

2022 Winter Closed

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Packet J

Tossups

1. **The effect of one form of this material on the moment of inertia of a pile of closely spaced parallel thin disks was studied by E. L. Andronikashvili. The dissolution of one form of this material into another form of it is the cooling mechanism in dilution refrigerators. David Lee, Douglas Osheroff, and Robert Richardson discovered a novel phase of one form of this material by cooling it with adiabatic compression. A parabolic minimum in the dispersion relation of one form of this material is occupied by quantum excitations likened to (\*) vortex rings. Second sound in one form of this material is explained by Lev Landau's two-fluid model. For one form of this material, a plot of heat capacity versus temperature displays a lambda transition between a normal phase and a superfluid phase. For 10 points, name this fluid material made of an inert element.**

ANSWER: liquid **helium** [or superfluid **helium** or (liquid) **helium II** ("two") liquid **helium-4** or liquid **helium-3** or superfluid **helium-3**] (The third sentence refers to the use of a Pomeranchuk cell to discover superfluid helium-3.)

<Parameswaran, Physics>

2. **In a poem in this language, a squire recovers a king's goblet from a whirlpool, but the king throws it back in the sea and the squire drowns looking for it. In another poem in this language, the title object is cast in a "form burnt out of clay" and christened *Concordia*. The poems "The Diver" and "The Song of the Bell" were written during a "year of the ballad" in this language. A poem in this language describes a figure "with (\*) crown and cape" who tempts a child with "pretty games." That poem begins, "Who's riding so late through the night and wind?" A poem in this language declares, "O friends, not these tones!" and calls its addressee a "bright spark of divinity" and "daughter of Elysium." For 10 points, the "Ode to Joy" was written in what language used by Friedrich Schiller and Johann Wolfgang von Goethe ("GURR-tuh")?**

ANSWER: **German** [or **Deutsch**] (The poem is "Der Erlkönig.")

<French, Poetry>

3. **Alistair Crombie argued that Robert Grosseteste's ("gross-test's") commentary on a book on this discipline was the earliest book in the Latin West to propose an experimental method for science. Parts of this discipline are classified as "*antiquorum*" and "*modernorum*," the latter of which includes the theory of supposition, in a book on it by Peter of Spain. Some of Aristotle's writings on this discipline were known to early medieval authors through translations by Boethius, whose translation of Porphyry's (\*) *Isagoge* ("ICE-ah-go-jee") became a standard textbook for it. It's not metaphysics, but the position that universals exist only in language or in the mind was defended in William of Ockham's "Summa" of this discipline. Grammar, rhetoric, and this discipline make up the Trivium. For 10 points, name this discipline, once taught using Aristotle's *Organon*, which studies syllogisms and inferences.**

ANSWER: **logic** [or **dialectic** or **logica**; accept *Summa **Logicae*** or *Sum of **Logic*** or *Sumulae **Logicales***]

<French, Philosophy>

4. The idea for a film titled for this character was “stolen from everybody” according to its screenwriter Dan O’ Bannon, who had earlier worked on the special effects for Alejandro Jodorowsky’s (“ho-do-ROF-skee’s”) never-realized adaptation of *Dune*. Bolaji Badejo’s (“bo-lah-jee bah-deh-joh’s”) only credited role was as this character, whom cinematographer Derek Vanlint depicted in a shot followed by a scream and a close-up of the ginger cat Jonesy. This character’s “purity... unclouded by conscience, remorse, or delusions of reality” is praised by (\*) Ash, who turns out to be an android. This character’s design was inspired by H. R. Giger’s (“GHEE-gher’s”) print *Necronom IV* (“four”). In an iconic shot aboard the *Nostramo*, this character viscerally emerges from Kane’s chest. For 10 points, Sigourney Weaver’s Ripley confronts what title xenomorph in a 1979 Ridley Scott film?

ANSWER: Alien [or Internecivus raptus; prompt on xenomorph]  
<Naveh-Benjamin, Other Arts>

5. *Description acceptable*. It is unclear how the *etak* technique for performing this task reconciled with legends of a vanishing object named Kaafiror. A 1987 book by Will Kyselka opens with an anecdote about how the observation that the sun had risen from an unexpected location inspired Nainoa Thompson to seek help in learning this task. David Henry Lewis assisted Mau Piailug (“pee-EYE-lug”) in spearheading a project for reviving interest in techniques for this task, for which the PVS (\*) constructed the *Hōkūle’a*. The Tahitian priest Tupaia used his knowledge of this task to aid Captain Cook. One technique for this task in which an outstretched palm against the night sky allows one to measure the angle between constellations and the horizon was used to populate places like the Marquesas Islands and New Zealand. For 10 points, name this task undertaken by Polynesians to explore the Pacific.

