shear stress** [accept **shear force** or **shear load** until "force" is read; prompt on stress; prompt on load or force until "force" is read]
<Physics>

6. This museum displayed 74 Impressionist and Post-Impressionist paintings from private German collections in the 1995 exhibition "Hidden Treasures Revealed." In a sequence set in this museum, a blind woman explains the symbolism of Van Dyck's *Virgin with Partridges* before she is turned around by a Catholic Marquis. British Museum director Neil Macgregor justified his 2014 decision to loan an Elgin Marble to this museum instead of Greece by calling it the other "first great museum of the Enlightenment." This museum, which houses James Cox's *Peacock Clock*, was founded for a collection that Johann Gotzkowsky assembled for Frederick the Great. Rembrandt's *Return of the Prodigal Son* and the Jordan Staircase are in this museum, which is the setting of a single-shot film by Alexander Sokurov. For 10 points, what museum complex occupies the Winter Palace in St. Petersburg?
ANSWER: **Hermitage** Museum [or State **Hermitage** Museum; or Gosudarstvennyj **Ermitazh**; prompt on Winter Palace or Zimnij dvorets until "Winter Palace" is read] (Sokurov's film is *Russian Ark.*)
<Painting & Sculpture>

7. The protagonist of a play set in this country haggles with a carpenter and his wife before a policeman catches their son with stolen baked goods. The "self-observation" of a scene where a fisherman's wife paddles a boat is mentioned in an essay about this country's traditions that took its key idea from Viktor Shklovsky. In a play set in this country, a suicidal pilot impregnates the protagonist, who had earlier received a thousand silver dollars for being the only one to grant three travelers a place to stay. The absence of the fourth wall in this country's theater allows the audience to distance themselves from the actors, according to an essay that coined the term "alienation effect." In a play set in this country, a sex worker impersonates her male cousin to save her tobacco shop. For 10 points, the play that inspired *The Caucasian Chalk Circle* was from what setting of Bertolt Brecht's *The Good Woman of Szechuan*?
ANSWER: **China** [or **Zhōngguó**; or People's Republic of **China** or **PRC**; or **Zhōnghuá** Rénmín Gònghéguó]
<European Literature>

8. An omen about one of these events precedes a dance of a "hundred drums" that was showcased during 2008's Republic Day celebrations. During this type of event, Meghalaya's Garo people honor Misi Saljong with the Wangala dance. The emperor worshiped at a "hall of prayer" dedicated to these events at Beijing's Temple of Heaven. The Mizo hold Chapchar Kut between two holidays dedicated to these events, Mim Kut and Pawl Kut, in order to exploit jhumming, a system centered on rabi and kharif items in Kerala. On a four-day holiday held during one of these events in the month of Tai, kolam patterns decorate thresholds and pots of milky porridge are allowed to overflow. These earthly events inspired a Tamil festival to Sūrya that coincides with Makar Sankranti, called Pongal. For 10 points, an equinox coincides with the end of what annual labor during China's Mid-Autumn Festival?
ANSWER: **harvest**s [accept **harvest** festivals; accept obtaining **crop**s or equivalents; accept Hall of Prayer for Good **Harvest**; prompt on agricultural festivals or farming or rice or similar answers; prompt on seasons or monsoon by asking "what type of event held during such a period?"]
<Religion>

9. Fathers in this ethnic group distribute wealth before dying and receiving a predator burial to avoid the curse of engooki. Newborns in this ethnic group are isolated in huts called inkajijik ("in-kah-jih-jik") for "three moons," after which they are named and have their heads shaved. This ethnic group's traditional god appears black when benevolent and red when spiteful and is named Enkai. Men of this ethnicity performing the *adamu* dance participate in a jumping contest. People of this ethnicity created the *elongo* shield and wear red blankets called *shuka*. A region named for this ethnic group and "spots" of bushy trees is the endpoint of the Great Migration of wildebeest. In 2022, people of this ethnicity were evicted from the Ngorongoro ("nn-gore-on-gore-oh") Conservation Area, part of their traditional cattle grazing lands on the Serengeti. For 10 points, name this nomadic ethnic group of Southern Kenya and Northern Tanzania.
ANSWER: **Maasai** [or Wa**masai**; accept **Maasai** Mara]
<Geography>

