



2023 PACE NSC

Edited by David Bass, Jordan Brownstein, Jaimie Carlson, Ganon Evans, Athena Kern, Joseph Krol,
Young Lee, Adam Silverman, Chandler West
Head Editor Ganon Evans

Round 14 - Tossups

1. *Two answers required.* These two characters become vampires in a Jordan Galland film which references a pun-filled W. S. Gilbert parody named for these people. These characters tell a man “you’d be lost for words, you’d be tongue-tied” while threatening to cut out his tongue. These characters substitute different nouns in the phrase “Give us this day our daily bread.” On a boat, one of these characters stabs an actor with a (*) prop sword. One of these men flips a coin heads up ninety-two times. These characters often mix up which of them is which in a play that ends with English ambassadors making an announcement about these people to Horatio. For 10 points, name these two friends of Hamlet, who, in a Tom Stoppard play, “Are Dead.”

ANSWER: **Rosencrantz** AND **Guildenstern** [accept in either order; accept *Rosencrantz and Guildenstern Are Dead* or *Rosencrantz and Guildenstern Are Undead*]

<Jaimie Carlson, Literature - British - Drama> ~26004~ <Editor: Jaimie Carlson>

2. One of these figures stands under an arch in contrapposto style in a Greek-inspired depiction on a casket made from gold and inlaid rubies. One of these figures appears seated in a red sandstone sculpture from Lèshān (“luh-shan”) that is the tallest pre-modern sculpture in the world. These figures are centrally positioned on the Bimaran casket, and their lives are depicted in caves in a horseshoe shape at Ajanta. One of these figures was depicted in a 180-foot-tall statue hewn from a sandstone cliff in (*) Bamiyan, and destroyed along with its companion piece by the Taliban. These figures are often depicted touching the ground in *mudras*. In Ayutthaya, the sculpted head of one of these figures protrudes from a *bodhi* tree. For 10 points, name these religious figures, the first of whom was Siddhārtha Gautama.

ANSWER: **Buddhas** [accept *buddhatva* or *buddhatta* or *buddhabhāva*; accept Siddhārtha **Gautama** before mention]

<Yingzhi Nyang, Fine Arts - Sculpture> ~25716~ <Editor: Chandler West>

3. Aldsworth and Bridgers found that keeping this variable constant at a factory caused workers to develop low-level sensory deprivation. An increase in this variable provided by “moontowers” increased commerce and was thought to decrease crime when installed in several cities in the 19th century. Elton Mayo found that worker productivity did *not* change with this variable but did change when workers were observed, a phenomenon dubbed the (*) Hawthorne Effect. People are exposed to less of this variable per day at the borders of time zones, the negative effects of which have been used to justify not making a timekeeping policy permanent. For 10 points, people with low levels of vitamin D may not be exposed to enough “natural” form of what phenomenon?

ANSWER: **lighting** [or natural **light** or artificial **light**; or **daylight** or **light** level]

<Michael Bentley, Social Science - Other> ~25404~ <Editor: Athena Kern>

4. This quantity's transfer rate divided by the product of area and the driving force concentration difference equals this quantity's "transfer coefficient," denoted k_{sc} . Choked flow imposes a limit on this quantity's time derivative. The equation (read slowly) " $d\rho/dt$ equals negative rho times the divergence of u " describes the conservation of this quantity in the Euler equations of fluid dynamics. The logarithm of the ratio of this quantity's (*) "wet" and "dry" forms appears in the Tsiolkovsky rocket equation. This quantity is conserved in closed systems. An object sinks in a fluid if the acceleration due to gravity times this quantity is greater than the weight of fluid displaced. For 10 points, name this quantity equal to density times volume.

ANSWER: mass [prompt on m]

<Lalit Maharjan, Science - Physics> ~25009~ <Editor: David Bass>

5. Note to moderator: read answerline carefully. This president's political opponents attacked him for handing over *Hermione* mutineer Thomas Nash to be hanged by the British in Jamaica. Publisher Matthew Lyon won reelection from jail after attacking the "selfish avarice" of this president. New taxes imposed by this man's administration prompted an auctioneer to rally Pennsylvania Dutch farmers in Fries's Rebellion. A bill signed into law by this president increased from five years to fourteen years the minimum time needed for (*) naturalization and was passed during the Quasi-War with France. This president's appointment of a "midnight judge" prompted the case *Marbury v. Madison*. This Federalist signed the Alien and Sedition Acts into law. For 10 points, name this president who succeeded George Washington.

ANSWER: John Adams [accept answers like the elder Adams; prompt on Adams or J. Adams; reject "John Quincy Adams"]

<Michael Bentley, History - American - Pre-1865> ~25734~ <Editor: Michael Bentley>

6. A poem in this collection states that "our own heart exceeds us" and asks "think of the hands / how they rest without weight." In A. S. Kline's translation, this collection ends by describing "the emotion / that almost dismays us, / when a joyful thing falls." In this collection, the narrator imagines "the grieving for Linos ("LIE-noss")" and states that "if one were to suddenly / take me to its heart, I would vanish into its / stronger existence" in a poem that claims that (*) "beauty is nothing but the beginning of terror." This ten-poem collection includes the line "every angel is terrifying." For 10 points, the line "who, if I cried out, would hear me among the Angelic orders?" opens what collection by Rainer Maria Rilke ("RAI-nur mah-REE-uh RILL-kuh")?

