



**ACADEMIC
COMPETITION
FEDERATION**

ACF NATIONALS 2022

PACKET 9

Packet by

OSU A

Authors

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TOSSUPS

1. Two types of this quantity, with subscripts small-*b* and big-*S*, are compared in order to distinguish natural events from human-caused ones. This quantity's best-known scale was defined by its namesake using data from a Wood-Anderson device. A unit increase in a threshold for this quantity leads to a roughly tenfold dropoff in frequency, per a law co-named for Beno Gutenberg. This quantity is read off of a nomogram using several measurements of the S-P time difference and the peak amplitude. Measures of this quantity are complementary to location-dependent measures of intensity, such as the Modified Mercalli. In the 1970s, a measure of this quantity that saturates at high energies was phased out by USGS, in favor of a "moment" scale of this quantity. For 10 points, the Richter scale gives values like "8.0" for what logarithmic measure of an earthquake's strength?

ANSWER: earthquake **magnitude** [accept seismic **magnitude** or body-wave **magnitude** or surface-wave **magnitude** or Richter **magnitude** or local **magnitude** or moment **magnitude**; prompt on earthquake size or earthquake strength; prompt on Richter scale by asking "What quantity does that scale measure?"]

<Misc. Science>

2. A character in this play declares that the only thing that separates humans from "A wolf forgiven at his meat, / A beetle innocent in his copulation" is guilt. This play and *Our Town* are the two plays analyzed as examples of midcult in Dwight Macdonald's "Masscult and Midcult." In this play's first scene, the protagonist's daughter asks for the wishbone from the big turkey dinner the central family is eating. In this play's conclusion, a woman who holds a forsythia ("for-SITH-ia") twig she found among the ashes of a city instructs her husband to "blow on the coal of the heart." Mary and Jonathan die in a drunk driving accident and David is killed by a land mine in this play, in which a balloon vendor and a popcorn vendor named Mr. Zuss and Nickles don masks to play the roles of God and Satan. For 10 points, name this play by Archibald MacLeish that retells the Biblical story of Job.

ANSWER: **J. B.**

<American Literature>

3. *Note to players: Composer and genre required.* In a comedy routine, a passage from one of these pieces is effortlessly played by a piano cleaner and makeup girl while Victor Borge ("BOAR-guh") struggles. The most famous watercolor portrait of the composer of these pieces was painted by the dedicatee of two of them, who was briefly engaged to the composer before her father broke it off. One of these pieces begins with a short G-sharp upbeat, followed by a long G-sharp – E sixth dyad and a long F double-sharp – D-sharp sixth dyad. One of these pieces is nicknamed for having a 2/4 ("two-four") rhythm in the pianist's right hand against 3/4 ("three-four") in the left. Five of these pieces have the adjectives "grande" ("grahnd") and/or "brillante" ("bree-YAHNT") in their title. A D-flat one of them was purportedly inspired by watching a dog chase its tail. For 10 points, name these non-mazurka dances for piano by a 19th-century Polish composer, which include one nicknamed "Minute."

ANSWER: **waltzes** by Frédéric (François) **Chopin** [or **waltzes** by Fryderyk (Franciszek) **Chopin**]

<Classical Music>

4. Quoting Benedict Anderson, this thinker wrote "One man's imagined community is another man's political prison." An essay by this thinker proposes creating "social biographies" of the value of objects via "methodological fetishism." Another essay by this thinker begins by outlining a core tension between cultural "homogenization" and "heterogenization." This thinker called sacred objects "terminal commodities" in a book which builds on Igor Kopytoff's analysis of commodity pathways to call for studying "things in motion." This author of "Commodity and the Politics of Value" and *The Social Life of Things* proposed analyzing flows of people, technology, finance, media, and ideas, which he labeled as various "scapes," in an essay titled for "Disjunction and Difference." *Modernity at Large* is by, for 10 points, what Indian-American theorist of globalization?