ANSWER: Polynesian navigation [or Polynesian wayfinding; accept mapmaking or mapping; accept descriptions of finding one’s way across the ocean; prompt on sailing or other forms of water-based transportation that do not mention navigation]  
<Lo, Other History>

6. In a novel inspired by this work, a woman falls ill after trying to imitate Madeleine de Scudéry’s *Clélie* (“clay-LEE”) by swimming the Thames and eventually marries her cousin Glanville. *Tristram Shandy* parodies this work in the tale of Hafen Slawkenbergius and in the description of Parson Yorick’s “sorry” conveyance. It’s not *Pamela*, but Henry Fielding’s novel *Joseph Andrews* is “written in imitation of the manner of” this work, which was recast from a woman’s viewpoint in a novel by Charlotte Lennox. This novel’s metafictional (\*) second part lambasts a fake sequel by Avellaneda (“ah-veh-yah-NEH-dah”). This novel’s author claimed to discover it as a manuscript written by the historian Cide Hamete Benengeli. The lost play *Cardenio* was inspired by this novel, whose protagonist is eventually bested by the Knight of the White Moon. For 10 points, name this novel about a windmill-tilting knight errant by Miguel de Cervantes.

ANSWER: Don Quixote [or The Ingenious Gentleman Don Quixote of La Mancha] (The Charlotte Lennox novel is *The Female Quixote*.)  
<R. Keyal, Long Fiction>

7. **The two most common screening tests applied to this substance consist of an anti-globin antibody assay and a strip of paper coated with guaiac (“gwai-ack”). A digital exam that turns up this substance after more than 48 hours may indicate a failure in neural crest cell migration in Hirschsprung disease. *Ascaris lumbricoides* infections are confirmed by subjecting this substance to an O&P exam. It’s not marrow, but this substance is (\*) “transplanted” to treat recurrent *C. difficile* infections. Senna, docusate, and lactulose modify the consistency of this substance. A tarry (“TAR-ee”) form of this substance known as melena may indicate an upper GI bleed. Passage of this substance, whose solid mass is roughly 30-percent bacteria, brings relief to people with IBS. For 10 points, name this substance that can be “softened” with laxatives.**

ANSWER: human **stool** [or **feces**; or **poop**; or equivalents; prompt on **fat** by asking “in which substance?”]

<Naveh-Benjamin, Biology>

8. **During a parade for this cause, newspapers championed the presence of a non-existent Native American named Dawn Mist. In support of this cause, “General Jones” marched from New York City to Albany. A critical legislative victory for this cause came thanks to the last minute votes of Harry T. Burn and Banks Turner. During the “Night of Terror,” supporters of this cause were imprisoned at Occoquan Workhouse, and their experience being (\*) force-fed through tubes was examined in the movie *Iron-Jawed Angels*. Supporters of this cause who held up banners referring to Woodrow Wilson as a “Kaiser” were known as the Silent Sentinels. After splitting with Carrie Catt over how to achieve this cause, Alice Paul founded a “national” party to fight for it and was inspired by the hunger strike tactics of the Pankhursts. For 10 points, what cause was achieved with the Nineteenth Amendment?**

ANSWER: **women’s suffrage** [or equivalents such as **women’s right to vote**; prompt on **suffrage** or **voting rights**]

<Parameswaran, American History>

9. **In a version of the Musaf (“MOO-sahf”) *Amidah* (“ah-mee-DA”), this object titles the set of prayers that follows *Malchuyot* (“mall-khoo-YOTE”) and *Zichronot* (“zeekh-ro-NOTE”). A poem whose title translates as “Today, the World was Conceived” is recited after using this object. The *Shulchan Aruch* (“shool-KHAN ah-ROOKH”) popularized using this object during Kaddish Shalem (“COD-ish shah-LAYM”) on one holiday to fulfill an obligation to use this object 100 times. The acronyms “Tashrat,” “Tashat,” and “Tarat” describe sequences that a *Ba’al Tokeah* (“BAH-all toh-KAY-ah”) may follow when using this object. To confuse (\*) Satan about the date of one holiday, this object is used every morning during the month of Elul (“eh-LOOL”), except on Shabbat. The material used to make this object recalls a creature whose appearance halts the sacrifice of Isaac. On the first day of Tishrei, this object generates “wake-up calls” to repent via the voices *tekiah* (“teh-kee-AH”), *shevarim* (“sh’var-EEM”), and *teruah* (“troo-AH”). For 10 points, name this ram’s horn blown on Rosh Hashanah.**

ANSWER: **shofar** [accept **Shofarot**; prompt on ram’s **horn** until read] (The acronyms are different permutations of *tekiah*, *shevarim*, and *teruah*.)

<Egol, Religion>

10. Dara Birnbaum edited and looped 1970s footage of this character in her video *Technology/Transformation*. Ghostwriter Joye Hummel's role in creating this character was revealed in a "secret history" by Jill Lepore that explores influences like Margaret Sanger's book *Woman and the New Race*. Robert Kanigher ("CAN-ig-er") rewrote this character after she was labeled a "morbid ideal" for her "homosexual connotation" in Frederic Wertham's (\*) *The Seduction of the Innocent*. Gloria Steinem helped repopularize this character by putting her on the first cover of *Ms.* magazine. Polygraph inventor William Moulton Marston drew on his interest in bondage and pin-up in creating this character, as seen in her Bracelets of Submission and Lasso of Truth. She was born on the island of Themyscira as the Amazonian warrior princess Diana. For 10 points, name this female DC comic book superhero.