ANSWER: Duino Elegies [or Duineser Elegien]

<Michael Borecki, Literature - European - Poetry> ~14351~ <Editor: Joseph Krol>

7. Thomas Friedman wrote an infamous op-ed admiring how this leader kept him up to 1:30 a.m. with "new ideas for transforming his country." This avid gamer owns 96 percent of the gaming company SNK. As the youngest defense secretary in the world, this leader oversaw the disastrous Operation Restoring Hope in a neighboring country. This leader placed billionaires from the (*) Talal family under house arrest for corruption in a Ritz-Carlton. As part of his Neom smart city project, this leader began work on a 170-kilometer-long project called The Line. This leader's appointment to Prime Minister in 2022 may have been motivated by sovereign immunity from lawsuits from Jamal Khashoggi's family. For 10 points, name this Crown Prince of Saudi Arabia often known by his three-letter initials.

ANSWER: Mohammed bin Salman Al Saud [or MBS; prompt on partial answer; prompt on al Saud]

<Michael Bentley, Current Events - World> ~24978~ <Editor: Ganon Evans>

8. Letter frequencies in this type of text are represented graphically on a WebLogo and numerically using a position-weight matrix. FASTA (“fast-uh”) files store this type of text, which is often provided alongside a chromatogram with green, red, blue, and black peaks. The letter N indicates lack of consensus at a position or motif in one of these strings. One of these strings is queried against a database in a (*) BLAST (“blast”) search, which aligns these texts to identify SNPs (“snips”) or to construct a phylogenetic tree. One of these strings with three billion characters, measured with only a few gaps from telomere-to-telomere, was the output of the Human Genome Project. For 10 points, what type of text uses strings of As, Cs, Ts, and Gs to represent genes?

ANSWER: DNA sequences [or sequencing data; accept DNA or deoxyribonucleic acid sequences; accept nucleic acid or nucleotide sequences; accept RNA or ribonucleic acid sequences; accept genes or gene sequences or genomes or genetic sequences until “genome” is read, and prompt on it afterwards; accept protein sequences, but reject “proteins” alone]

<Adam Silverman, Science - Biology> ~25461~ <Editor: Adam Silverman>

9. With Carl Friedrich Abel, a composer with this first name established a series of public benefits concerts. That composer with this first name worked in London and was contrasted with his half brother of the same last name nicknamed for a different European city. Rising broken C major chords open the first piece in a collection by a composer with this first name organized by a rising (*) chromatic pattern. That piece by a composer with this first name was used as the accompaniment line in Charles Gounod’s “Ave Maria.” The BWV catalogue includes works by a composer with this first name who wrote a collection of 24 preludes and fugues in each major and minor key. For 10 points, give this first name of the German composer of *The Well-Tempered Clavier*.

ANSWER: Johann [accept Johann Christian Bach or Johann Sebastian Bach or Johann Christian or Johann Sebastian; prompt on J; prompt on John]

<Ethan Ashbrook, Fine Arts - Music - Baroque> ~25476~ <Editor: Young Lee>

10. This region was home to the Greek-speaking Gothic state of Theodoro. Suleiman the Magnificent’s wife Roxelana was trafficked through a city in this region whose slave trade was controlled by Devlet I Giray (“ghee-rye”). A khanate based in this region called Little Tartary was the longest-surviving successor state to the Golden Horde. The Black Plague entered Europe via corpses lobbed into this region’s Genoese colony of Kaffa. (*) Fake villages along the Dnieper (“d’NEE-pur”) in this region were built by Gregory Potemkin to woo Catherine the Great after its peaceful annexation. A war named for this region included the Charge of the Light Brigade. The Russian Black Sea fleet is based out of Sevastopol in, for 10 points, what peninsula?

ANSWER: Crimea [or the Crimean Peninsula; or Tauris or Taurica or Tauric Peninsula; accept Crimean War or Krym khakhad aral; accept Crimean Tatars or Qirimtatarlar; accept the Crimean Khanate; accept Southern Crimea; prompt on the Black Sea before mentioned]

<Ganon Evans, History - European - 1500-1900> ~25858~ <Editor: Michael Bentley>

11. This novel’s opening “Author’s Note” states that it “was begun in Trondheim and finished in San Francisco” while its author was on a tour of the world’s “penal and correctional institutions.” This novel’s first paragraph describes climbing seven miles to Carisbrooke via “a lovely road that runs from Ixopo into the hills.” In this novel, an engineer obsessed with Abraham Lincoln dies in a burglary, which means he never finishes writing “The Truth About (*) Native Crime,” an essay that advocates for racial justice. The protagonist receives a letter about Gertrude’s illness at the start of this novel, which describes the murder of Arthur Jarvis by Absalom, the son of Stephen Kumalo. For 10 points, name this 1948 novel by Alan Paton.