ANSWER: Arjun **Appadurai** ("uh-PAH-doo-rye")

<Social Science>

5. In a speech replying to Peter Borthwick, this politician said their country owed a “great deal of reparation to Africa” over slavery. This politician’s first government formed after the collapse of the Aberdeen ministry. This politician gave a speech endorsing the “Conspiracy to Murder” bill in response to the Orsini affair. Another speech by this politician labeled Austria and Russia as “despots, tyrants, and odious assassins” while welcoming Lajos Kossuth (“LAH-yosh KOH-shoot”). This man said that every British subject should be endowed with similar protection as Roman citizens abroad in the “Civis Romanus Sum” speech during the Don Pacifico Affair. He read *Uncle Tom’s Cabin* thrice while deliberating support for the Confederacy during the U.S. Civil War. John Russell often clashed with, for 10 points, what Whig who dominated British foreign policy in the mid-19th century?

ANSWER: Lord **Palmerston** [or Henry John **Temple**, 3rd Viscount Palmerston]

<European History>

6. In one poem, a member of this profession is compared to two great predecessors and told, “you’ll never make the third.” That member of this profession recalls leaning out a window and hearing people singing, “Flower o’ the broom, / Take away love, and our earth is a tomb!” In another poem, a member of this profession declares, “I’m the weak-eyed bat no sun should tempt / Out of the grange whose four walls make his world,” when recalling departing the luxurious life he once lived among French royalty. The complaint “a man’s reach should exceed his grasp, / Or what’s a heaven for?” appears in that poem titled for one of these people, which ends with the sound of “the Cousin” whistling, possibly for sex from the speaker’s wife, Lucrezia. For 10 points, name this profession of the speakers of Robert Browning’s monologues “Fra Lippo Lippi” and “Andrea del Sarto.”

ANSWER: **painter** [prompt on artist; prompt on priest or friar or monk by asking “What other profession is he best known for?”]

<British Literature>

7. A book by this non-French thinker uses the term “mediated lives” to refer to living beings and posited a “liquid soul” that lived in the pineal gland. At age 26, this non-Leonardo person sent a sketch of a flying machine to the journal *Daedalus Hyper-boreus*. This author of *Economy of the Animal Kingdom* proposed a set of points that mediate between the finite and infinite in *The Principia, or First Principles of Natural Things*. This thinker posited an unreligious text called the Ancient Book, which was used by angels, in a book that describes omnipresent connections between spiritual and physical worlds called “correspondences.” This author of *Arcana Coelestia* (“ar-KAH-nah koy-LES-tee-ah”) claimed to have witnessed the entirety of the Last Judgment in 1757. The book *Heaven and Hell* is by, for 10 points, what religious mystic and philosopher from Sweden?

ANSWER: Emmanuel **Swedenborg** [or Emanuel **Swedborg**]

<Other Academic>

8. This process occurs in more than 10% of the genes in the marine ciliate *Euplotes octocarinatus*. Polyamines induce this process to synthesize the antizyme of ornithine decarboxylase. The COVID drug candidate merafloxacin (“mera-FLOX-uh-sin”) inhibits this process by blocking formation of a pseudoknot. This process regulates the stoichiometry of the subunits of *E. coli*’s Pol III (“three”) enzyme and the lambda phage tail protein. This process creates unnatural Gag-Pol fusions in HIV. The “minus one” form of this process is obligatory for synthesis of the SARS-CoV-2 RNA polymerase when it happens at the junction between ORFs (“orfs”) 1a and 1b. This process occurs at repetitive, AU-rich sequences in polycistronic (“poly-SIS-tronic”) genes when a tRNA anticodon “slips.” For 10 points, name this process in which a translating ribosome translocates one or two nucleotides, leading to a namesake mutation.

ANSWER: programmed ribosomal **frameshifting** [or **PRF**; prompt on translocation until it is read; prompt on mutation until it is read; prompt on slipping or slippage until it is read; prompt on ribosomal stalling; prompt on skipping; prompt on shifting]

