



**ACADEMIC
COMPETITION
FEDERATION**

2023 ACF NATIONALS

Finals 2

Packet By

The Editors (12)

Editors

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TOSSUPS

1. By heating with microwaves that are in resonance with this phenomenon, large ions like Ar⁸⁺ (“A-R-eight-plus”) were produced by SUPERMAFIOS, which legendarily caused a blackout in Grenoble. Adequate vertical focusing of this phenomenon can be achieved by using spiral magnet sectors with gaps between them to generate azimuthally varying fields. Particle motion is decomposed into this phenomenon and drift in the guiding center approximation. A superposition of this phenomenon, motion in the same plane, and an axial motion describe particles in a Penning trap. By the Larmor formula, the power radiated by this phenomenon is proportional to “the fourth power of charge, times velocity squared, times B-field squared, all over mass squared.” Two D-shaped electrodes are used to accelerate particles using this phenomenon. For 10 points, “q B over m” is the frequency of what circular motion of charged particles?

ANSWER: **cyclotron** motion [accept **cyclotron** radiation; accept isochronous **cyclotrons**; accept electron **cyclotron** resonance or ion **cyclotron** resonance; until “circular motion” is read, prompt on descriptions of a charged particle **circling** magnetic field lines or **orbiting** magnetic field lines; reject “synchrocyclotrons” or “synchrotron radiation”]
<Physics>

2. An essay by this author recounts a frustrated backgammon player throwing the board out the window and hitting a passerby, who understands the player’s frustration when he sees the reconstructed board position. This author called Shakespeare the “Proteus of human intellect” in an essay that argues that genius and taste are not reducible to rules. This author of “On Great and Little Things” and “On Genius and Common Sense” wrote that “greatness is great power, producing great effects” in an essay that expresses awe at rope-dancers and other mechanical performers, titled “The Indian Jugglers.” This author wrote a collection of 25 “contemporary portraits” of major figures from his time, including Samuel Taylor Coleridge and Charles Lamb. For 10 points, name this early 19th-century English essayist who wrote *Table-Talk* and *The Spirit of the Age*.

ANSWER: William **Hazlitt**
<British Literature>

3. The slogan that a related concept involves “the appearance of” this property is presented in a Stephen Yablo paper that discusses an “establish’d maxim in metaphysics” given by David Hume. Quine argued against a type of entity named for this property by imagining a fat man and a bald man, both with this property, in the same doorway. Alvin Plantinga’s version of the ontological argument uses the premise that this property applies to the proposition “there is a being that has maximal greatness.” In the most common interpretation, this property is represented by the diamond operator introduced by C. I. Lewis. A paper asking whether conceivability entails this property was written by David Chalmers, who argued that philosophical zombies have the “logical” type of this property. For 10 points, in modal logic, formulas are true or false relative to what type of “world”?

ANSWER: **possibility** [or **possible**; or **possibly**; accept **possible** worlds; accept logical **possibility**; accept **possibilia**; accept **possible** objects; accept **possible** entities]
<Philosophy>

4. 78 CE is Year Zero in these people’s namesake calendar, which is used on the Filipino Laguna copperplate inscription and is now the Indian national calendar. Per a lost play, a king of these people was killed by a prince who entered their camp disguised as Queen Dhruvadevi. The name of Gautama Buddha’s clan only differs from these non-Greek people’s Sanskrit name by a “y” sound, inspiring Christopher Beckwith’s theory that the Buddha was one of them. These people’s Western Satraps ruled Northwest India until their king Rudrasimha was defeated by the Gupta emperor Chandragupta II. Centuries before these people’s Eastern branch was pushed south into India by the Yuèzhī (“y’wey-zhuh”), members of their Western branch evaded an expedition led by Darius I and buried ornate “animal-style” jewelry in kurgans. For 10 points, name this nomadic Iranian ethnic group of the Eurasian steppes. ANSWER: **Scythians** [or Indo-**Sakas**; or **Shakas**; or Indo-**Scythians**; or **Sacae**, or **Sai**; accept **Śaka** calendar; prompt on Indo-**Iranians**]
<Other History>

5. *Description acceptable.* Stefan Thomke’s extensive research on people performing this job connects a misleading statistic about them to a 1999 Six Sigma certification by Forbes. A code similar to RFID developed for this job appears in a Hub and Spoke system with a central number representing a destination train station like Churchgate. In one city, the majority of performers of this job are still members of the Warkari (“var-kar-ee”) movement from Pune (“POO-nuh”) who would travel to the Ballard Pier for work. A man with this job relays letters between a widowed accountant and a lonely wife in a 2013 film directed by Ritesh Batra. People with this job have a uniform consisting of a white kurta and topi. People with this job travel to Nariman Point or Colaba via train or bicycle before returning boxes to customers’ homes. For 10 points, Mumbai’s dabbawalas (“duh-BAH-wah-luhz”) perform what job that involves carrying tiffin boxes? ANSWER: **food delivery** [or word forms such as **delivering food**; accept **meals** or **lunch** in place of “food”; accept lunch **dabbawalas** or **tiffin wallahs** until “dabbawalas” is read; prompt on **delivery** or synonyms by asking “of what?”; reject “grocery delivery”] (The film is *The Lunchbox*.)
<Geography>