ANSWER: Cry, the Beloved Country

<Joseph Krol, Literature - World and Miscellaneous> ~25913~ <Editor: Joseph Krol>

12. A thinker *born in this modern-day country* left unfinished *The Doctrine of Reconciliation*, part of his enormous work *Church Dogmatics*. A 20th-century religious leader from this country wrote a commentary on Romans that greatly influenced the foundation of the theology of crisis. That thinker from this country, a founder of the Confessing Church, was named Karl Barth. A religious leader from this modern-day country defended the eating of sausages during Lent. After fleeing to this country, one leader enforced the (*) exclusive use of the Book of Psalms in worship and wrote the *Institutes of the Christian Religion*, which promoted the theory of predestination. For 10 points, name this country home to Huldrych Zwingli and John Calvin, who preached in Geneva.

ANSWER: Switzerland [or Swiss Confederation; or der Schweiz or Schweizerische Eidgenossenschaft or Confédération suisse or Confederazione Svizzera or Confederaziun svizra or Confoederatio Helvetica]
<Andrew McCowan, RMP - Christian Practice> ~25582~ <Editor: Athena Kern>

13. Electronic energies in these elements are measured by differential of quanta, or *Dq*. These elements' orbitals are renamed for two *gerade* ("juh-RAW-duh") symmetry groups when they bond along the coordinate axes and separate by an energy gap symbolized delta. One of these elements is the first exception to the *Aufbau* principle because it loses a valence electron at quantum number *n* to half-fill the (*) "*n* minus 1" subshell. Visible light excites electronic transitions in these elements to give their ions color. An 18-electron rule replaces the octet rule for these elements, the first to fill the five "*L* equals 2" orbitals. These elements bond to ligands in coordination complexes. For 10 points, the *d*-block comprises what elements in the center of the periodic table?

ANSWER: transition metals [or d-block metals until it is read; or TMs; prompt on metals; reject "alkali metals" or "alkaline earth metals"] (The third sentence refers to chromium.)
<Adam Silverman, Science - Chemistry> ~25219~ <Editor: Adam Silverman>

14. During a famine caused by one of these events, Yahya Khan notoriously told victims to "eat roti" rather than rice to recover. A casino called the Balinese Room opened after one of these events ended a Victorian "golden era" in the "Wall Street of the Southwest." One of these events that coincided with a war prompted Ravi Shankar to hold a relief concert. The deadliest one of these events in history, called *Bhola*, contributed to (*) Bangladeshi independence. A large wall was built following one of these events in 1900 that killed over 6,000 people in Galveston. During one of these events in 2005, many people took shelter in the Superdome. For 10 points, New Orleans was devastated by what type of natural disaster named Katrina?

ANSWER: hurricane [or tropical cyclone; or typhoon; or tropical depression; or tropical storm; prompt on flooding or storm]
<Michael Bentley, History - Cross, Historiography, and Miscellaneous> ~23826~ <Editor: Michael Bentley>

15. A set of sessions by a player of this instrument accompanied by Benny Goodman's band were collected on the 1972 album *Solo Flight*. The Wynton Kelly Trio album *Smokin' at the Half Note* was recorded with a musician who played this instrument and includes one of his standards titled "Four on Six." One player of this instrument had two left hand fingers fused together due to burns and composed the standard "Nuages"; that (*) Roma musician, along with Stéphane Grappelli, founded the Quintette du Hot Club de France. Wes Montgomery and Django Reinhardt played this instrument. Along with piano, bass, and drums, this instrument typically makes up a jazz band's rhythm section. For 10 points, what instrument is made in Flying V and Les Paul models by Gibson and has six strings?

ANSWER: jazz guitar [accept electric guitar or acoustic guitar]
<Benjamin Chapman, Fine Arts - Jazz> ~25438~ <Editor: Young Lee>

16. One woman known for this trait is told to eat noodles vomited up by beggars; in another story, that woman born with six hairs obtained this trait by eating only silicate. A series of trials that involved returning gold utensils and guarding goats allowed a man who had the Yellow Millet Dream to obtain this trait. The Queen Mother of the West co-hosts feasts with a food that confers this trait. A pill that confers this trait is gifted to an (*) archer after he shoots down nine suns, though his wife Cháng'è (“chang-UH”) takes it first. Hé Xiāngū and Lǚ Dòngbīn are among eight beings named for this trait. Sūn Wùkōng protects peaches that grant this trait. For 10 points, name this trait Qín Shǐ Huáng failed to achieve, as shown by his death by mercury.