10. This ruler forced his sister to seal, with her own blood, a letter pleading her husband, Méi Yīn, to surrender before he was pushed off a bridge. This ruler sent Chén Chéng ("chun chung") to Samarkand and received the envoy of Ghiyāth al-dīn Naqqāsh. During this ruler's reign, the "three halls" were built in the Xiāngshān ("sh'yahng-shahnn") style by carpenter Kuǎi Xiáng ("kwai sh'yahng"). When this ruler moved the Imperial capital, he kept the "Yellow Registers" archived on an island in Lake Hòuhú ("ho-hoo"). This ruler commissioned Xiè Jìn ("shyeh jeen") to edit a biography of his recently canonized mother and a large encyclopedia only surpassed by the later *Sìkù Quánshū* ("sih-koo chwen-shoo"). The enthronement of this ruler ended the Jìngnàn Rebellion. During this ruler's reign, architects designed the Porcelain Tower in Nánjīng and the Forbidden City. For 10 points, name this emperor who first sent Zhèng Hé ("jung huh") on the Míng treasure voyages.
ANSWER: **Yǒnglè** ("yong-luh") Emperor [or **Yǒnglè** Dì; accept **Zhū Dì** or **Chu Ti**; prompt on Zhū or Chu]
(Ghiyāth al-dīn Naqqāsh represented the Timurid ruler Shah Rukh.)
<World History>

11. In one retelling, this character stops at the sight of a man's corpse in the market square on the way to her wedding to Allan Jones. While "confronting the audience as [himself] and not" this character, a man declares, "I go now to my living death." Another retelling recasts this character as Odale and a relative as Leicho in a commentary on Kwame Nkrumah's one-party state. An "African" version of this character subtitles a play by Femi Osofisan. A man argues with his friend over wearing a wig and fake breasts to act as this character before learning his friend's prison sentence was reduced to three months. A 1973 play ends with a performance of this character's trial and begins with two men digging sand to fill their wheelbarrows in a Robben Island-inspired prison. For 10 points, John helps his cellmate Winston rehearse his portrayal of what Sophocles character in Athol Fugard's *The Island*?
ANSWER: **Antigone** [accept *Tegonni: An African **Antigone***; prompt on *Tegonni*; prompt on Odale until read] (The play in the third sentence is Kamau Brathwaite's *Odale's Choice*.)
<World Literature>

12. A passage in this book that cites *The Hearings of the Scholars* connects the nine materials used to construct the Tower of Babel to the nine parts of speech and argues that the 72 assistants of Feniusa Fosa lend their names to the letters of the Ogham ("AW-gum") alphabet. The first chapter of this book examines the differences between refined court bards and vernacular gleemen before an extended gloss on the poem *The Battle of the Trees*. A passage in this book reinterprets the Judgment of Paris to actually represent agriculture being gifted to pastoralists by the title figure. This book, which was written concurrently with its author's novel *King Jesus*, argues that Stone Age rituals dedicated to a tripartite moon deity are preserved in surviving Welsh and Irish poems. For 10 points, name this book of mythography by Robert Graves named for a reconstructed ancient feminine deity.
ANSWER: *The **White Goddess*** [or *The **White Goddess**: a Historical Grammar of Poetic Myth*]
<Mythology>

13. The selective expression of proteins like MSI60 and MSI31 in different layers of these objects likely help control substrate polymorphs. These objects' resilience is partially due to a large, spring-like protein called lustrin A. These objects' matrices consist of beta-chitin ("KY-tin") sandwiched between beta-sheets of glycine and alanine-rich fibroin ("FY-broh-in")-like proteins, all coated in a layer of aspartic acid-rich proteins. These objects incorporate a material in which hexagonal, close-packed platelets form a regular "brick wall" structure. That biocomposite aragonite found in these objects is responsible for their iridescent structural coloration. These objects consist of a periostracum, a prismatic layer, and a lustrous nacreous layer. They're not trees, but these objects grow at their distal edges, leading to growth lines and characteristic spiral shapes. For 10 points, name these calcified protective structures formed by mollusks like conchs.
ANSWER: mollusk **shell**s [accept sea**shell**s; accept **valve**s; prompt on nacre until "nacreous" is read; prompt on mother-of-pearl; prompt on pearls; prompt on bivalves; prompt on exoskeletons]
<Biology>