6. A document backing this cause included the “farmers’ paragraph,” which required two-thirds of representatives to be from rural districts. This cause succeeded after a decade-long foreign policy debate over who would appoint diplomatic consuls. Advocates of this cause argued for the removal of the so-called “herring salad” mark from a flag. Supporters of this cause rioted at the “Battle of the Square” in support of an agreement signed a decade before at Eidsvoll, which had prompted a war ended by the Convention of Moss. Advocates of this cause essentially undid the Treaty of Kiel by agreeing to a settlement between Oscar II and members of the Storting. The success of this cause allowed for the replacement of compulsory control by the House of Bernadotte with rule by Haakon VII. For 10 points, what cause’s ultimate success in 1905 led to a dissolved union with Sweden and self-rule from Kristiania? ANSWER: **independence** of **Norway** [or **secession** of **Norway** from Sweden; accept **Norwegian independence** from Sweden; accept descriptions of Sweden and **Norway disuniting**; accept **Norge**, **Noreg**, **Norgga**, or **Vuona** in place of “Norway”; prompt on **independence** or **secession** or equivalents by asking “of which country?”]
<European History>

7. While drunk on rum, this character writes a quatrain that ends “Anything can happen in this life / but thou, do not forget me!” This character coos “Give me a kiss, sweetie!” to a “Faublas” whose papers he earlier stole from a clerk’s office. This character “[destroys] all the triumph and glory” and makes it impossible for a man to catch a cab in his nightmares. A man claims he is “putting my own head into [this character’s] thievish noose” after a debate with the drunken servant Petrushka over whom to call “master.” The protagonist first sees this character near a canal after being escorted out of Klara’s birthday party. This title character taunts a man as he is loaded into a German doctor’s carriage bound for an asylum at the end of an 1846 novella often published together with *The Gambler*. For 10 points, Golyadkin has a mental breakdown after seeing what title Dostoyevsky character with a similar appearance?

ANSWER: the **double** [accept the **Doppelgänger**; accept the **Other**; accept Golyadkin’s **double**; accept **Golyadkin Jr.** until “Golyadkin” is read; prompt on Yakov Petrovich or Golyadkin until “Golyadkin” is read by asking “he is nicknamed for what distinctive trait?”]

<European Literature>

8. A moto-perpetuo ostinato in the cello begins Jérôme Ducros’s piece titled for this practice for cello and piano. In 1786, Emperor Joseph II banned this practice at performances of *The Marriage of Figaro*. Arturo Toscanini was challenged to a duel after refusing to allow this practice at a performance and officially banned it at La Scala in 1921. Emanuel Ax pioneered pairing slow movements of cello sonatas for this practice alongside Brahms’s second piano concerto. Michiura Oshima’s *Memories* and Mason Bates’s *Ford’s Farm* are among 27 pieces commissioned for this practice and recorded in an album by Hilary Hahn. A greeting is traditionally shouted before the second of three pieces used for this practice at the Vienna New Year’s Concert, which is always Johann Strauss’s waltz *The Blue Danube*. For 10 points, name this practice in which a piece is played unannounced after the printed program.

ANSWER: **encores** [accept **Encore** for *Cello and Piano*]

<Classical Music>

9. This compound is the nonpolar half of the amphiphathic copolymer that stabilizes membrane proteins in lipid nanodiscs. This monomer strengthens the most common class of thermoplastic elastomers, which are named for it. Sulfonated polymers of this compound make up ion exchange resins. A bead made from a polymer of this compound is the “solid phase” used in peptide synthesis. Emulsion polymerizations were invented to stop runaway reactions of this aromatic compound during industrial rubber production. This compound is the heaviest monomer in a filament used for high-temperature 3D printing that also contains acrylonitrile and butadiene. This compound, which is a vinyl group attached to benzene, is the monomer of the very common plastic insulator used in isobaric calorimeters. For 10 points, name this compound that is polymerized into lightweight packaging and a commercial “foam.”

ANSWER: **styrene** [accept polystyrene or **PS**; accept **vinylbenzene** or **phenylethylene** or **phenylethene** until “vinyl” is read and prompt on it afterwards; prompt on Styrofoam]

<Chemistry>

10. *Original-language term required.* A meditation mantra promoted by Thích Nhất Hạnh analogizes this concept to the mud in which a lotus may grow. A *sutta* titled for this concept opens by stating that its three types are caused by changes, formations, and a form of this concept that is intuitively detected. The First Sermon equates this concept to the five bundles of “grasping fuel.” According to a passage in the *Dhammapada*, one becomes “weary of” this concept after realizing all conditioned phenomena are non-self or *anattā*, are impermanent or *anicca*, and are this concept. The second noble truth teaches that *samudaya* and this concept cause *taṇhā*, or craving, while the first noble truth states that this thing is characteristic of life in *saṃsāra*. For 10 points, in Buddhist thought, all existence is characterized by what concept that is often translated as “pain” or “suffering”?