ANSWER: immortality [or any clear reference to living forever or not dying or being unkillable; accept xiān; accept Eight Immortals or Eight Drunken Immortals or bā xiān; accept Peaches of Immortality or xiāntáo; accept eternal youth; prompt on answers like longevity or living long or invulnerability;
<Lalit Maharjan, RMP - World Mythology> ~25492~ <Editor: Jaimie Carlson>

17. This author ended a book by questioning the “meaning of so tiny a being as the [...] sea lace.” Dorothy Freeman potentially began a romantic relationship with this author after moving to a seaside cottage in Maine. This author wrote a book which describes a “strange blight” of “white granular powder” in its first chapter, “A Fable for Tomorrow.” This author won the National Book Award for *The Sea Around Us*, which was inspired by her time as a (*) marine biologist in the Bureau of Fisheries. In her most famous book, this author highlighted the detrimental effects of bioaccumulation on human health and ecosystems. The dangers of DDT were described by, for 10 points, what author who warned against pesticides in *Silent Spring*?

ANSWER: Rachel Carson [or Rachel Louise Carson]
<Yingzhi Nyang, Literature - American - Nonfiction> ~25422~ <Editor: Chandler West>

18. Note to moderator: read answerline carefully. A rapid construction method developed under this ruler made use of standardized *talatat* blocks. This ruler was accused of sending gold-plated wooden statues instead of solid gold ones in letters sent by King Tushratta of Mittani. This ruler held a Sed festival unusually early in his reign, possibly indicating that he initially co-ruled with his father (*) Amenhotep III. The artist Thutmose depicted this ruler’s wife in a polychrome limestone bust. At this ruler’s capital of Amarna, archaeologists found a relief depicting this ruler worshiping a disc with hands emanating from it. For 10 points, name this husband of Nefertiti and father of Tutankhamun, a pharaoh who promoted monotheistic worship of the sun god Aten.

ANSWER: Akhenaten [or Echnaton; or Akhenaton; or Amenophis IV; accept Amenhotep IV until “Amenhotep” is read, prompt afterwards; prompt on Amenhotep]
<Lalit Maharjan, History - World - Miscellaneous> ~25916~ <Editor: Jordan Brownstein>

19. This book imagines a mind wandering from an ongoing war to Roman pennies to illustrate what it calls a “train of thought.” Like Saint Anselm, this book references the Psalms in a passage refuting a fool who has “said in his heart” that “there is no such thing as Justice.” This book argues that we should always seek peace and keep our contracts in a list of “laws of nature.” This book’s vision of its title subject as “an artificial (*) man, though of greater stature... than the natural” is literally illustrated on its frontispiece. This book argues that we should form a commonwealth under an absolute sovereign to escape a “war of all against all” in which life is “nasty, brutish, and short.” For 10 points, name this magnum opus of Thomas Hobbes.

ANSWER: Leviathan [or Leviathan or *The Matter, Forme and Power of a Commonwealth Ecclesiasticall and Civil*]
<Jordan Brownstein, RMP - Philosophy> ~25020~ <Editor: Jordan Brownstein>

20. This type of radiation is reflected at shallow angles via grazing incidence optics in Wolter telescopes. The first comprehensive survey of the sky for this type of radiation was performed by a satellite proposed by Riccardo Giacconi, Uhuru. Binaries featuring a donor star and an acceptor neutron star or black hole predominantly emit this type of radiation. Depending on its energy, this type of radiation can be “hard” or “soft.” This type of radiation is studied by NASA’s (*) Chandra Observatory. The black hole in Cygnus is named for this type of radiation, which it emits at wavelengths of several angstroms. For 10 points, Wilhelm Röntgen discovered what type of electromagnetic radiation with slightly higher frequency than ultraviolet radiation?

ANSWER: X-rays [accept X-ray binaries or hard X-rays or soft X-rays or Cygnus X-1 or Chandra X-ray Observatory; prompt on EM radiation or electromagnetic radiation before “electromagnetic” is read]
<Joseph Krol, Science - Astronomy> ~25980~ <Editor: David Bass>

21. In 1926, an author who used both this language and a less-spoken relative of it became the second woman to win the Nobel Prize for Literature on the strength of novels such as *Reeds in the Wind*. This language was used for a novel in which two girls throw dolls into the basement of a loan shark while growing up in the 1950s. Novels like *Those Who Leave and Those Who Stay* and *My Brilliant Friend* appear in a series written in this language by a (*) pseudonymous author. In an absurdist play in this language, the Mother and the Father interrupt the Stage Manager because they are two of the title *Six Characters in Search of an Author*. For 10 points, name this language used by Grazia Deledda (“GRAHT-zee-ah day-LAY-dah”), Elena Ferrante (“eh-LAY-nah fair-AHN-tay”), and Luigi Pirandello.

ANSWER: Italian [or Italiano]
<Joseph Krol, Literature - European - Long Fiction> ~25880~ <Editor: Joseph Krol>

NSC 2023 - Round 14 - Bonuses

1. In 2022, Mexican activists hacked the audioguides for a bright green artifact made of these objects currently held in Vienna. For 10 points each:

[10m] Name these things, which the *amanteca* class wove into artworks. The Aztec goddess Cōātlīcue (“koe-AT-lee-kway”) was magically impregnated by a ball of these things, out of which was born Huītzilōpōchtli (“wee-tsee-low-POTCH-tlee”).