ANSWER: **Wonder Woman** [accept **Diana** until read; accept *The Secret History of Wonder Woman*]  
<R. Keyal, Other Academic>

11. A Samuel Taylor Coleridge line about the "Holiest Thing Alive" graces a statue of this person funded by Great Depression miners in Ashland, Pennsylvania. An artist described a "slap in the face" to William Boxell after a painting of this person was bought by the Musée du Luxembourg. This person substituted for Maggie Graham after the latter skirted a portrait session. A framed print of the *Black Lion Wharf* and a floral curtain with its artist's signature (\*) butterfly monogram appear in the background of a painting of this person. A year after painting this person's portrait, its artist had Thomas Carlyle model for a similar composition. In an 1871 painting, this person has a stern look as she stares to the left and wears a black dress and white bonnet. For 10 points, name this family member who is the subject of the painting *Arrangement in Gray and Black No. 1*.

ANSWER: **Whistler's mother** [or **Anna McNeil Whistler**; prompt on Whistler; prompt on the artist's mother]  
<Evans, Painting and Sculpture>

12. This kingdom was the first to mint coins with a design of the cross, replacing a disc and crescent motif. According to legend, Christianization in this kingdom may have led Jewish communities to form the Kingdom of Simien. This kingdom invaded a nearby Jewish kingdom after Dhu Nuwas ("doo noo-WOSS") massacred the Christian population of Najran. Many churches and monasteries in this kingdom were burned down during a revolt led by (\*) Gudit. This kingdom's ruler Ezana was baptized by the missionary Frumentius. This kingdom constructed the Church of Our Lady Mary of Zion, which the later Solomonic Dynasty believed to contain the Ark of the Covenant. For 10 points, name this ancient Christian kingdom located primarily in modern-day northern Ethiopia.

ANSWER: Kingdom of **Aksum** [or **Aksumite Empire**; or **Axum**; reject "Ethiopia"]  
<Kulkarni, World History>

13. In a tale's frame story, an attendant tells of his time in this occupation to assuage the fears of his master, who bleakly responds "why give water to a goose at dawn who is to be killed in the afternoon?" A man with this occupation is enslaved and forced to climb a tree each day with a bow and arrow to hunt elephants. A character with this occupation meets a serpent who is actually the lord of Punt in an ancient Egyptian tale. A man recounts stories from his time in this occupation to a (\*) porter who shares his name, including when he blinded a Polyphemus-like, man-eating giant. That man with this occupation straps himself to a piece of meat to return from a valley of diamonds, where he had been carried by a giant bird called a roc. For 10 points, a story cycle in the *Arabian Nights* depicts the seven voyages of a man with what occupation named Sinbad?

ANSWER: sailor [or equivalents like mariner or seafarer; accept "The Tale of the Shipwrecked Sailor"; accept Sinbad the Sailor]

<Morrison, Misc. Literature>

14. A team led by professor Wang Zhonglin grew zinc oxide nanowires on this material in a proposed technology for scavenging body-movement energy. The current method of synthesizing this material was first used by Akzo Nobel to make Twaron ("TWAH-ron"). Spinning a liquid crystal solution of this material causes it to acquire a near uniform molecular orientation due to the shear applied by the spinneret. This aramid is formed from the condensation of 1,4-para-phenylenediamine ("1-4-para-phenyl-eeen-di-amine") and terephthalic ("tair-iff-THAL-ick") acid. This material, whose (\*) "29" and "49" types are commercially popular, was discovered by Stephanie Kwolek. This material with a tensile strength of nearly 3.5 gigapascals is remarkable because it has the heat-resistance of asbestos and the stiffness of glass. For 10 points, name this material trademarked by DuPont that is used in bulletproof vests.

ANSWER: Kevlar [or Kevlar 29 or K29 or Kevlar 49 or K49 or Kevlar KM2 or poly(p-phenylene terephthalamide) or poly(para-phenylene terephthalamide) or PPD-T]

<Settle, Chemistry>

15. In July 2022, this leader became the first to visit China since the Beijing Winter Olympics, where he negotiated an increase in palm oil exports. This leader has supported laws to weaken the anti-corruption agency KPK and re-instituted the death penalty shortly after his 2014 election. This leader has pushed forward infrastructure projects that had been delayed for decades, such as the Jatigede Dam and a Mass Rapid Transit system in the capital. This leader's practice of *blusukan*, or impromptu visits to constituents, began when he was mayor of Solo. This leader surprisingly brought his electoral rival (\*) Prabowo Subianto into his cabinet despite Prabowo's attempts to overturn the 2018 presidential election. In 2019, this leader announced an ambitious scheme to move his country's capital to Kalimantan, away from the overcrowded Jakarta. For 10 points, name this current president of Indonesia.