14. A character in this novel who "understood the nature of cages" imagines cautiously walking round a "gilt cage" holding her romantic rival. Two characters in this novel tell each other "it's sacred" before consummating their relationship while visiting Lady Castledean at Matcham. A woman in this novel discusses the relationships of the four main characters at length with her much less talkative husband, Colonel Bob. Early in this novel, two characters visit a Bloomsbury shop whose proprietor understands Italian, but decline to purchase an object that they suspect has a hidden flaw. In this novel, the rich American art collector Adam marries Charlotte Stant, who has an affair with Prince Amerigo, the husband of Adam's daughter, Maggie Verver. For 10 points, name this Henry James novel titled for a drinking vessel.
ANSWER: *The **Golden Bowl***
<British Literature>

15. This musical's 1999 revival restored the song "I'll Share It All With You" and won Bernadette Peters her second and final Tony. A character in this musical sings about wanting a "simple" wedding, while his love interest wants one at the Waldorf with champagne and caviar. A group of illiterate characters in this musical performs a song that opens, "Folks are dumb where I come from" to the hotel owner Foster Wilson. This musical's librettist Dorothy Fields encouraged producers to cast Ethel Merman; in a conflict duet, Merman's character repeats "Yes I can" while her love interest says "No you can't." The jealous assistant Dolly attempts to sabotage this musical's climactic contest but is stopped by Sitting Bull. For 10 points, name this musical that features the Irving Berlin tunes "There's No Business Like Show Business" and "Anything You Can Do (I Can Do Better)," a show about a Wild West sharpshooter.
ANSWER: _**Annie Get Your Gun**_
<Other Fine Arts>

16. A longtime professor at this university founded the Computer Curriculum Corporation to promote computerized learning and wrote the book _Representation and Invariance of Scientific Structures_. A position developed primarily by philosophers at this university is summarized by the motto "If you can spray them, then they are real." Jon Barwise and John Perry developed situation semantics at this university's Center for the Study of Language and Information. A school of philosophy named after this university includes entity realists like Nancy Cartwright and Ian Hacking, and is known as this university's "disunity mafia" because of its opposition to the unity of science. Edward N. Zalta edits a resource that this university hosts. For 10 points, name this West Coast university that hosts a major online encyclopedia of philosophy.
ANSWER: **Stanford** University [accept _**Stanford** Encyclopedia of Philosophy_; accept **Stanford** School; accept **Stanford** disunity mafia; prompt on _SEP_ by asking "what does that stand for?"]
<Philosophy>

17. This politician denounced using celebrity to mask "nine days of training in eleven years" for a pilot who "could not fly any of the current air force planes" when blocking the promotion of television star Jimmy Stewart to brigadier general. This politician cited having the "nuclear capability but not the nuclear credibility" as a fault of President Kennedy during the Cuban Missile Crisis. This politician decried "irresponsible sensationalism" as falling into a Communist trap of "confuse, divide, and conquer" in a statement issued with six other senators whom an opponent called the "six dwarfs." This politician outlined the rights to "criticize" and "protest" as basic principles of "Americanism" to counter the "Four Horsemen of Calumny" adopted by the Republican Party. For 10 points, name this female senator from Maine who opposed Joseph McCarthy in the "Declaration of Conscience" speech.
ANSWER: Margaret Chase **Smith** [or Margaret Madeline **Chase**; or Margaret Madeline Chase **Smith**]
<American History>

18. *Note to moderator: Read the answerline carefully.*
David Kempe, Jon Kleinberg, and Éva Tardos proved guarantees for algorithms on these data structures that approximate answers to a problem posed by Pedro Domingos and Matt Richardson. Messages on these data structures are updated using either a sum-product rule or a max-product rule in belief propagation algorithms. An algorithm on these data structures uses teleportation operations to avoid spider traps; that algorithm operates on one of these data structures with a bow tie-like structure. In spectral clustering, *k*-means clustering is performed on the eigenvectors of one of these data structures' Laplacian matrix. PageRank operates on one of these data structures built from web pages. A giant connected component is contained in one of these data structures that represents the World Wide Web. For 10 points, networks are represented with what data structures that contain nodes and edges?
ANSWER: **graph**s [accept undirected **graph**s, directed **graph**s, **graphical** models, social **graph**s, social network **graph**s, or web**graph**s; accept **tree**s; prompt on social _network_s or Bayesian _network_s until "networks" is read by asking "what data structures are used to represent such networks?"; prompt on _Markov random field_s after "sum-product rule" is read by asking "what data structures are used to represent Markov random fields?"; prompt on _adjacent list_s or _adjacency matrix_es or _adjacency matrices_ by asking "those are representations of what data structures?"; reject "neural networks," "matrix," "matrices," or "lists"] (The first sentence is about algorithms for influence spreading through a social network.)
<Other Science>