ANSWER: **feathers** [accept **plumage**; accept **plumas**]

[10h] This goddess became enraged at her mother Cōātlīcue’s pregnancy by feathers, but she is defeated by Huītzilōpōchtli and her decapitated head is thrown into the air to be the moon. The Huēyi Teōcalli (“WAY-ee tay-oh-CALL-ee”) was excavated after the 1978 discovery of a stone depicting this goddess’s dismembered body.

ANSWER: **Coyolxāuhqui** (“koh-yohl-SHAO-kee”)

[10e] This other Aztec god was known as the “Feathered Serpent.” His heart turned into the planet Venus after he sacrificed himself on a funeral pyre.

ANSWER: **Quetzalcoatl** (“KET-sull-koh-AH-tull”)

<Jaimie Carlson, RMP - World Mythology> ~20955~ <Editor: Jaimie Carlson>

2. In 1978, photographer Janet Parker was killed by this virus after a sample of it leaked through air ducts at a research hospital, seeding a mini-outbreak in England. For 10 points each:

[10e] Name this deadly virus. Just two years later, in 1980, the WHO declared it had been eradicated.

ANSWER: **smallpox** virus

[10h] To prevent leaks, research on smallpox or Ebola can now only be conducted in the small number of labs that rate a 4 on this ranking system for the risk of biohazards. Its name is a three-letter initialism.

ANSWER: **BSL** [or **BSL-4**; or **biosafety level** system; prompt on **containment** levels]

[10m] In 2021, France declared a moratorium on research into these infectious agents after a researcher accidentally injected herself with a contaminated forceps and died of Creutzfeldt-Jakob (“CROYTS-felt YAH-kub”) disease.

ANSWER: **prions** [prompt on misfolded **proteins**]

<Adam Silverman, Science - Biology> ~20836~ <Editor: Adam Silverman>

3. L. L. Zamenhof’s 1887 work *Unua Libro* outlined this language, which was inspired by Zamenhof’s multilingual childhood in Bialystok, Poland. For 10 points each:

[10e] Name this constructed, auxiliary language designed for easy universal use. Its name roughly translates to “one who hopes” in a Romance language.

ANSWER: **Esperanto**

[10m] In this film, Jewish shop signs such as that of a barber are rendered in Esperanto. Charlie Chaplin delivers a speech in favor of democracy in this film that criticizes Adolf Hitler.

ANSWER: *The **Great Dictator***

[10h] Anna Tuschinski became known as the “Mother of Esperanto” for her organizational work in this city. A crown and two white crosses on a red flag symbolized this free city that imposed customs over a corridor between Pomerania and East Prussia.

ANSWER: **Danzig** [accept the Free City of **Danzig** or Freie Stadt **Danzig**; accept **Gdańsk** or Wolne Miasto **Gdańsk**]

<Michael Bentley, Other - Other Academic and General Knowledge> ~20149~ <Editor: Ganon Evans>

4. Answer the following about the genre painter Pieter Aertsen, for 10 points each.

[10h] One of Aertsen's most famous scenes shows this kind of stuff hanging in front of a painting of the Holy Family giving alms. A Velazquez portrait inspired a modern artist to place Innocent X ("the tenth") between two pieces of this stuff.

ANSWER: **meat** [prompt on animal carcasses or animal skeletons] (The second painting is Francis Bacon's *Figure with Meat*.)

[10e] The aforementioned painting by Aertsen depicts two fish forming this shape. This religious object is central to a "White" Marc Chagall painting which depicts a burning synagogue on its right.

ANSWER: **cross** [prompt on *White Crucifixion* or crucifix by asking "what object is central to a crucifix?"]

[10m] In another genre scene by Aertsen, he painted a man dancing to a bagpipe while moving one of these objects in a chalk circle. A flower emerges from one of these objects being held by a hand in Dali's *Metamorphosis of Narcissus*.

ANSWER: **eggs** [or *The Egg Dance*; or *De eierdans*]

<Hari Parameswaran, Fine Arts - Painting - European to 1600> ~21098~ <Editor: Chandler West>

5. This author used his son Hikari as the basis for a novel whose narrator tries to define words like "death." For 10 points each:

[10m] Name this Japanese author of *Rouse Up O Young Men of the New Age!*, who wrote about 15 adolescent boys abandoned in a plague-stricken village in *Nip the Buds, Shoot the Kids*.

ANSWER: Kenzaburo **Ōe** ("OH-ay")

[10h] Due to his son having a suspected brain hernia, this protagonist of Ōe's novel *A Personal Matter* replaces his son's diet of milk with sugared water.

ANSWER: **Bird** [or **Tori**]

[10e] Other Ōe character names include that of a boy in *Rouse Up O Young Men of the New Age!* whose name derives from this depressed donkey that accompanies Winnie the Pooh in A. A. Milne short stories.

ANSWER: **Eeyore**

<Yingzhi Nyang, Literature - World and Miscellaneous> ~20224~ <Editor: Joseph Krol>

6. This phenomenon occurs when the sampling rate is less than the Nyquist rate. For 10 points each:

[10m] Name this phenomenon in which signals in a sample are indistinguishable, leading to temporal artifacts like the stroboscopic effect and the wagon-wheel effect.