ANSWER: **dukkha** [or **duhkha**; accept **Dukkha Sutta**]

<Religion>

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11. During this decade, the captain of an oil tanker named after a former Miss World winner anchored in the middle of a busy shipping lane to support striking workers and businessman Guaicaipuro Lameda Montero. During this decade, the principles of *sumak kawsay* were enshrined into the first constitution to codify rights of nature. Starting during this decade, loaned Cuban medical staff operated healthcare centers as part of the *Barrio Adentro* mission. At the start of this decade, the hyperinflated sucre was replaced by the U.S. dollar as legal tender in Ecuador. The Bolivarian Missions were conceived during this decade by a leader who, a decade before, quipped that his coup had failed “for now.” Left-wing leaders like Rafael Correa took office during this decade as part of a “pink tide” across South America. For 10 points, name this decade entirely spanned by the Venezuelan presidency of Hugo Chávez. ANSWER: **2000s** [prompt on ‘00s or aughts or noughties] (Captain Daniel Alfaró anchored the Pilín León at the entrance to Lake Maracaibo. Lameda Montero was ousted as head of Petróleos de Venezuela.) <World History>

12. This protein serves as a carrier for AIM in the blood to protect it from renal excretion, and it unbinds AIM to activate AIM’s apoptotic clearance function. Overproduction of this protein associated with *AID* results in susceptibility to encapsulated bacteria, while *Pneumocystis* and *Cryptosporidium* infections in the first year of life signal an X-linked *CD40L*-associated overproduction of it. Unlike a smaller counterpart, this protein’s polymerization does not depend strongly on the presence of the J-chain. This protein’s bound conformation is C1q’s most efficient binding partner to trigger opsonization in the classical complement pathway. This protein is the larger of the two expressed by naive B cells before class-switching, and its high avidity makes it useful for responding to multivalent antigens. For 10 points, the first antibody to respond to an antigen challenge is what pentameric isotype? ANSWER: **IgM** [or **immunoglobulin M**; accept (X-linked-) hyper**immunoglobulin M** syndrome or hyper-**IgM** syndrome; prompt on **antibody** or **antibodies**; prompt on **immunoglobulin** or **Ig**] <Biology>

13. This thinker emphasized the importance of the “relaxed field” of play in a book that draws on Merlin Donald to analyze the evolution of the title phenomenon since the Paleolithic. This author wrote an essay declaring the Vietnam War the “Third Time of Trial” after the sacrificial death of the Civil War and the Exodus narrative of the Revolution. This thinker was the lead author of a book that quotes a nurse who imagines herself as Christ and advocates “just trying to love yourself” in defining her “own Sheilaism.” In a 1967 *Daedalus* essay, this lead author of *Habits of the Heart* discussed the invocation of a generic God in John F. Kennedy’s inaugural address and discussed Memorial Day as part of a sacred calendar. For 10 points, name this sociologist of religion who wrote about reverence for national symbols like the words of the founding fathers in his essay “Civil Religion in America.” ANSWER: Robert **Bellah** [or Robert Neelly **Bellah**] (The first sentence is about *Religion in Human Evolution*.) <Social Science>

14. Samuel Noah Kramer’s discredited theory connecting this deity to a Greek analog hinges on a poem in which this deity is kidnapped by a boulder-throwing monster and pursued by a water god in a boat. This deity’s first spouse, whose name means “inspector of canals,” is mentioned in a lie told to the gatekeeper Bitu. In a poem from the Sultantepe tablet, this deity agrees to marry a spouse after being dragged from a throne and threatened with an ax, despite earlier having had sex with that attacker for six days straight. This deity presided over a ceremony in which seven Annunaki gave a “look of death” to another deity whose corpse is then hung from a stake. Either this goddess or her younger sister who disrobes upon entering the seven gates to her realm is depicted on the “Queen of the Night” relief. For 10 points, name this wife of Nergal, sister of Inanna, and Sumerian goddess of the underworld. ANSWER: **Ereshkigal** [or **Irkalla**] (The supposed Greek analog is Persephone.) <Mythology>

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15. Feminist historians Rosalind Rosenberg and Alice Kessler-Harris testified on opposite sides of a lengthy case brought against this company by the Equal Employment Opportunity Commission. An executive of this company was the first chair of the War Production Board. Aaron Nusbaum was ousted from his stake in this company by his brother-in-law, who later created a namesake “Fund” to posthumously honor the work of Booker T. Washington. This company titled men “assistant buyers” and women “buyer’s assistants” so that they could pay women less. The “Send No Money” campaign devised by this company had to be halted by Julius Rosenwald after demand outpaced the supply of sewing machines. Until 1998, this company’s headquarters was in the world’s tallest building. For 10 points, the original “consumer’s bible” was a mail-order catalog issued by what department store chain?

ANSWER: **Sears** [or **Sears**, Roebuck and Co.; accept **Sears** Catalog; accept **Sears** Tower; accept *EEOC v. Sears, Roebuck & Co.*] (Donald Nelson chaired the War Production Board.)