19. This composer sued the publisher James Longman, establishing a precedent for the copyright of written musical works. This composer's Opus 18 includes three symphonies written for two antiphonal orchestras. This composer is credited with giving the first public demonstration of the piano. This composer premiered his cantata *Cefalo e Procri* at a public concert series he founded with his friend Carl Friedrich Abel. This composer mentored a young Mozart, who arranged several of this composer's sonatas as piano concertos and later described this composer's death as "a loss to the musical world." This composer wrote that his brother in Berlin "lived to compose," while he "composed to live" while working as a court musician for Queen Charlotte. For 10 points, name this youngest son of J.S. Bach, who composed many works in the galant style while living in London.
ANSWER: Johann **Christian Bach** [or **J.C. Bach**; prompt on J. _Bach_ or Johann _Bach_; prompt on the London _Bach_ until "London" is read; reject "Johann Sebastian Bach" or "J.S. Bach"]
<Classical Music>

20. A pope's nephew named Niccolò Ludovisi gained this region's name as an honorary appellation after fighting a war in it. A force hoping to relieve this region was harmed by the death of François de Vendôme and a powder magazine explosion that sank its flagship, the *Thérèse* ("tay-REZ"). When veterans of a war in this region were paid in valueless "red coins," they hung a set of ministers from a *Platanus* tree in the "Vakvak Incident." To mitigate increasing costs of a war in this region, Turhan appointed a member of the Köprülü family as grand vizier. The unpopularity of a war centered on this region led Sultan Ibrahim to be deposed in favor of Mehmed IV, who continued the war on this island for two decades. The Ottomans conducted a 21-year siege of this island's Venetian-ruled capital city, Candia. For 10 points, a 17th-century war centered on what island and its fortress at modern-day Heraklion?
ANSWER: **Crete** [or **Kriti**; accept **Cretan** War or **Girit**in Fethi; accept **Candia** or Guerra di **Candia** or Niccolò da **Candia** until "Candia" is read]
<European History>

BONUSES

1. This poetry collection titles both a song cycle and an orchestral rhapsody by George Butterworth. For 10 points each:
[10m] Name this collection of poetry, parts of which were also set by Arthur Somervell and Ivor Gurney. A piano and string quartet accompany a song cycle from this collection titled *On Wenlock Edge.*
ANSWER: *A **Shropshire Lad***
[10e] A.E. Housman denounced this composer's song cycle *On Wenlock Edge* after it left out several verses of one of his poems. This composer also wrote the *London* and *Sea* symphonies.
ANSWER: Ralph **Vaughan Williams** [prompt on Williams]
[10h] This other English composer set Thomas Hardy poems in his song cycles *Earth and Air and Rain* and *By Footpath and Stile.*
ANSWER: Gerald **Finzi** [or Gerald Raphael **Finzi**]
<Classical Music>

2. The 16th-century Flemish philosopher Justus Lipsius ("YOOST-us LIP-see-us") attempted to synthesize this ancient philosophy with Christianity. For 10 points each:
[10e] Zeno of Citium founded what school of philosophy that also included Seneca?
ANSWER: **Stoic**ism
[10h] Lipsius is best known for a Senecan dialogue with his friend Langius that praises this quality as the chief virtue. Seneca addressed his friend Serenus in an essay titled for this virtue "of the wise."
ANSWER: **constancy** [or **constance**; accept **firm**ness; accept **steadiness**; accept **steadfast**ness; accept *De **Constantia** Sapientis* or *On the **Firm**ness of the Wise*; accept *De **Constantia** Libri Duo*]
[10m] This Renaissance thinker was similarly inspired by Seneca to write the book *Remedies for Fortune Fair and Foul*. This man also rediscovered a collection of letters by Cicero.
ANSWER: **Petrarch** [or Francesco **Petrarca**]
<Philosophy>

3. Chlorobenzene is used as an antisolvent during this process to improve the crystallinity of perovskite solar cells. For 10 points each:
[10h] Name this technique of preparing thin films by centrifuging a volatile ink that spreads out and dries on the target substrate. It is an easy way to make photoresists for microfabrication.
ANSWER: **spin coat**ing [or **spin cast**ing; prompt on coating or casting]
[10e] Painting with perovskite inks is far easier than the traditional method of making photovoltaic silicon: the "chemical vapor" form of this phase transition from a gas to a solid.
ANSWER: **deposition** [or **desublimation**; or **deposit**ing; accept chemical vapor **deposition**; prompt on CVD by asking "what does that stand for?"]
[10m] Due to its toxicity, chlorobenzene is being phased out as an antisolvent in favor of this greener organic solvent. This ester is the product when a two-carbon alcohol condenses with a two-carbon carboxylic acid.
ANSWER: **ethyl acetate** [or **EA**; or **ethyl ethanoate** or **EtOAc**; or **ETAC**]
<Chemistry>