ANSWER: Joko Widodo [accept Jokowi]

<Raje, Current Events>

16. A town on Fisher’s Island only officially united with this city in 1709, despite the fact that Frederick II “Irontooth” had a royal residence in the town 300 years earlier. This city contained a tree-trunk bridge that was covered in spikes at night to discourage smugglers from passing a custom wall that was constructed in the 1730s to enforce an excise tax. Along with Milan, this city names an 1806 decree that was issued following the Battle of (\*) Jena-Auerstedt (“YAY-na OW-er-shtett”) and called for a blockade of the British Isles. In the same year, Napoleon looted a *quadriga* statue from a neoclassical monument in this city that consists of 12 Doric columns. In 1710, Frederick I officially declared this former capital of the Margraviate of Brandenburg as the seat of a new state led by the Hohenzollern dynasty. For 10 points, name this former capital of Prussia that today serves as Germany’s capital.

ANSWER: **Berlin** (The first clue refers to Cölln. The second clue refers to the Oberbaumbrücke.)

<Parameswaran, European History>

17. William Pietz’s work traces the origins of this term in colonial interactions and discusses examples like Akan (“uh-KON”) gold weights. Europeans used this term to identify power figures of the Kongo people, including *minkisi* with embedded nails. A type of this concept partly titles a book that studies Colombian sugarcane farmers and Bolivian tin miners who made satanic pacts; that Michael Taussig book is titled for “the Devil” and a type of this concept. This term comes from a word for (\*) witchcraft in Portuguese. According to Comte’s law of three stages, this term characterizes the first part of the theological stage. In *Das Kapital*, Marx coined a term using this anthropological concept to describe how value is ascribed to commodities instead of labor under capitalism. For 10 points, give this term that originally labeled the religious significance of objects in African societies and was later used to describe sexual attraction to inanimate objects.

ANSWER: **fetishes** [or **fetishism**; accept nail **fetishes**; accept commodity **fetishism**; accept *The Devil and Commodity Fetishism in South America*; prompt on **idols**; prompt on **commodity**]

<Yang, Social Science>

18. The “pop” variety of a chord built on this scale degree features an added ninth and eleventh above its root. The tension in one type of chord built on this scale degree derives from a tritone formed by the third and seventh above its root. It’s not the leading tone, but when a chord is built on this scale degree relative to any note other than the home key, it is a (\*) “secondary” chord named for this scale degree. Cadential six-four chords are always followed by root-position chords named for this scale degree since they share a common bass note. In sonata-allegro form, the exposition ends in the key denoted by this scale degree. Chords built on this scale degree resolve to the tonic in an authentic cadence. For 10 points, the scale degree of what number is known as the dominant?

ANSWER: **five** [or **fifth** scale degree; or **dominant** until read; accept pop **dominant** or secondary **dominant** or applied **dominant** or **dominant** seventh until “dominant” is read]

<Egol, Classical Music>

19. After doing this activity near a deserted lumber town, the protagonist of a story complains, “You know everything” during a break-up with his girlfriend Marjorie. In a two-part story about this activity, a man happily exclaims “Geezus Chrise” after burning his tongue on some beans and spaghetti. A man in a novel says that he is glad just to do this activity and not also to “kill the sun or the moon or the stars.” The protagonist traverses the burnt-over landscape of Seney, (\*) Michigan before catching grasshoppers and doing this activity in a story about Nick Adams set at a “Two-Hearted” location. A man who is called *salao* for spending 84 fruitless days doing this activity often dreams of lions on an African beach and idolizes the “great Joe DiMaggio.” For 10 points, what activity torments Santiago in the short novel *The Old Man and the Sea*? ANSWER: **fishing** [accept **trolling** or trout **fishing**; prompt on **hunting** or **camping**; prompt on **boating** or synonyms] (The stories are “The End of Something” and “Big Two-Hearted River.”)  
<R. Keyal, Short Fiction>

20. If this theorem holds, then it is preserved by smooth functions according to the usual statement of the delta method. The Brownian bridge arises when using a functional form of this theorem named for Donsker. A proof of this theorem writes a function “phi of  $t$ ” as “one minus a multiple of  $t$ -squared, plus a big-O term” all raised to the  $n$ , then applies Lévy’s continuity theorem about characteristic functions. The left-hand side of this theorem is often written as the square root of (\*)  $n$  times “theta-hat minus theta.” This theorem, which is typically said to kick in at around “ $n$  equals 30,” motivates the use of z-statistics when constructing confidence intervals. This theorem concerns convergence in distribution, unlike the similar law of large numbers. For 10 points, name this theorem which states that the rescaled sample mean of IID random variables tends to a normal distribution.  
ANSWER: **central limit** theorem [or **CLT**]  
<Morrison, Other Science>

## Bonuses

1. Chapter 18 of a novel consists mainly of the narrator describing this character's schedule in detail while urging him to get up from a parlor chair, in which he actually lies dead under mysterious circumstances. For 10 points each:  
[H] Name this villainous character who has his cousin falsely imprisoned for murder and, thirty years later, threatens to have him committed unless he reveals the location of a missing deed.