<Biology>

9. A leader of this organization implored his followers to “Be Men with a Capital M” in the fourth section of his collection *Bunch of Thoughts*. Members of this organization introduce themselves by saying “I am an ordinary volunteer” at daily one-hour meetings called *shākhā*. The “family” of this organization includes the student group ABVP and the VHP, which has units dedicated to “re-conversion.” The Liberhan commission accused a regional government of being run by this organization, which recently adopted dark brown trousers to replace its iconic khaki shorts. Volunteers from this group are widely blamed for demolishing Ayodhya’s (“uh-YODE-yah’s”) Babri Masjid. It was earlier banned after one of its members, Nathuram Godse (“NAH-too-rum GOAD-say”), assassinated Mahatma Gandhi. A saffron flag symbolizes, for 10 points, what right-wing paramilitary Hindu nationalist group? ANSWER: **RSS** [or **Rashtriya Swayamsevak Sangh**; prompt on **Hindutva** or **Hindu nationalists** by asking “What specific organization representing that ideology?”; prompt on **BJP** or **Bharatiya Janata Party** by asking “The BJP is often considered the political wing of what other group?”]

<World History>

10. Clusters of the palm-like pandani can be found in the highland regions of this island near Dove Lake. This island’s isthmus of Eaglehawk Neck is home to the textbook example of tessellated pavement. This island is home to both the oldest known living plant, a 43,000-year-old clonal colony called King’s Holly, and the world’s third tallest tree, a mountain ash named Centurion. Shipbuilders once prized this island’s native Huon pines, which live far south of its cool-temperate Tarkine (“tar-kyne”) rainforest. Since the 1990s, a mammal native to this island has been devastated by a facial tumor disease. A cousin of the numbat hunted to extinction on this island is given its common name for resembling a wolf or a striped large cat. The thylacine was the namesake “tiger” of, for 10 points, what island, home to a black-furred carnivore called its namesake “devil?”

ANSWER: **Tasmania** [accept **lutruwita**; accept **Tasmanian** devil; accept **Tasmanian** tiger or **Tasmanian** wolf]

<Geography>

11. This text describes a technique of barking and eating dog poop as a method of “Ritual Deception” of its central concept. The line “let virtue and goodness be perfected in every way” concludes this text, which Robert Thurman translated with the subtitle “understanding in the between.” This text instructs how to choose among five different paths to the “womb-door” and distinguish between “peaceful” and “wrathful” deities. Walter Evans-Wentz produced an error-filled translation of this text, which was compiled from the teachings of Padmasambhava (“PUDD-muh-SUM-buh-vuh”) by a sage of the Nyingma (“NEENG-muh”) school. This text describes a journey lasting for 49 days between different phases of *saṃsāra* (“sun-SAH-ruh”). Aldous Huxley gave Timothy Leary a copy of, for 10 points, what Vajrayana (“vuh-j’ruh-YAH-nuh”) Buddhist text about a journey through the *bardo* realm by the soul?

ANSWER: *The Tibetan Book of the Dead* [or *Bardo Thodol*, or *Liberation Through Hearing During the Intermediate State*; prompt on Book of the Dead] (Robert Thurman is Uma Thurman’s dad.)

<Religion>

12. Eighteen critics of this country's leader signed a manifesto named for its lavish Caravelle Hotel which, like the Hotel Majestic and Rex Hotel, catered largely to visitors. Rich businessmen in this country got free U.S. dollars to buy foreign goods for cheap under the Commercial Import Program. A campaign to ban concubinage in this country was led by a *de facto* first lady nicknamed "Dragon Lady." In his book *Dereliction of Duty*, H. R. McMaster savages the endorsement of coups in this country by U.S. ambassador Maxwell Taylor. This country created "agrovilles" of rural residents, such as minority Montagnards ("mon-tahn-YARS"), in a precursor to its Strategic Hamlet Program. Exiles from this country fly a flag with three thin horizontal red stripes on a yellow field. For 10 points, name this country where strife between Catholics and Buddhists was worsened by Ngo Dinh Diem ("ung-OH deen yeem").

ANSWER: **South Vietnam** [or **Republic of Vietnam**; or **Việt Nam Cộng Hòa**; or **RVN**; prompt on **Vietnam**; reject "North Vietnam"; reject "Democratic Republic of Vietnam"; reject "Viet Cong"; reject "French Indochina"; reject any Vietnamese answer with "Dân chủ" in it] ("Personalism" was developed by Ngô Đình Nhu, whose wife Trần Lệ Xuân (Madame Nhu) was nicknamed "Dragon Lady" in foreign media.)