<American History>

16. In *Form Follows Libido*, Sylvia Lavin posits that one of this architect’s buildings was designed for users of orgone boxes as well as a painting studio for Robert Chuey. The logo for Shake Shack uses a sans-serif typeface named for this architect that is often derided as the “gentrification font.” Characters in Mike Mills’s film *Beginners* live in a house designed by this “biorealist” whose stairwell incorporates parts from a Ford Model A. This architect moved into a house on Kings Road before falling out with his countryman Rudolph Schindler. A hillside house designed in the International Style by this architect might be the first steel-framed building in the US. This architect built a Desert House in Palm Springs for future Frank Lloyd Wright patron Edgar Kaufmann. For 10 points, name this Austrian-American architect of the Lovell Health House and other modernist buildings in Southern California.

ANSWER: Richard **Neutra** [or Richard Joseph **Neutra**; accept **Neutraface**]

<Other Fine Arts>

17. An archive in this town houses a chocolate wrapper scrawled with the lines “necessitates celerity / were better / nay were immemorial.” Along with “hills, sir, and the sundown,” a Newfoundland dog from this town named Carlo was listed as a “companion” in letters sometimes signed “Your Gnome.” Residents of this town occasionally received flower baskets from a gardener along with verses like “to be a Flower, is profound Responsibility.” *Open Me Carefully* collects the seemingly erotic correspondence of two residents of this town, which was the birthplace of Helen Hunt Jackson. The line “Diadems—drop—and Doges—surrender—” was written by a poet from this town whose many slant rhymes include “perches in the soul” and “never stops at all.” For 10 points, what Massachusetts town was the home of Emily Dickinson, who was known as its “Belle”?

ANSWER: **Amherst**, Massachusetts [accept the “Belle of **Amherst**”] (Dickinson corresponded with Susan Huntington.)

<American Literature>

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18. Vlastimil Pták introduced a modified form of this property after noting how the open mapping theorem of functional analysis critically relies on this property of the spaces to conclude that the image of the unit ball under a continuous linear operator contains a ball centered at the origin. Spaces that are metrizable, locally convex, and have this property are named for Maurice Fréchet (“FREH-shay”). A non-empty space with this property cannot be expressed as a countable union of nowhere dense subsets. A theorem due to Stefan Banach (“BAH-nokh”) states that a contraction mapping on a space with this property has a unique fixed point. Any metric space can be expanded to have this property by constructing a space whose elements are equivalence classes of sequences. Extending the rationals to a space with this property gives the reals. For 10 points, name this property that means every Cauchy (“KOH-shee”) sequence converges.

ANSWER: **completeness** [or Cauchy **completeness**; or **complete** spaces; accept **completion** of a metric space or **completing** a metric space; accept **Cauchy** spaces until read; accept **B-completeness**; prompt on **Banach** spaces or **second category** spaces until “Maurice Fréchet” is read] (The result about non-empty complete spaces is a consequence of the Baire category theorem.)

<Other Science>

19. This character concludes that it would have been better if a black butterfly in his house had been born blue after he regrets killing it with a towel. A conversation between this character and his lover is composed solely of punctuation in the chapter “The Old Dialogue Between Adam and Eve.” When this character is astonished to encounter an old schoolmate who is now a beggar, the schoolmate steals his watch during an embrace. This character’s father sends him to university in Portugal for stealing money to buy his girlfriend jewelry. This character obsesses over creating a poultice to alleviate melancholy. A friend introduces the philosophy of Humanism to this lover of Virgilia, who dedicates a book “to the worm who gnawed the cold flesh of my corpse” and befriends Quincas Borba. For 10 points, name this protagonist of some “Posthumous Memoirs” by Machado de Assis.

ANSWER: **Brás** Cubas [or Brás **Cubas**; accept *The Posthumous Memoirs of Brás Cubas* or *Memórias Póstumas de Brás Cubas*]

<World Literature>

20. An artwork in this form by Massimiliano Soldani depicts a Florentine ship and the marine biologist Francesco Redi. In a work in this form, a ruler appears on horseback viewed from behind and in profile in a pose similar to its artist’s *Vision of Saint Eustace*. Four works in this form that depict guild implements appear below the main terracotta scene in Andrea Della Robbia’s *Madonna of the Stonemasons*. Posthumous portraits in this form decorating graves make up the best-known output of Auguste Préault (“ow-GOOST pray-OH”). Renaissance artworks in this form, which evolved from older bracteates, were pioneered by Pisanello, who cast one depicting John VIII Palaeologus. Daniel Chester French created one of these artworks depicting Benjamin Franklin on its obverse and a printer on its reverse. For 10 points, what typically round artworks that honor prominent individuals are today used as military decorations?

ANSWER: **medals** [or **medallions**; prompt on **prizes** or **awards**; prompt on **jewelry** or fraternal **jewels**]

<Painting & Sculpture>

BONUSES

1. Chola examples of these artworks were sometimes given the likeness of the wealthy people or rulers who commissioned them. For 10 points each:

[10e] Give this term that refers to ceremonial images of Hindu deities that are often decorated with jewels and flowers when on procession.