ANSWER: **Judge Pyncheon** [or **Jaffrey** Pyncheon; prompt on Pyncheon or the Judge]

[E] The cruel Judge Pyncheon appears in this author's novel *The House of the Seven Gables*, which, like his novel about Hester Prynne, draws on his Salem ancestry.

ANSWER: Nathaniel **Hawthorne** (The latter novel is *The Scarlet Letter*.)

[M] Hawthorne's preface labels *The House of the Seven Gables* a work in this genre that, unlike a novel, is not burdened by "a very minute fidelity." Hawthorne's time at Brook Farm inspired his novel about Miles Coverdale, which is titled for this genre.

ANSWER: **romance** [accept *The Blithedale Romance*]

<Morrison, Long Fiction>

2. The addition of hydrogen bromide to one of these molecules obeys Markovnikov's rule. For 10 points each:

[E] Name these unsaturated hydrocarbons with at least one carbon-carbon double bond.

ANSWER: **alkenes** [or **olefins**; reject "alkanes" or "alkynes"]

[H] In the presence of this type of compound, the addition of hydrogen bromide to alkenes is anti-Markovnikov. The efficiency of the decomposition of this type of compound is limited by the cage effect, which slows diffusive separation.

ANSWER: radical **initiator** [prompt on peroxides or hydrogen peroxide or H<sub>2</sub>O<sub>2</sub> by asking "what is the role of the peroxide in the reaction?"]

[M] This two-step reaction converts alkenes to anti-Markovnikov alcohols, unlike oxymercuration-demercuration. Alkyl boranes with steric ("STAIR-ick") hindrance enhance the regioselectivity ("REE-jee-oh-selectivity") of this reaction.

ANSWER: **hydroboration**-oxidation

<A. Keyal, Chemistry>

3. Ilmarinen receives poisons from serpents, spiders, and insects when he sends one creature to retrieve this substance for him so that he can produce steel from iron. For 10 points each:

[H] Name this substance. In another episode, a woman sends a creature to a magic island and then the seventh heaven to retrieve this substance so that she can restore both a physical body and its speech.

ANSWER: **honey** (The second clue refers to Lemminkäinen's mother restoring him to life.)

[M] As Ilmarinen and Väinämöinen both approach this figure's home to court her daughter, charmed logs flow with honey to indicate no danger. This ruler of Pohjola ("po-YO-la") locks up the Sampo and steals the Sun and Moon.

ANSWER: **Louhi** ("LOW-hee")

[E] It's not mead, but during wedding preparations for Ilmarinen an old man relates how this drink was first made with pine cones, bear spit, and honey in an early example of adding hops to brew this alcoholic drink.

ANSWER: **beer** [accept **ale**]

<Suh, Mythology>



4. *Note to moderator: You may censor the word in quotes.* Two reporters from this newspaper coined the word “ratfucking” to describe how CREEP carried out political sabotage through illegal means. For 10 points each:

[E] Carl Bernstein and Bob Woodward were two reporters for what newspaper that broke the Watergate scandal?

ANSWER: The Washington Post [accept WaPo; prompt on The Post]

[M] CREEP derailed Edmund Muskie’s campaign by forging a letter in which he expressed dislike for this country’s people. LBJ told this country’s prime minister “not to piss on my rug” during disagreements about the Vietnam War.

ANSWER: Canada [accept Canuck Letter] (The leader was Lester Pearson.)

[H] CREEP also faked a letter which claimed that this senator had an illegitimate child with a 17-year-old. This Democrat from Washington supported the use of force against Communist countries, a stance that influenced future neoconservatives.

ANSWER: Henry Martin “Scoop” Jackson

<Parameswaran, American History>

5. Answer the following about Switzerland’s legendary Montreux (“mon-TRUH”) Jazz Festival, for 10 points each.

[M] Deep Purple’s song “Smoke on the Water” references how the festival’s original setting, the Montreux Casino, burned down during a 1971 performance by this eccentric artist who released the album *Hot Rats* and led the Mothers of Invention.

ANSWER: Frank Zappa [or Frank Vincent Zappa]

[H] The pianist Oscar Peterson, who recorded a Grammy-winning live album at the 1977 festival, was from this city. The only international jazz festival larger than Montreux is held every summer in this city.

ANSWER: Montreal [accept the Montreal International Jazz Festival or Festival International de Jazz de Montréal]

[E] In the 1990s, Quincy Jones took over as director of the Montreux Jazz Festival. Jones had earlier produced this Michael Jackson album, whose title track has a music video featuring zombies.

ANSWER: Thriller

<Parameswaran, Other Arts>

6. The strict definition of this type of algorithm requires constant space complexity. For 10 points each:

[M] Name this type of algorithm that generates output by overwriting the input without using additional data structures.

ANSWER: in-place algorithms

[E] Reversing one of these data structures is commonly used to illustrate the difference between in-place and not-in-place algorithms. These data structures are contiguous segments of memory accessed with integer indices.