<Other History>

13. A female author from this country lived in a custom-built "House of the Sun," and wrote about the math professor Amós's racing thoughts. An unhappy wife often recalls lying face-down on a beach after her dad's death, and living with an aunt who called her a "viper," in a debut novel from here, published when its author was 23. This is the home country of the author of *With My Dog Eyes*, Hilda Hilst. The protagonist defines herself as a virgin who likes Coca-Cola in a novella set in this country, which lists thirteen alternative titles on its title page. In that novella set here, a girl is told she will marry a rich foreigner named Hans by the fortune teller Madame Carlota, but is fatally hit by a Mercedes later that day; Rodrigo G. M. narrates that novella about the waif Macabéa. *Near to the Wild Heart* and *The Hour of the Star* is set in, for 10 points, what Western-hemisphere home of Clarice Lispector?

ANSWER: Federative Republic of **Brazil** [or República Federativa do **Brasil**]

<World Literature>

14. *Note to players: The answer to this tossup includes both a phenomenon and a setting, such as "bubbles in water."* In one diagram, thirteen classes of these phenomena in this setting are bounded by lines on which the Stix elements S , R , and L are either zero or infinite. Stringer diagrams describe the temperature dependence of these phenomena, expanding on the "cold" set of them found on a CMA diagram. A set of these phenomena that are produced by tension in magnetic field lines travel at a speed proportional to the B -field. Particles with a similar velocity to these phenomena extract energy from them in Landau damping. Generally, their namesake frequency is equal to the square root of [read slowly] "density times e -squared" over "mass times epsilon," and is inversely proportional to the Debye ("duh-BYE") length. Ions and electrons are moved by, respectively, the Alfvén ("al-VAIN") and Langmuir ("LANG-mure") types of these phenomena. For 10 points, name *both* these oscillations and the ionized state of matter in which they propagate.

ANSWER: **waves** in **plasmas** [accept **plasma waves**; accept **oscillations** in **plasmas** or **plasma oscillations** before "oscillations"; accept **plasma modes**; prompt on **waves** or **oscillations** or **modes** or **Alfvén waves** or **Langmuir waves** by asking "In what setting?"]

<Physics>

15. Colorful concentric circles cover this woman's breasts and abdomen in a two-piece dress created by Sonia Delaunay ("duh-loh-NAY") for a namesake ballet. Artemisia Gentileschi's ("jen-tee-LESS-kee's") *Danaë* borrows its central figure from a painting of this person that is attributed to either Artemisia or her father. Another painting of this person by Gentileschi shows a maid pulling back a curtain as another maid wipes away a tear. Those works model this woman's pose on *Sleeping Ariadne*, a Roman sculpture that was once thought to depict this woman because of the shape of her bracelet. In a marble sculpture by Edmonia Lewis, this person sits slumped on a throne. Thick blue eyeshadow and a gold dress adorned with phoenix feathers were part of the costume for this title character of a 1963 film starring Elizabeth Taylor. For 10 points, name this historical figure whose death scenes often include an asp.

ANSWER: Cleopatra [or Cleopatra VII Philopator; accept Cléopâtre]

<Painting/Sculpture>

16. Cato Perkins, a man who took up arms to support this political faction, was part of a resettled community whose preacher was the Huntingdonian John Marrant. This faction enlisted support by guaranteeing land purchase rights by the Haldimand Proclamation and "full security" to those who enlisted under the Philipsburg Proclamation. Samuel Birch created the *Book of Negroes* to list supporters of this faction who were resettled in Nova Scotia, many of whom went to Sierra Leone. This faction's losses at the Battle of Great Bridge included several members of the Ethiopian Regiment recruited by Lord Dumore, who guaranteed freedom for indentured servants and slaves who took up arms to support this faction in 1775. For 10 points, name this faction which supported the British Crown during the American Revolution.