ANSWER: **mūrti** [or **idols**]

[10h] Many medieval murti stand in this curved pose, whose sculptural prominence in India is similar to that of *contrapposto* in Western art. In this pose, the subject curves one way at the knees and shoulders and the opposite way at the hips.

ANSWER: **tribhaṅga** [or **tribunga**; prompt on Odissi by asking “what is that pose called in a sculptural context?”]

[10m] The tribhaṅga can be traced back to this artwork from Mohenjo-daro with a distinctly curved posture. This sculpture shows its slender subject with one hand on her hip and the other adorned with many bangles.

ANSWER: ***Dancing Girl*** of Mohenjo-daro

<Painting & Sculpture>

2. The production-side analog of this value equals the slope of an isoquant. For 10 points each:

[10m] Name this value that represents the quantity of a good that a consumer is willing to give up for some amount of another good at the same level of utility.

ANSWER: **marginal rate of substitution** [or **MRS**; prompt on rate of substitution]

[10e] The marginal rate of substitution is the slope of one of these curves. A consumer has no preference between bundles of goods represented by points on these curves.

ANSWER: **indifference** curves

[10h] Connecting the tangent points where isoquants and isocost lines meet produces this curve, which is linear for homothetic production functions. Its consumption-side analog is the income-consumption curve.

ANSWER: **expansion path** [or **scale line**]

<Social Science>

3. A Stoic in this book who remains calm during a severe storm owns a copy of the now-lost fifth book of Epictetus’s *Discourses*. For 10 points each:

[10h] Name this 20-book miscellany that Aulus Gellius began writing over a long winter near Athens. This work contains important fragments of early Roman authors, such as the historian Claudius Quadrigarius.

ANSWER: ***Attic Nights*** [or ***Noctes Atticae***]

[10m] *Attic Nights* contains a unique comparison between Caecilius Statius’s *Plocium* and its original by this Greek playwright. In another play by this writer, Knemon has a change of heart after Sostratos saves him from a well.

ANSWER: **Menander** [or **Menandros**] (The unnamed play is *Dyskolos*.)

[10e] *Attic Nights* contains the earliest extant version of a story later popularized by Aesop about Androcles, who befriends one of these animals after removing a painful thorn from its paw.

ANSWER: **lions** [accept “Androcles and the **Lion**”; prompt on big cats or felines or felids]

<European Literature>

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4. Cyrus Faryar recites poems centered around this thing in a Mort Garson album subtitled “Cosmic Sounds.” For 10 points each:

[10h] Name this thing that follows “soul” in the title of a 1972 album by Rick Holmes and the Nat Adderley Sextet. The pianist Mary Lou Williams fused jazz and classical music in a suite named for this thing.

ANSWER: the **zodiac** [accept **Zodiac Suite**; accept **Soul Zodiac**; accept **The Zodiac: Cosmic Sounds**]

[10e] Another concept album centered around the zodiac was recorded by Barney Wilen, a saxophone player from this country where the three-fingered guitarist Django Reinhardt founded a “hot club.”

ANSWER: **France** [or **French Republic**; or République **française**]

[10m] A trio named for this musician recorded the astrology-inspired track “Horoscope.” Steely Dan’s song “Rikki Don’t Lose That Number” took its opening riff from this hard bop pioneer’s “Song for My Father.”

ANSWER: Horace **Silver** [or Horace Ward Martin Tavares **Silver**]

<Other Fine Arts>

5. The *Kitáb-i-Aqdas* states that this occasion is meant to encourage social cohesion that “bind[s] hearts together,” since attendance by all social classes is obligatory. For 10 points each:

[10h] Name this gathering held on the first day of the month in Bahá’í tradition. Though it was originally initiated by the Báb, it was formally institutionalized by ‘Abdu’l-Bahá’.

ANSWER: **Nineteen-Day Feast** [or **19-Day Feast**; prompt on “the **Feast**”]

[10m] The consultative portion of the Nineteen-Day Feast was called “an arena of democracy at the very root of society” in an encyclical from this institution. This nine-member ruling body of the Bahá’í Faith meets in Haifa.

ANSWER: **Universal House of Justice** [or **Bayt al-Adl al-Azam**]

[10e] Musical performances at Nineteen-Day Feasts draw from local genres; in the US they primarily feature performances of this style of African-American worship music sung by Sister Rosetta Tharpe and Mahalia Jackson.

ANSWER: **gospel** music [or Black **gospel** or African-American **gospel**; prompt on **Christian** music]

<Religion>

6. Andrew Furuseth led a pair of unions geared towards these people, who could be imprisoned for leaving their workplace until 1890s reforms. For 10 points each:

[10m] Name these people whose rights were addressed in the Maguire Act and the White Act. In a wave of “crimping” in the late 19th century, residents of West Coast cities were kidnapped to be sold into work as these people.