ANSWER: one-dimensional arrays

[H] An in-place algorithm for this task that is unbiased and linear in time was first described by Ronald Fisher and Frank Yates. A Spotify Engineering blog post discusses how dithering techniques inspired modifications to the Fisher–Yates algorithm for this task.

ANSWER: shuffling data [or shuffle data or randomizing a list or generating a random list or generating a random permutation; accept pseudorandom or apparently random or psychologically random in place of “random”; accept “How to Shuffle Songs”; prompt on permuting or generating a permutation or generating a list by asking “what property does the permutation/list have?”]

<Settle, Other Science>

7. Arthur Torres introduced the first legislation in the US designed to achieve this goal. For 10 points each:

[M] Name or describe this goal. John Banzhaf argues that the 1:1 ratio of fixtures in certain locations constitutes a form of sex discrimination that can be addressed by building codes designed to achieve this goal, which require 1:2 or 1:3 ratios instead.

ANSWER: **potty-parity** [or **equal access to toilets**; accept **restrooms** or **bathrooms** for toilets; accept descriptions like **eliminating wait times** for using the **restroom**; reject answers like “equal numbers of male and female restrooms”]

[H] Potty parity or lack thereof can be quantitatively measured by wait times for toilets, which are studied using this field’s multi-server and multi-class models. Agner Erlang is credited with introducing this mathematical discipline.

ANSWER: **queueing** theory [or **queuing** theory; or **queue** theory]

[E] One solution is to retain multi-person restrooms with both urinals and stalls, but convert them from men’s restrooms to these other kinds of restrooms, which have the added benefit of being safer for transgender people.

ANSWER: **gender-neutral** restrooms [or **all-gender** restrooms; or **unisex** toilets; or equivalents]

<Karim, Social Science>

8. Answer the following about Baroque music in Latin America, for 10 points each.

[E] This religious figure is the subject of *Hanaq pachap kusikuynin*, a Quechua-language hymn for four voices. Mexican composer Hernando Franco wrote two settings of “Salve regina,” a hymn dedicated to this woman.

ANSWER: the Virgin **Mary** [or **María**]

[M] A Jesuit composer with this first name and the last name Zipoli taught music to the Guaraní people. Although his real first name was Giuseppe, a composer who went by this first name wrote 555 keyboard sonatas and trained under his father Alessandro.

ANSWER: **Domenico** [accept **Domenico** Zipoli or **Domenico** Scarlatti]

[H] Zipoli’s only surviving piece of this type is in A major. Giuseppe Tartini credited a composition of this type to a dream in which the devil gave him a music lesson.

ANSWER: **violin sonata** [accept **sonata** for solo **violin**; accept **sonata** for **violin** and **continuo**; accept **Devil’s Trill Sonata**; prompt on **sonata**]

<Golden, Classical Music>

9. The struggles faced by Hortense Joseph and other members of the Windrush Generation in postwar London are chronicled in a 2004 novel titled for this kind of “Island.” For 10 points each:

[H] Give this adjective, which partly titles a nonfiction book that begins by defining a tourist as “an ugly, empty thing” and grapples with the effects of tourism and colonization on its author’s home country of Antigua.

ANSWER: **small** [accept **Small Island** or **A Small Place**]

[E] The title of Andrea Levy’s *Small Island* refers to this Caribbean nation, which the author of *A Small Place* and *Lucy* took as a pen name. Louise Bennett shunned literary tradition by writing in its creole language called Patois (“pah-TWAH”).

ANSWER: **Jamaica** (The author is Jamaica Kincaid.)

[M] The Small Axe Project, a publisher of Caribbean literature, takes its name from a proverb popularized by this man. Marlon James’s novel *A Brief History of Seven Killings* fictionalizes a 1976 assassination attempt on this man.

ANSWER: Bob **Marley** [or Robert Nesta **Marley**]

<R. Keyal, Misc. Literature>

10. In 1926, Juan Arellano (“ah-reh-YAH-no”) designed this country’s Legislative Building, which marked a shift away from Spanish-style architecture. For 10 points each:

[E] Name this Asian country colonized by the US after a war ended by the capture of Emilio Aguinaldo.

ANSWER: the **Philippines** [or Republic of the **Philippines**; or Republika ng **Pilipinas**]

[H] To escape the crowded Manila, the US ordered the creation of this hill station. This city planned by Daniel Burnham became the Philippines’ summer capital.

ANSWER: **Baguio** (“BAH-ghee-oh”)

[M] This Filipino politician headed a group sent to Washington to secure passage of the Tydings–McDuffie Act and became the first president of the Philippines under the new constitution in 1935.

ANSWER: Manuel **Quezon** (“KAY-son”)

<Raje, Other History>

11. A feud between two 18th-century *commedia dell’arte* playwrights with this first name pitted the socially conscious literary style of one against the improvisational, fairy-tale-inspired *fiabe* of the other. For 10 points each:

[H] Give this first name. Richard Bean’s *One Man, Two Guvnors* adapts a play by an author with this first name centering on the comic servant Truffaldino, whose insatiable hunger leads him to try to serve a second master.