4. Martha Nussbaum styled a speech praising the virtues of both of these foods on Hecuba's Lament from *The Trojan Women*. For 10 points each:
[10h] Name these two foods that are contrasted in an annual mock-academic debate hosted at the University of Chicago. One of these foods is often topped with applesauce while the other is often filled with lekvar.
ANSWER: **latke**s AND **hamantash** [accept **Latke**–**Hamantash** debate; accept **hamantash**en, **homentash**, **homentash**n, **Haman**'s **pocket**s, **Haman**'s **ear**s, or **oznei Haman** in place of "hamantash"; prompt on potato pancakes in place of "latkes"]
[10e] During his speech at the Latke–Hamantash debate, Michael Silverstein noted that it wasn't a coincidence that the English translation of the letters on these four-sided Hanukkah tops spell out "Tums."
ANSWER: **dreidel** [or **dreidle**]
[10m] Allan Bloom's contribution to the debate joked that the Latke–Hamantash conflict was orchestrated by this New Jersey-based company, the world's largest matzo producer. It dominates the kosher wine market along with Kedem.
ANSWER: **Manischewitz** [or The **Manischewitz** Company]
<Religion>

5. Answer the following about exhumed corpses across world history, for 10 points each.
[10e] This U.S. president's eyebrows had completely vanished when his corpse was exhumed for reburial in Springfield, Illinois, to which it had been transported after his assassination.
ANSWER: Abraham **Lincoln**
[10m] This man's corpse was exhumed in 1892 to show in a glass coffin, but it was found in 1977 to be the wrong body. Forces loyal to "El Mozo" killed this man after his brothers captured El Mozo's father in battle at Las Salinas.
ANSWER: Francisco **Pizarro** [or Francisco **Pizarro** González]
[10h] This woman's romantic relationship with Peter I of Portugal led his father, King Afonso IV, to kill her. After this woman's death, Peter reportedly exhumed her corpse, made her queen, and forced his nobles to kiss her clothes.
ANSWER: Inês de **Castro** [or **Inês** de Castro]
<Other History>

6. The protagonist reveals that her work is autobiographical after her writing workshop leader criticizes its lack of realism in this author's story "Jumping Monkey Hill." For 10 points each:
[10m] Name this author who created a protagonist who dates a Yale professor named Blaine, who bonds with her over their shared passion for Barack Obama.
ANSWER: Chimamanda Ngozi **Adichie**
[10h] A memoir by this other Nigerian writer recalls how their classmates of color were too intimidated to turn in any writing in their writing class. This author explored Ada's embodiment as an ogbanje in their 2018 debut *Freshwater*.
ANSWER: Akwaeke **Emezi** (The memoir is *Dear Senthuran*.)
[10e] Matthew Salesses's book on Westernized writing workshops examines this novel's racist description of African speech. This novel is the subject of Chinua Achebe's "An Image of Africa."
ANSWER: ***Heart of Darkness*** (Salesses's book is *Craft in the Real World*. Joseph Conrad wrote *Heart of Darkness*.)
<World Literature>

7. Joseph Story drew on the Contract Clause in a dissent for a case regarding the construction, over this river, of a toll-free bridge that put an adjacent bridge out of business. For 10 points each:
[10m] Name this river upon which a city's "associates" established a "manufacturing company" based on a similar business in the town of Beverly.
ANSWER: **Charles** River [accept ***Charles** River Bridge v. Warren Bridge*] (The "Boston Associates" operated the Boston Manufacturing Company out of Waltham.)
[10e] Needing more hydropower, an "associate" with this surname shifted textile production to the Merrimack River. Young "Mill Girls" staffed vertically integrated production centers in a labor system named after Waltham and a city with this name.
ANSWER: **Lowell** [accept **Lowell**, Massachusetts; accept Waltham-**Lowell** system; accept Francis Cabot **Lowell**]
[10h] Under this person, the "Mill Girls" organized into the Lowell Female Labor Reform Association, which distributed a number of "Factory Tracts" and published the periodical *The Offering*.
ANSWER: Sarah **Bagley** [or Sarah George **Bagley**]
<American History>