ANSWER: **sailors** [or **seamen**, **mariners**, **boatmen**, or **marines**; accept **Sailors’ Union of the Pacific**; accept International **Seamen’s Union**]

[10e] An alternate term for crimping uses the name of this Chinese city as a verb. American and British enclaves merged to form an “international settlement” in this largest of the treaty ports.

ANSWER: **Shànghǎi** [accept **shanghaiing**; prompt on the **Bund** or **Wàitān**]

[10h] Two of the most notorious crimpers shared this surname and were nicknamed “Bunko” and “Shanghai,” respectively.

ANSWER: **Kelly** [accept Joseph **Kelly** or “Bunko” **Kelly**; accept James **Kelly** or “Shanghai” **Kelly**]

<American History>

7. Using this metal as a charge carrier avoids both cross-contamination and electrodeposition because it has four stable oxidation states: plus-two, plus-three, plus-four, and plus-five. For 10 points each:

[10h] Name this transition metal used as the charge carrier in the most common redox flow battery for electric grids.

ANSWER: **vanadium** [or **V**]

[10m] To balance charge between the pipes, redox flow batteries rely on one of these semipermeable barriers made of Nafion. They also separate the compartments of fuel cells.

ANSWER: **proton-exchange membranes** [or **PEMs**; or polymer-**electrolyte membranes**; prompt on **membranes** or ion-exchange **membranes**]

[10e] The electrolyte of a vanadium redox flow battery is a solution of this compound. This “acid” in a lead-acid battery is prepared using a vanadium catalyst in the contact process.

ANSWER: **sulfuric acid** [or **H2SO4**]

<Chemistry>

8. This book’s description of the 1884 Berlin Conference claims it was “effected through the sword and the bullet,” “followed by the morning of the chalk and the blackboard.” For 10 points each:

[10h] Name this book that theorizes three aspects of “language as communication,” which are “the language of real life,” “communication in production,” and “the written signs.”

ANSWER: **Decolonising the Mind** [or **Decolonising the Mind: the Politics of Language in African Literature**]

[10m] In a book titled for this action, *Decolonising the Mind* inspires its author to “be cool and decolonized.” A Binyavanga Wainaina essay titled for this action ends with a reminder about “saying something about rainbows or renaissances.”

ANSWER: **writing** [or word forms of **write**; accept “How to **Write** About Africa”; accept *One Day I Will **Write** About This Place*]

[10e] *One Day I Will Write About This Place* recalls Wainaina’s experience with this native language of his, which Ngũgĩ justifies using in *Decolonising the Mind*.

ANSWER: **Gikuyu** [or **Kikuyu**]

<World Literature>

9. During the physical design stage of VLSI, a buffered H-tree is planned so that this signal is delivered to chip components with minimal skew. For 10 points each:

[10m] Name this signal whose frequency is directly proportional to the dynamic power consumed by a CPU.

ANSWER: **clock** signal

[10h] This communication paradigm moves beyond clock trees when they consume too much power or become overly complex. This paradigm, a form of globally asynchronous, locally synchronous design, replaces traditional buses and crossbars with some packet-switched topology.

ANSWER: **network-on-chip** [or **NoC** or **network-on-a-chip**; or **on chip networks**; reject “system on a chip”]

[10e] Networks-on-chip were designed in response to the amount of these devices on chips increasing, while clock frequency has plateaued. The number of these devices on a microchip doubles every two years per Moore’s law.

ANSWER: **transistors** [accept any type of **transistor**; prompt on **semiconductor** devices]

<Other Science>

10. After his death, a letter written by this ruler to Lord Aberdeen instructed that his eldest son Hilāl be disinherited in favor of his son Khālid. For 10 points each:

[10h] Name this ruler who signed a treaty with Fairfax Moresby to curtail the slave trade in the Indian Ocean and allowed Atkins Hamerton to become the first British consul to Zanzibar.

ANSWER: **Sa'īd bin Sulṭān** [or **Sa'īd bin Sulṭān** al-Bu'saidi; or **Saīd bin Sultani**; prompt on Sultan **Sa'īd** or **al-Bu'saidi**; prompt on, BUT DO NOT REVEAL, the "**Lion of Oman**"]

[10e] Sa'īd bin Sulṭān expanded the reach of this Arabian sultanate down the East African coast. In the 1970s, the territories of Muscat unified with this sultanate to create a modern-day state.

ANSWER: Sultanate of **Oman** [or Salṭanat '**Umān**]

[10m] In the 1830s, Sa'īd moved his capital to this settlement to take advantage of lucrative local spice production. Tippu Tip ran a segment of the East African slave trade out of this settlement on the island of Zanzibar.

ANSWER: **Stone Town** [or **Mji Mkongwe**; prompt on **Old Town**]

<World History>

11. Surface tension drives some forms of this phenomenon that initiate at the interface of two fluids. For 10 points each:

[10m] Name this phenomenon in which perturbative solutions have negative imaginary frequencies, causing the system to be forced out of equilibrium as the perturbations grow exponentially.

ANSWER: fluid **instability** [or fluid **instabilities**; accept **unstable** or **not stable**]

[10h] Surface tension drives this instability that is sometimes named for a Belgian physicist who observed it by exciting a liquid thread using a cello. Inkjet printers induce this instability in the inkjet stream to create a regular stream of small droplets.