ANSWER: **aliasing** [accept temporal aliasing; reject "anti-aliasing"]

[10e] The Nyquist-Shannon sampling theorem gives that the Nyquist rate is twice the greatest value of this quantity present in a signal. This quantity can be measured in hertz.

ANSWER: **frequency** [prompt on f or nu]

[10h] When sampling below the Nyquist rate, aliasing can be mitigated by the application of these filters that attenuate frequencies in a signal that are greater than a given cutoff. Simple moving averages act as these filters and finite impulse response filters.

ANSWER: **low-pass** filters [or **high-cut** filters or **treble-cut** filters]

<David Bass, Science - Engineering and Miscellaneous> ~21309~ <Editor: David Bass>

7. A character horrifies an I.W.W. Secretary by proclaiming he wants to blow up all the steel in the world then send a letter to Mildred signed by one of these animals. For 10 points each:

[10h] Name these animals, one of which resembling Rodin's *The Thinker* kills Yank in the last scene of a 1922 play.

ANSWER: **ape** [accept *The Hairy Ape*; accept **gorilla**; reject "monkey"]

[10e] *The Hairy Ape* was created by this author who chronicled the Tyrone family in his play *Long Day's Journey Into Night*.

ANSWER: Eugene **O'Neill**

[10m] The title character of this O'Neill play, an escaped convict and former Pullman Porter, is killed in its last scene by a silver bullet while on the run.

ANSWER: *The **Emperor Jones***

<Ganon Evans, Literature - American - Drama> ~21034~ <Editor: Chandler West>

8. A novel by Cán Xuě ("can shweh") draws on the author's time working in this specific profession. For 10 points each:

[10h] Give this two-word term for lightly trained medical workers that provided basic medical services to the Chinese countryside starting in the Cultural Revolution.

ANSWER: **barefoot doctors** [or *chìjiǎo yīshēng*; prompt on doctors]

[10m] Although barefoot doctors increased health access in China, this event exposed many weaknesses in the Chinese health system. This epidemic killed at least 700 people in the early 2000s.

ANSWER: 2002-2004 **SARS** epidemic [or **severe acute respiratory syndrome** outbreak or **SARS-CoV-1** outbreak]

[10e] The term "barefoot doctor" was first used at the Chiangchen People's Commune outside this city. This city in the Yangtze Delta is currently the most populous in China.

ANSWER: **Shanghai**

<Michael Bentley, History - World - Asian> ~20150~ <Editor: Jordan Brownstein>

9. Despite being founded in 1900, this orchestra won its first Grammy in 2022 for their recording of two of Florence Price's symphonies. For 10 points each:

[10h] Name this American orchestra that was the first to make music recordings using electric technology. This orchestra performed the music for Disney's *Fantasia*.

ANSWER: **Philadelphia** Orchestra

[10e] The Philadelphia Orchestra's first electrical recording was of *Danse macabre* by Camille Saint-Saëns, which uses this wooden keyboard percussion instrument pitched higher than the marimba to invoke the dancing of skeletons.

ANSWER: **xylophone**

[10m] The orchestra was led in its heyday by Leopold Stokowski, who famously conducted in this manner. Pierre Boulez conducted in this manner, and Valery Gergiev often conducts either in this manner or with a toothpick.

ANSWER: conducting **without** a **baton** [accept equivalents indicating the conductor **does not use** a physical **baton**; accept conducting with their **hands**]

<Ethan Ashbrook, Fine Arts - Music - 1900 to 1970> ~20923~ <Editor: Young Lee>

10. A reaction mechanism can be chosen from a list of candidates by measuring the dependence of this quantity on concentration at time equals zero. For 10 points each:

[10m] Name this quantity that usually follows an integer-exponent power law with concentration. Empirical laws named for this quantity are written in both “differential” and “integrated” forms.

ANSWER: reaction **rate** [or **rate** law; reject “rate constant”; reject “k”]

[10h] Another way to narrow down a list of mechanisms is to measure this effect. In this effect, deuterium substitution only slows down a reaction if proton transfer is rate-limiting.

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

[10e] Biochemists suss out reaction mechanisms using isotopes like tritium or carbon-14 which are easy to detect because they have this property. Marie Curie discovered elements that have this property.

ANSWER: **radioactive** [or **radioactivity**; or undergoing radioactive **decay**; or emitting **radiation**; or **radiating** or other word forms; accept any specific types of **decay** like alpha **decay** or beta **decay**]

<Adam Silverman, Science - Chemistry> ~20834~ <Editor: Adam Silverman>

11. *Exact phrase required.* A book titled for this two-word phrase describes an author’s perception of John Locke as a symbol of “evil, superstition, and tyranny,” and elucidated his mythology to argue that he was not mad. For 10 points each:

[10m] Give this two-word phrase. One poem’s first stanza asks “what immortal hand or eye / could frame thy [this two-word phrase]?”

ANSWER: **fearful symmetry**

[10h] *Fearful Symmetry* is an analysis by this Canadian thinker who divided fiction into modes and proposed five levels of symbolism in his 1957 book *Anatomy of Criticism*.