8. The line-interactive type of these devices regulates utility voltage before the voltage passes through any equipment. For 10 points each:
[10m] Name these devices that protect against power interruption to allow for graceful shutdown or for operation to continue until a generator comes online.
ANSWER: **UPS**s [or **uninterruptible power supply** or **uninterruptible power supplies** or **uninterruptible power source**s; prompt on power supply or power supplies or power sources]
[10e] Line-interactive UPSs use one of these components equipped with a tap changer. These components use paired windings to adjust the voltage of alternating current.
ANSWER: **transformer**s
[10h] Line-interactive UPSs always have one of these components connected, though sometimes in reverse. The three-phase type of these components can be built using a full bridge configuration containing three pairs of switches, with one switch in each pair conducting for 180 degrees at a time.
ANSWER: **inverter**s [or power **inverter**s]
<Physics>

9. A poem by this author inspired a landscape painting in which a forest funeral is surrounded by goats roaming around abandoned ruins and a farmer plowing. For 10 points each:
[10m] Name this author who appears leaning on a cane as a companion points with a paintbrush at the Kaaterskill Falls in an 1849 painting commissioned for him by Jonathan Sturges.
ANSWER: William Cullen **Bryant**
[10e] Asher Durand's painting *Kindred Spirits* depicts Bryant and this Hudson River School artist of *The Titan's Goblet* and *The Architect's Dream*.
ANSWER: Thomas **Cole**
[10h] Bryant was a friend of this artist, who derived his idea of naked bodies as the "unveiled soul" from Emanuel Swedenborg. Andrew Jackson praised this artist of *Eve Tempted* as "true to nature" for creating a toothless bust of him.
ANSWER: Hiram **Powers**
<Painting & Sculpture>

10. In the last chapter, the narrator of this novel interrupts the description of a storm by saying "here pause: pause at once," so that "sunny imaginations" can "picture union and a happy succeeding life." For 10 points each:
[10h] Name this 1853 novel whose ending leaves the main love interest's fate ambiguous. Its last paragraph imagines Madame Beck, Père Silas, and Madame Walravens living long, prosperous lives.
ANSWER: *__Villette__*
[10e] The ambiguous ending of *Villette* contrasts with the ending of this novel by the same author. This novel's last chapter begins by stating "Reader, I married him" in reference to Mr. Rochester.
ANSWER: *__Jane Eyre__* [or *__Jane Eyre__: An Autobiography*] (Charlotte Brontë wrote both novels.)
[10m] The last paragraphs of *Jane Eyre* are devoted to this character, who ends the novel by traveling to India as a missionary.
ANSWER: **St John** ("SIN-jin") Rivers [or St John Eyre **Rivers**; reject "John"]
<British Literature>

11. Some of the ten "golden rules" in an Austrian "society" named for this movement include "Take your camera everywhere you go" and "Don't worry about any rules." For 10 points each:
[10h] Name this photographic movement whose adherents use plastic toy cameras like the Diana and the Holga. It takes its name from the Russian company that made the LC-A camera.
ANSWER: **lomography** [accept **Lomographic** Society; accept the **LOMO** LC-A or **Lomo** Kompakt Automat]
[10m] The Lomographic Society sells a lens with a "control ring" for this feature, which refers to the aesthetics of the out-of-focus aspects of a photo. Its name comes from the Japanese for "blur."
ANSWER: **boke**h
[10e] The revival of analog photography has benefited this company that made the first instant color film. Users of this company's SX-70 camera do not actually have to shake them to dry the film faster.
ANSWER: **Polaroid** Corporation
<Other Fine Arts>

12. A "mud wizard" confronted police during coal protests in this country, which powered down its last nuclear plants in April 2023. For 10 points each:
[10e] Name this largest economy in Europe and end point of the Nord Stream 2 pipeline from Russia.
ANSWER: **Germany** [or **Deutschland**; or Federal Republic of **Germany**; or Bundesrepublik **Deutschland**]
[10m] In February 2023, this reporter released an article claiming that a Norwegian sonar buoy set off C-4 explosives that destroyed parts of Nord Stream 2. This reporter exposed the My Lai Massacre.
ANSWER: Seymour **Hersh** [or Sy **Hersh**; or Seymour Myron **Hersh**]
[10h] Alongside Saxony and Saxony-Anhalt, this German state has lagged in green energy development. In December 2022, Heinrich XIII was arrested for a coup plot from his castle in this state, where the AfD first contributed to a winning coalition with the election of Thomas Kemmerich in 2020.
ANSWER: **Thuringia** [or **Thüringen**; or Free State of **Thuringia** or Freistaat **Thüringen**]
<Current Events>