ANSWER: Plateau-**Rayleigh** instability [or **Rayleigh**-Plateau instability or **Rayleigh** instability; prompt on **Plateau** instability; reject "Rayleigh-Taylor instability"]

[10e] Negative imaginary frequencies exist when there is a sharp gradient in this quantity in a shear flow, causing the Kelvin-Helmholtz instability. The curl of this quantity is vorticity.

ANSWER: flow **velocity** [accept **velocity** field or **velocity** profile; reject "speed" or "flow speed"]

<Physics>

12. Answer the following about the strange career of Walter Manny, an English sellsword who founded the London Charterhouse, for 10 points each.

[10e] Manny was an admiral during this duchy's "War of Succession" between John of Montfort and Charles of Blois ("BWAH"). This duchy was found on France's northwestern peninsula.

ANSWER: Duchy of **Brittany** [or Duché de **Bretagne**; or Dugelezh **Breizh**]

[10m] This man, who was perhaps Philippa of Hainault's ("ay-NO's") court poet, most likely exaggerated his friend Manny's exploits in his 14th-century history that covers most of the Hundred Years' War.

ANSWER: Jean **Froissart** [accept **Froissart**'s *Chronicles* or **Froissart**'s *Chroniques*]

[10h] Manny was both ally and enemy of this woman, who became a privateer after her husband, Olivier ("oh-liv-YAY"), was executed by the French court. This so-called "Lioness of Brittany" often left a single sailor alive so he could carry a decapitated head back to the court as a message.

ANSWER: Jeanne de **Clisson** [or Jeanne Louise de **Belleville**, de Clisson, Dame de Montaigu; prompt on **Jeanne Louise**]

<European History>

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Editors: Harvey, Apte, Evans, Golden, Karim, Kearney, Mao, Nediger, Peet, Settle, Silverman

13. This philosopher, who introduced Spinoza to the British public with the 1843 article “Spinoza’s Life and Works,” lived with the woman who produced the first English translation of Spinoza. For 10 points each:

[10h] Name this philosopher and literary critic whose drift away from Comtean (“KAHM-tee-in”) positivism is evident in his five-volume book *The Problems of Life and Mind*.

ANSWER: George Henry **Lewes**

[10e] Lewes lived with George Eliot, whose novel *Middlemarch* is often analyzed as a fictionalization of this treatise by Spinoza that is “demonstrated in geometrical order.”

ANSWER: **Ethics** [or **Ethics**, *Demonstrated in Geometrical Order*; or **Ethica**, *ordine geometrico demonstrata*]

[10m] Eliot’s translation of the *Ethics* slightly dampens Spinoza’s “pantheism” by putting parentheses around these two words that follow “God” in a three-word phrase that is often used to summarize Spinoza’s metaphysics.

ANSWER: **or nature** [or **sive Natura**; accept God **or nature** or Deus **sive Natura**]

<Philosophy>

14. Non-conscious information of this sensory modality is carried via the dorsal and ventral spinocerebellar tracts. For 10 points each:

[10m] Name this sense that relies heavily on muscle spindles and other signals from skeletal muscles. This ability may be tested by joint position reproduction.

ANSWER: **proprioception** [or **kinesthetic** sense; or **kinesthesia**; or word forms of **proprioceptive**; accept **proprioceptors** or **proprioceptors**; prompt on sense of **position**; reject “vestibular sense”]

[10h] These organs found in muscle-tendon junctions act as proprioceptors. These structures name the reflex that opposes the stretch reflex, in which muscle tension stimulating these organs causes autoinhibition.

ANSWER: **Golgi** tendon organ [or **Golgi** organ; or **neurotendinous** organ; or **neurotendinous** spindle; accept **Golgi** tendon organ reflex]

[10e] Golgi tendon organs consist of a sensory fiber innervating a bundle of fibers of this triple-helical elastic protein. In Golgi tendon organs, this protein’s fibers are less densely packed than in tendons and ligaments.

ANSWER: **collagen** [accept **collagen** fibers; accept type I **collagen**]

<Biology>

15. Pilgrims to this site have historically had trouble navigating the narrow and rocky isthmus allowing access to it, which legendarily allowed just three men to guard it. For 10 points each:

[10m] Name this medieval fortification on a rocky Cornish island. According to Geoffrey of Monmouth, a man recruited the help of Merlin to disguise himself so that he could seduce Duke Gorlois’s wife Igraine while at this location.

ANSWER: **Tintagel** (“tin-TAA-jel”) Castle [or **Dintagel**]

[10e] That disguised seducer was this man, who fathered the future King Arthur at Tintagel.

ANSWER: Uther **Pendragon** [or King **Uther**; or Ythyr **Ben Dragwn**]

[10h] Those seeking evidence for the “historical Arthur” often mention this artifact discovered at Tintagel in 1998. The sixth-century Latin inscription on this stone mentions a “descendent of Col” with a name superficially similar to Arthur’s.