ANSWER: **Carlo** [accept **Charles**; accept **Carlo** Gozzi or **Carlo** Goldoni] (That play is *The Servant of Two Masters*.)

[E] Carlo Gozzi (“GOT-see”) caricatured Carlo Goldoni as an idiotic magician in *The Love for Three Oranges*, which, like his play *Turandot*, is better known for being adapted into this genre.

ANSWER: **opera** [accept **libretto**]

[M] Goldoni imitated his idol Molière by also writing a play about this man, who first appeared in a Golden Age drama by Tirso de Molina.

ANSWER: Don **Juan** [accept Don **Giovanni**]

<R. Keyal, Drama>

12. Part of the 2018 Sakurai Prize was awarded to Ann Nelson who, along with Stephen Barr, developed a mechanism that could explain why this symmetry is preserved by the strong force. For 10 points each:

[M] Name this symmetry that must be broken for long-lived neutral kaons (“KAY-ons”) to decay to two pions (“PIE-ons”).

ANSWER: **CP** symmetry [or **charge conjugation parity** symmetry; reject “P symmetry” or “parity symmetry” or “C symmetry” or “charge conjugation symmetry”]

[E] *Two answers required*. The mass ratio of these two quarks is restricted by other solutions to the strong CP problem. These two first generation quarks make up protons and neutrons.

ANSWER: **up** quarks AND **down** quarks [accept **u** in place of “up quarks”; accept **d** in place of “down quarks”]

[H] This physicist shared a Sakurai Prize with an Italian colleague for a solution to the strong CP problem. That theory named for this physicist and her colleague introduces a U(1) (“U-one”) symmetry that, when broken, results in a Goldstone boson called the axion (“AX-ee-on”).

ANSWER: Helen **Quinn** [or Helen Rhoda Arnold **Quinn**; prompt on **Peccei–Quinn** theory or symmetry]

<Settle, Physics>

13. Roderic, a king of these people, died in battle against the Umayyads at the Battle of Guadalete. For 10 points each:

[M] Name these people who were forced to cede their capital city to the Umayyads not long after losing the battle. Pelayo, a different king of these people, is said to have initiated the *Reconquista* (“ray-kon-KEE-stah”).

ANSWER: **Visigoths** [prompt on **Goths**]

[H] The history of the Battle of Guadalete is recorded in the anonymous Chronicle of 754, which was also described with this word. This controversial term refers to Christians living in Al-Andalus, and it also names a style of ornate illuminated manuscript exemplified by Beatus’s “Commentary on the Apocalypse.”

ANSWER: **Mozarabic** [or **Mozarabs**]

[E] The Chronicle of 754 is a primary source for this other battle, during which Charles Martel’s troops prevented the Umayyads from conquering France.

ANSWER: Battle of **Tours** (“toor”)

<Parameswaran, European History>

14. Frédéric Le Marcis conducted fieldwork in a prison in Abidjan for a work comparing prison systems to this concept. For 10 points each:

[H] Name this concept introduced by the author of *On the Postcolony*, Achille Mbembe (“ah-SHEEL em-BEM-beh”). This concept is the power that gives the right to impose physical, social, or civil death on others.

ANSWER: **necropolitics**

[M] Necropolitics is often cited as an extension of this Foucauldian (“foo-KOH-dee-an”) concept by which political states can control large groups of humans, first introduced in *The History of Sexuality*.

ANSWER: **biopower** [accept **biopolitics**]

[E] Mbembe’s *On the Postcolony* examines historical power relations in this continent. Chinua Achebe criticized Joseph Conrad’s otherizing depiction of this continent in the essay “An Image of [this continent].”

ANSWER: **Africa** [accept “An Image of **Africa**: Racism in Conrad’s *Heart of Darkness*”]

<Kulkarni, Philosophy>

15. A bust of this man appears next to a woman wearing a blue turban in a portrait by George Caleb Bingham. For 10 points each:

[M] Name this man who was sculpted along with Samuel Kirkwood and Sequoyah by the self-taught artist Vinnie Ream for the US Capitol building. The Piccirilli (“PEE-chee-REE-lee”) Brothers helped a different artist create a statue of this man.

ANSWER: Abraham **Lincoln** (The second statue is by Daniel Chester French.)

[E] Late in her life, Vinnie Ream exhibited some of her sculptures in this city at the World’s Columbian Exposition.

ANSWER: **Chicago**

[H] This other sculptor was neighbors with Daniel Chester French when she created a memorial to the *Titanic* disaster in Washington, D.C. She later founded a namesake museum with the help of her secretary, Juliana Force.

ANSWER: Gertrude Vanderbilt **Whitney** [or Gertrude **Vanderbilt** Whitney] (She founded New York’s Whitney Museum.)

<Parameswaran, Painting and Sculpture>

16. Answer the following about Emilia Lanier's *Salve Deus Rex Judaeorum*, the first poetry collection published by an Englishwoman, for 10 points each.