ANSWER: Northrop **Frye**

[10e] Frye’s *Fearful Symmetry* is an analysis of this English poet of *Songs of Innocence and Experience*.

ANSWER: William **Blake**

<Ganon Evans, Literature - British - Poetry> ~20111~ <Editor: Jaimie Carlson>

12. Answer the following about the Kingdom of León getting larger, for 10 points each.

[10e] León’s borders grew in the first half of this 781-year period of Christian expansion over Muslim kingdoms in Iberia.

ANSWER: **Reconquista** [accept the **Reconquest** of Spain or **al-Istirdad**; prompt on suqut al-Andalus]

[10h] In 924 CE, León emerged as a consolidation of former states of this kingdom. The heir to the Spanish throne is known as the Prince of this mountainous region, which resisted Moorish conquest at the Battle of Covadonga.

ANSWER: Kingdom of **Asturias** [or **Asturum** Regnum; or Reinu d’**Asturies**]

[10m] After León’s Alfonso the Brave conquered Toledo, a school for this activity was founded in the city’s cathedral. In England, both John Wycliffe and William Tyndale attracted the ire of the church for engaging in this heretical activity.

ANSWER: **translation** [accept **translating** the Bible or **translating** into English or Latin or Spanish; prompt on writing or book publishing]

<Ganon Evans, History - European - Middle Ages> ~20387~ <Editor: Michael Bentley>

13. Lars Onsager used a transfer-matrix method to analytically solve a model describing this phenomenon in 2D. For 10 points each:

[10m] Name this phenomenon that is modeled by a lattice of interacting spins in the Ising model. In nature, this phenomenon typically has no net effect because it only occurs within microscopic “domains.”

ANSWER: **ferromagnetism** [accept word forms; prompt on word forms of magnetism]

[10e] The 2D Ising model is one of the simplest models that can exhibit these processes exemplified by sublimation and deposition.

ANSWER: **phase transitions** [or **phase changes**]

[10h] The Ising model is often studied with these numerical simulation methods, exemplified by the Metropolis–Hastings algorithm, that traverse a system’s state space with stochastic steps that depend only on the current state.

ANSWER: **Markov chain Monte Carlo** methods [or **MCMC** methods; prompt on **Monte Carlo** methods or **MC** methods; reject “Markov chains”]

<Benjamin Chapman, Science - Physics> ~20909~ <Editor: David Bass>

14. Creating an economy that can grow without accentuating this problem is the goal of decoupling. For 10 points each:

[10e] Name this general problem, which many countries have tried to address by imposing a carbon tax to reduce greenhouse gas emissions.

ANSWER: **climate change** [or **global warming**; prompt on descriptions of **environmental damage** or other **environmental issues**]

[10m] This market-based policy has been introduced in China and the E.U. to address climate change. It involves limiting corporate emissions and allowing organizations to exchange carbon allocations.

ANSWER: **cap-and-trade** [or **CAT**; prompt on **emission trading** or **carbon credit** scheme; reject “carbon tax”]

[10h] In *This Changes Everything*, this Canadian author argues that climate change cannot be addressed by neoliberal capitalism. This writer also described how right-wing economic policies are opportunistically implemented during times of social upheaval in *The Shock Doctrine*.

ANSWER: Naomi **Klein**

<Benjamin Chapman, Social Science - Economics> ~20432~ <Editor: Athena Kern>

15. Indian *sadhus* imported as laborers may have influenced the natural treatment of this hairstyle in communities following *ital*. For 10 points each:

[10m] Name this hairstyle inspired by Nazirite vows. This hairstyle’s name may derive from Iyadic words used to indicate that it symbolized the Lion of Judah.

ANSWER: **dreadlocks** [accept **dreads**; accept **locks** or natty **locks** or natural **locks**; prompt on **long hair**]

[10e] Messianic Dreads name one of the Mansions of this Jamaican religion that opposes the “downpression” of Babylon.

ANSWER: **Rastafarianism** [accept the **Rastafari** movement; accept **Rasta**]

[10h] Dreadlocks are worn to these gatherings that involve smoking ganja and are sometimes named for the queen Nyabingi. A holy day that shares its name with these gatherings celebrates Haile Selassie’s 1966 visit to Jamaica.

ANSWER: **grounation** [accept **groundation**; accept **grounings** or **groundings**; accept **Grounation Day**]

<Veer Bhatt, RMP - Other Religion> ~20473~ <Editor: Athena Kern>

16. The temperance movement in this city took off after a member of the Jenks family refused to drink a glass of wine to celebrate her wedding. For 10 points each:

[10m] Name this city where the Declaration of Sentiments was signed during an 1848 event attended by Lucretia Mott.

ANSWER: **Seneca Falls** [prompt on **Seneca**]

[10h] This Seneca Falls native edited the temperance newspaper *The Lily*, in which she advocated the wearing of a “Turkish dress.”