ANSWER: **Artognou** stone

<Other Academic>

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16. Answer the following about Australopithecine fossils, for 10 points each.

[10m] In 1924, quarry workers at this site in South Africa discovered the first known Australopithecine fossil. Raymond Dart reported that skull of this site's namesake "child."

ANSWER: **Taung** [accept **Taung** Child or **Taung** Baby]

[10h] This set of caves in the "Cradle of Humankind," located close to Swartkrans and Kromdraai, has produced many of South Africa's Australopithecine fossils. "Mrs. Ples," the most complete skull of an *Australopithecus africanus*, was found in this set of caves.

ANSWER: **Sterkfontein** Caves

[10e] Fossils discovered by Mary and Louis Leakey indicate that a species of Australopithecines occupied this gorge in Tanzania after *Homo habilis*.

ANSWER: **Olduvai** Gorge [or **Oldupai** Gorge]

<Other History>

17. This nickname for renovations to a former prison farm emerged from activists occupying a region renamed Weelaunee Forest. For 10 points each:

[10m] Give this derisive two-word nickname that "forest defenders" have used to describe an 85-acre training facility built by the Atlanta Police Foundation.

ANSWER: "**Cop City**" [accept Stop **Cop City**]

[10h] January 2023 riots occurred after this Stop Cop City organizer from the "Defend the Atlanta Forest" movement was shot by police, becoming one of the first modern environmental activists killed in the US.

ANSWER: **Tortuguita** [or Manuel Esteban Paez **Terán**; accept **Tort**; prompt on **Paez**]

[10e] "Forest defenders" have slowed Blackhall's 155-acre facility for this industry near "Cop City." Efforts to add safety measures to guns in this industry emerged after Halyna Hutchins was killed in New Mexico in October 2021.

ANSWER: **film** industry [or **movies** or **motion pictures** or **cinema**; accept **TV** or **television**; accept **digital media**; accept **film** studios or **movie** studios; prompt on **Hollywood**; prompt on **entertainment** or **studios**]

<Current Events>

18. Allen Lane and his brothers founded this company to sell color-coded paperbacks through Woolworths for sixpence. For 10 points each:

[10e] Name this company that publishes canonical literature through an imprint of "Classics" with black spines.

ANSWER: **Penguin** Books [accept **Penguin**-Random House, accept **Penguin** Classics; reject "Random House"]

[10h] The Penguin Classics series was started by this British poet and classicist whose translation of the *Odyssey* was the first book in the series.

ANSWER: E. V. **Rieu** [or Emile Victor **Rieu**]

[10m] Romek Marber, who designed the covers for the Penguin Crime series, added a small white figure to visually identify books by this author. This author wrote about an aristocratic detective in novels like *The Nine Tailors*.

ANSWER: Dorothy **Sayers** [or Dorothy Leigh **Sayers**] (The detective is Lord Peter Wimsey.)

<British Literature>

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19. An ascending fourth, followed by five notes of an ascending minor scale, opens a much-quoted folk song from a region of this country that shares the beginning of its melody with the Catalanian *Song of the Birds*. For 10 points each:

[10h] Name this country that titles three nationalistic rhapsodies by a composer who included a “shepherd-girl’s dance” in the ballet *The Mountain King*.

ANSWER: **Sweden** [or Kingdom of **Sweden** or Konungariket **Sverige**; accept **Swedish** Rhapsody or **Svensk** rapsodi] (The song is the *Värmlandsvisa*.)

[10e] The first of Hugo Alfvén’s Swedish Rhapsodies is titled after this time period. This time period titles a Shakespeare play for which Felix Mendelssohn wrote an overture, and later, incidental music.

ANSWER: **midsummer** [accept *A Midsummer Night’s Dream*; accept *Midsommarvaka*]

[10m] The *Värmlandsvisa* was arranged as part of this composer’s suite *La Scandinavie*. This composer is better known for adapting the tunes *Molly on the Shore* and *Country Gardens*.

ANSWER: Percy **Grainger** [or Percy Aldridge **Grainger**]

<Classical Music>

20. The speaker wonders, “Didn’t we all have dream houses?” before fixating on a tree in a churchyard in Michelle Cliff’s poem about this person. For 10 points each:

[10h] Identify this person who names a game from a short story in which Shoshana, Yerucham, Debbie, and the narrator speculate about their neighbors while drunk and high together in a pantry.

ANSWER: Anne **Frank** [or Annelies Marie **Frank**; accept *What We Talk About When We Talk About Anne Frank*] (The Cliff poem is “A Visit to the Secret Annex.”)

[10e] While grieving her mom’s death, Nikki recalls reading Anne Frank’s diary in this author’s novel *Mother, Missing*. This American author also wrote “Where Are You Going, Where Have You Been?”

ANSWER: Joyce Carol **Oates**

[10m] This author critiqued the appropriation of Anne Frank’s legacy in the essay “Who Owns Anne Frank?” A Nazi guard throws the baby Magda against an electric fence in this Jewish-American writer’s story “The Shawl.”

ANSWER: Cynthia **Ozick**

<American Literature>