13. After Graham Linehan challenged eligibility from the Big Lottery Fund for a charity named for these creatures, streamer Hbomberguy raised 340,000 dollars for it from a 57-hour stream of *Donkey Kong 64*. For 10 points each:
[10m] Identify these creatures that name a British charity for transgender youth that challenged the LGB Alliance's charitable status in 2022.
ANSWER: **mermaid**s [prompt on merfolk or merpeople]
[10h] This psychologist argued that children have a "compulsion to dominate and manipulate" due to female responsibility over parenting in her only book, *The Mermaid and the Minotaur*.
ANSWER: Dorothy **Dinnerstein**
[10e] This 2017 film by Guillermo del Toro inverts traditional mermaid stories by having a mute custodian fall in love with an amphibian man held in a laboratory.
ANSWER: The ***Shape of Water***
<Other Academic>

14. A form of this technique measures neutron absorbance with arrays of scintillators to determine the densities and fissile masses of layers of the test object. For 10 points each:
[10m] Name this class of imaging techniques used to study the internal structure of objects by "stacking" 2D transmission cross sections.
ANSWER: **tomography** ("tuh-MAH-grah-fee") [accept any form of **tomography** like computed **tomography** scans, computed axial **tomography** scans, positron emission **tomography**, neutron **tomography**, X-ray **tomography**, or electron **tomography**; prompt on PET or CT or CAT scan by asking "what does that stand for?"; prompt on scans or scanning]
[10e] Tomographic reconstruction is an inverse problem that tries to find a 2D image given the results of performing this operation on the image many times. This operation maps an object to one less dimension, such as representing a 3D object on a flat surface.
ANSWER: **projection** [or **project**ing or other word forms of **project**]
[10h] This term is used for any image used to test tomographic reconstruction algorithms, such as the image of 10 overlayed ellipses introduced by Lawrence Shepp and Benjamin Logan.
ANSWER: **phantom** [accept Shepp–Logan **phantom**]
<Other Science>

15. In a 2017 novel, a laconic immigrant of this nationality makes his way across the American West while inexplicably growing in size. For 10 points each:
[10h] Name this nationality of a picaresque giant in Hernán Díaz's novel *In the Distance*. The bounty hunter Homer T. Hatch arrives to capture a harmonica-playing farmhand of this nationality in a book the author called a "short novel."
ANSWER: **Swedish** [or **Swedish**-American; or **Swede**s; or **svenska**r] (The short novel is *Noon Wine* by Katherine Anne Porter.)
[10e] The Swedish-American Berglund family works a farm in Nebraska in *O Pioneers!*, one of this author's novels about immigrant families on the Great Plains.
ANSWER: Willa **Cather** [or Willa Sibert **Cather**; or Wilella Sibert **Cather**]
[10m] This author wrote that every publisher rejected his story "A Country Full of Swedes" for being "a denial of man's nobility." This author made the photobook *You Have Seen Their Faces* with his wife, Margaret Bourke-White.
ANSWER: Erskine **Caldwell** [or Erskine Preston **Caldwell**]
<American Literature>

16. Alī Abd al-Rāziq published *Islam and the Bases of Political Authority* in reaction to this empire's dissolution, arguing that no political states should draw legitimacy from religion. For 10 points each:
[10e] Name this empire whose end was recognized during the Conference of Lausanne ("low-ZAWN"), which replaced the Treaty of Sèvres ("SEVR") signed after World War I.
ANSWER: **Ottoman** Empire [or Devlet-i Aliye-i **Osmaniye**; or **Osmanlı** Devleti; or **Osmanlı** İmparatorluğu; accept **Ottoman** Sultanate or **Ottoman** Caliphate]
[10m] This second Turkish president negotiated the dissolution of the Ottoman Empire at Lausanne and was responsible for affirming the "Six Arrows" ideology implemented by Mustafa Kemal Atatürk.
ANSWER: İsmet **İnönü** ("ee-NUN-oo") [or Mustafa **İsmet** İnönü]
[10h] İnönü ("ee-NUN-oo") supported these projects meant to train teachers loyal to the "Six Arrows" ideology. They were later phased out in the 1950s since educated peasants threatened the regime.
ANSWER: **Village Institute**s [or **Köy Enstitüleri** or **Köy Enstitüsü**; prompt on Village Teacher Training School or Köy Muallim Mektebi; prompt on Village Instructor Training Course or Köy Eğitmen Kursu]
<World History>