ANSWER: Amelia **Bloomer** [or Amelia Jenks **Bloomer**; accept **bloomers**]

[10e] A 75th anniversary commemoration of the convention included a march from Seneca Falls to Rochester, where this woman was arrested for voting in 1872. The 19th Amendment is sometimes named for this woman, who appears on a dollar coin.

ANSWER: Susan B. **Anthony**

<Michael Bentley, History - American - 1865-1945> ~20422~ <Editor: Michael Bentley>

17. Critics of this play suggested that its plot was based on its author's marriage to Armande Béjart ("ar-MOND BAY-zhar"), the illegitimate daughter of his mistress. For 10 points each:

[10h] Name this play in which Arnolphe ("ar-NOLF") plans to marry his ward Agnès, who ends up falling for Horace ("oh-RASS") instead.

ANSWER: The School for Wives [or L'école des femmes]

[10m] The author of *The School for Wives* had earlier prompted threats of excommunication by writing this other play, in which Orgon ("or-GON") hosts the title religious fraudster.

ANSWER: Tartuffe ("tar-TOOF"), or *The Impostor*, or *The Hypocrite* [or Tartuffe, ou l'Imposteur]

[10e] This French playwright wrote *The School for Wives* and *Tartuffe*.

ANSWER: Molière ("mol-YAIR") [or Jean-Baptiste Poquelin]

<Halle Friedman, Literature - European - Drama> ~12579~ <Editor: Joseph Krol>

18. These structures were "discovered" by European modernists after Alma Mahler took photos of some on a tour of the US that were later published by Walter Gropius. For 10 points each:

[10h] Name these structures. Charles Demuth painted a concrete and steel example of one of these structures in Lancaster, Pennsylvania in his painting *My Egypt*.

ANSWER: grain silos [or grain elevators]

[10m] This architect included some of Mahler's photos of grain silos in his book *Towards a New Architecture*. This modernist advocated for the Radiant City.

ANSWER: Le Corbusier [or Charles-Édouard Jeanneret or Corbu]

[10e] Grain silos were a common subject in Constructivism, an art movement that flourished in this country.

The poster *Beat the Whites with the Red Wedge* supported this country's Bolshevik party.

ANSWER: Soviet Union [or USSR; or CCCP; accept Russia]

<Michael Bentley, Fine Arts - Miscellaneous> ~20509~ <Editor: Young Lee>

19. The Hougoumont Hotel in this city is named for the last convict ship to arrive in Australia. For 10 points each:

[10h] Name this state capital that grew rapidly following a gold discovery at Kalgoorlie ("kal-GOOR-lee"). This city was once the capital of the Swan River Colony.

ANSWER: Perth

[10e] British convict ships ceased operating with the closure of a convict station in this place. The Peace of Utrecht formalized British control of Minorca and this strategically important territory at the entrance to the Mediterranean.

ANSWER: Gibraltar [accept Rock of Gibraltar]

[10m] Many of the convicts on the *Hougoumont* had participated in the 1867 Fenian Rising, just like this city's "Martyrs" who were executed for bombing a police van. *The Guardian* was founded in this city following the Peterloo Massacre.

ANSWER: Manchester

<Michael Bentley, History - Cross, Historiography, and Miscellaneous> ~18178~ <Editor: Michael Bentley>

20. It's not the Caribbean, but over 200 divers have drowned while traversing the Arch in a Blue Hole in this body of water. For 10 points each:

[10e] Name this body of water where snorkelers explore the Sunken City artificial coral reef near Hurghada, an Egyptian port city south of the Sinai Peninsula.

ANSWER: **Red Sea**

[10h] The remains of the Umbria in this country's largest Red Sea port is a popular shipwreck diving spot. This country's Rapid Support Forces evolved from Abbara and Baggara militias in its west.

ANSWER: **Sudan** [or Republic of the **Sudan**; accept as-**Sūdān**]

[10m] Red Sea divers can spot these animals performing cultivation grazing on seagrass beds. Northern Australia is a hotspot for this marine animal and relative of the manatee.

ANSWER: **dugongs** [prompt on sea cows]

<Andrew McCowan, Geography - World> ~20265~ <Editor: Ganon Evans>

21. Answer the following about the inventions of Clément Ader, for 10 points each.

[10e] King Luis I of Portugal and Marcel Proust were both subscribers to an Ader invention that used this technology to allow people to listen to the opera. In the US, this technology was monopolized by AT&T.

ANSWER: **telephone** [or **telephony**; prompt on electricity]

[10m] Ader came up with numerous failed designs for innovations in this industry. The Smithsonian long recognized S. P. Langley's achievements in this industry over those of a family from Ohio.

ANSWER: **aviation** industry [or **airplane** industry or **air** industry; accept synonyms like **flight**] (The Ohio family was the Wright Brothers.)

[10h] Ader lends his name to a factory operated by this Toulouse-based aerospace conglomerate, formed from a merger of French, German, and Spanish aerospace and defense firms in the 1970s.

ANSWER: **Airbus** [or **Airbus** Industrie]

<Michael Bentley, History - Cross, Historiography, and Miscellaneous> ~20846~ <Editor: Michael Bentley>