[E] It contains an "Apology in Defense of Women" that claims this woman's only fault was "too much love." This woman hears the "Language of Man pronounced / By tongue of brute" as she is tempted by Satan in *Paradise Lost*.

ANSWER: **Eve** [accept "**Eve**'s Apology in Defense of Women"]

[H] The collection ends with "The Description of Cooke-Ham," a poem whose Edenic imagery about one of these places influenced Ben Jonson. A parodic song by Noël Coward popularized a Felicia Hemans ("HEM-inz") poem about these places "of England."

ANSWER: country **houses** [or **homes**; accept **manor** or **mansion**; accept country **house** poem; accept "The Stately **Homes** of England"]

[M] It includes a dream addressed to a Countess of Pembroke from this family who led the Wilton circle. Jonson's "To Penshurst" ("PENCE-hurst") lauds the estate of this family, which included the poet of the sonnet sequence *Astrophil and Stella*.

ANSWER: **Sidney** [accept Mary **Sidney** or Philip **Sidney**; accept Mary **Herbert**] (The poem is "The Author's Dreame to Ladie Marie.")

<R. Keyal, Poetry>

17. Along with optogenetic techniques, the hM3Dq subtype of this tool has been applied in AgRP neurons to demonstrate that their activation can lead to increased feeding. For 10 points each:

[H] Name this tool developed from muscarinic receptors, activated with CNO rather than acetylcholine to modulate cellular activity. Newer forms of this technology use salvinorin B to act on a modified kappa-opioid receptor.

ANSWER: **DREADDs** [or **Designer Receptors Exclusively Activated by Designer Drugs**; accept **KORDs** or kappa-opioid derived **DREADDs**]

[E] DREADDs are modified forms of these receptors, which have seven transmembrane domains and are regulated by GTP binding and hydrolysis.

ANSWER: **G-protein coupled receptors** [or **GPCRs**]

[M] Specific populations of cells can be targeted for DREADD expression using a combination of viral vectors and this recombinase, which acts at loxP sites to flox DNA.

ANSWER: **Cre** [accept **Cre**-LoxP]

<Yang, Biology>

18. A hereditary group of religious figures from this place practice divination using a set of objects referred to collectively as *mengdu*. For 10 points each:

[H] Name this place said to have 18,000 gods. During a harvest ritual from this place, its women divers and *timbang* celebrate the dragon king and the two-week stay of a goddess of the sea and wind.

ANSWER: **Jeju**-do [or **Cheju**-do; or **Jeju** Island; prompt on South **Korea**]

[E] Jeju Island is home to a unique branch of the Korean religious tradition named for these people. These community figures provide access to the spirit world in many animist religions.

ANSWER: **shamans** [or word forms; accept **mudang**, **baksu**, **tangol**, or **musogin**]

[M] Jeju shamans' *mengdu* consist of bronze disks, cups, a bell, and two of these brass objects that are thrown on the ground for divination. Some of these objects called *kris* are pointed at dancers' chests in ritual Balinese dances.

ANSWER: **knives** [or **knife**; or **kalsin-kal seonsaeng Siwang daecheonji**; or **gum**; accept **daggers** or **swords**]

<A. Keyal, Religion>

19. Answer the following about the daughters of daimyō Azai Nagamasa, for 10 points each.

[E] Azai had three daughters with Oichi, the sister of this warlord who defeated the Ikko-Ikki and became the first of Japan's three great unifiers.

ANSWER: **Oda** Nobunaga

[M] The oldest daughter, Yodo-dono, became the concubine of Toyotomi Hideyoshi and raised their son Hideyori in this castle. This castle, which shares its name with a modern city, was captured after a 1615 siege by the Tokugawa shogunate.

ANSWER: **Osaka** Castle [or **Ōsaka-jō**]

[H] The youngest daughter Oeyo ("oh-eh-yo") married this son and successor of Tokugawa Ieyasu ("ee-eh-yah-soo") who increased the persecution of Japanese Christians.

ANSWER: Tokugawa **Hidetada** [accept names in either order; prompt on **Tokugawa**]

<Raje, World History>

20. Answer the following about a *zettelkasten* ("zettle-cast-in"), for 10 points each.

[E] A *zettelkasten* is a note-taking system that usually involves these objects, which were used by Vladimir Nabokov to draft many of his novels. Invented by Carl Linnaeus, these objects are typically 3 inches by 5 inches in size.

ANSWER: **index cards** [prompt on **cards** or **notecards**]

[H] The enormous 90,000-card *zettelkasten* of this prolific German sociologist began to be digitized and published online in 2019. This advocate of systems theory debated Jürgen Habermas ("YUR-gun HAH-bur-moss").

ANSWER: Niklas **Luhmann**

[M] This French structuralist and literary theorist employed a *zettelkasten* to organize his ideas across disciplines. One of his index cards is pictured on the cover of the posthumous *Mourning Diary* about the death of his mother, a topic he also explored in *Camera Lucida*.

ANSWER: Roland **Barthes** ("bart")

<A. Keyal, Other Academic>