17. Each heavy chain of this heterotetrameric protein consists of a head connected by a "neck linker" to a stalk ending in a C-terminal tail. For 10 points each:
[10m] Name this protein family whose "walking" motion has been proposed to proceed via either a "hand-over-hand" or "inchworm" mechanism.
ANSWER: **kinesin**s [accept **kinesin** motor domain superfamily; prompt on motor proteins]
[10e] Experiments to determine the true mechanism of "walking" kinesin used constructs with solvent-exposed residues mutated to this amino acid, whose sulfhydryl group can be conjugated to Cy3 ("sigh three") or Cy5 ("sigh five").
ANSWER: **cysteine** [or **Cys**; or **C**]
[10h] Cy3 and Cy5 are a popular pair of dyes for this nanometer-scale technique. Rice et al.'s paper suggesting hand-over-hand motion used this technique to demonstrate the kinesin neck linker's motion when kinesin binds ATP.
ANSWER: **smFRET** [or **single-molecule fluorescence resonance energy transfer**; or **single-molecule Förster resonance energy transfer**; prompt on FRET or fluorescence resonance energy transfer or Förster resonance energy transfer
<Biology>

18. One of this author's stories for children is about a cat with an injured paw who buys a dozen balloons to travel. For 10 points each:
[10h] Name this Russian author who founded the avant-garde group OBERIU ("OH-burr-oo") with Alexander Vvedensky. This author's brief and absurdist short stories are collected in the book *Today, I Wrote Nothing*.
ANSWER: Daniil **Kharms** [or Daniil Ivanovich **Kharms**]
[10m] OBERIU was one of the last offshoots of this movement, whose adherents incorporated sounds into the invented language *zaum* and wrote the manifesto "A Slap in the Face of Public Taste."
ANSWER: Russian **Futurism** [or Russkiy **futurizm**]
[10e] Kharms wrote a story in which this author repeatedly trips over Nikolai Gogol. "A Slap in the Face of Public Taste" lists this author among those who should be thrown from the "ship of modernity," presumably drowning like Parasha in this author's poem "The Bronze Horseman."
ANSWER: Alexander **Pushkin** [or Alexander Sergeyevich **Pushkin**]
<European Literature>

19. This ruler's reign included the so-called "Moderate Decade" and the "Progressive Biennium." For 10 points each:
[10m] Name this non-English ruler whose ouster in the Glorious Revolution ushered in the Democratic Sexennium, which included the election of Amadeo of Savoy as king.
ANSWER: Queen **Isabella II** of Spain [or Doña **Isabella II** of Spain; or Queen **Isabel II** of Spain; or **Elizabeth II of Spain**; prompt on Queen Isabella or Isabel or Elizabeth II]
[10h] After the Sexennium, Antonio Cánovas implemented a system of contrived elections in which these local political bosses manipulated democratic institutions. These bosses resembled *caudillos* ("cow-DEE-yohs"), who typically held more widespread, military power.
ANSWER: **cacique**s ("kah-SEE-kays") [accept *caciquismo*]
[10e] The power of both Cánovas and the *caciquismo* ("kah-see-KEEZ-moh") system declined in the lead-up to this war. The Generation of '98 formed in response to this war, after which Spain lost most of its remaining colonial possessions.
ANSWER: **Spanish–American** War [or Guerra **hispano-estadounidense**]
<European History>

20. This model uses rules based on Conway's Game of Life to govern how agents move around a grid whose cells contain different amounts of a certain food. For 10 points each:
[10h] Name this agent-based social simulation developed by Joshua M. Epstein and Robert Axtell.
ANSWER: **Sugarscape**
[10m] Sugarscape was inspired by a paper by this economist, who introduced the game-theoretic notion of the "focal point" in his book *The Strategy of Conflict*.
ANSWER: Thomas **Schelling** [or Thomas Crombie **Schelling**]
[10e] That Schelling paper modeled this phenomenon. Kenneth and Mamie Clark's doll experiments were cited in a Supreme Court case that ruled that this practice in public schools is unconstitutional.
ANSWER: racial **segregation** [or word forms of **segregate**; accept "Models of **Segregation**"] (The case was *Brown v. Board of Education*.)
<Social Science>