ANSWER: Loyalist faction [or Loyalists or Tory faction or Tories; prompt on Conservatives; prompt on pro-British faction before "British"; prompt on slaves who fought for Britain; reject "slaves"]

<American History>

17. In one of this man's novels, a medical student avoids the theater after a "dreadful" feeling makes him "indisposed" at a staging of Chekhov's *The Cherry Orchard*. This author was in a duo dubbed "the Nose and the Giant" or "the homo-intellectuals" with chess player Jan Hein Donner, the basis for a Phaistos disk-obsessed linguist created by this author. The protagonist goes into anesthesiology in a novel by this man with time skips between five "episodes." This novelist created Ada, who has sex with two lovers while in Cuba to play cello for Fidel Castro, conceiving Quinten. In a novel by this man, the policeman Fake's ("FAH-kuh's") corpse is dragged to a house where Anton's family is then killed by Nazis. He also wrote of an angel manipulating people to get the Ten Commandments back from Earth. For 10 points, name this novelist of *The Assault* and *The Discovery of Heaven*, who wrote in Dutch.

ANSWER: Harry Mulisch

<European Literature>

18. Nucleic acid puckering parameters are linear combinations of five of these quantities, which freely vary around a compass wheel unless they are "locked" by a bridging methylene. IUPAC ("I-U-pack") categorizes these values as *ac*, *ap*, *sc*, or *sp*. This quantity is lower in di-fluoro compounds than di-iodo compounds because of an effect driven by hyper-conjugation. Three-bond proton NMR coupling constants are a function of only this quantity in the Karplus equation. Internal MD simulations often iterate over these quantities, since they vary more than Cartesian coordinates. A plot of this quantity versus energy has extrema at gauche ("goash"), staggered, and eclipsed positions. This quantity is visualized for alkane conformers by staring down a single bond and plotting the other six substituents on a Newman diagram. For 10 points, name this angle formed between bonding planes in a molecule.

ANSWER: dihedral angle [or torsion angle; or torsional angle; or torsions; prompt on angle; reject "bond angle"; reject "torsional strain" or "strain"]

<Chemistry>

19. The claim that this dialogue's false dichotomy should be relieved by adding the Third Estate to transform it into a triologue is made in "The Invention of the Science Wars" in Bruno Latour's ("luh-TOOR's") *Pandora's Hope*. This dialogue's namesake is credited with the argument that we can't understand what we communicate, can't communicate what we know, and can't know what exists, if anything actually exists, which it doesn't. In this dialogue, Socrates asks whether a doctor's superior knowledge of dietary health entitles him to more food than non-doctors and argues that escaping punishment for committing a crime is worse than being punished. Socrates debates Polus and Callicles in this dialogue, which ends with the parable of the Judgment of Naked Souls. For 10 points, name this Platonic dialogue about the nature of rhetoric, which, like Protagoras, is named for a Sophist.

ANSWER: Gorgias

<Philosophy>

20. This musician's solo on a 1939 recording of "Pound Cake" was used 17 years later as the basis for Woody Herman's song "Blues Groove." This musician purportedly carried around a recording of "Singin' the Blues" by Frankie Trumbauer, whose sound served as his model. In this musician's first ever recording, his solo is followed by a cup-muted trumpet solo by Carl "Teddie" Smith, performing "Lady Be Good." This musician is widely credited with coining the jazz meaning of the word "cool." He "dueled" with Herschel Evans, when they played the same instrument in Count Basie's band, with whom he played a song titled "[this man] Leaps In." This dedicatee of Charles Mingus's "Goodbye Porkpie Hat" gave the nickname "Lady Day" to frequent collaborator Billie Holliday, who in turn gave him his main nickname. For 10 points, name this tenor saxophonist, nicknamed "Prez."

ANSWER: Lester (Willis) Young [prompt on Prez or Pres; prompt on "Lester Leaps In"]

<Other Fine Arts>

BONUSES

1. After this character rings the doorbell four times and is admitted, characters argue about whether a doorbell's ring means that someone is there or that no one is there. For 10 points each:

[10m] Name this character. He tells the Smiths the story of a male calf that gives birth to a cow after eating ground glass, and the story of a dog who doesn't swallow its own trunk because it thinks it's an elephant.

ANSWER: The **Fire Chief** [or *le capitaine des pompiers*]

[10e] The Fire Chief appears in this "anti-play" by Eugène Ionesco ("yoh-NESS-koh"). Mrs. Smith claims that this play's title singer always styles her hair in the same way.

ANSWER: *The **Bald Soprano*** [or *La **Cantatrice chauve***; or *The **Bald Prima Donna***]

[10h] This author wrote one of the only other self-described "anti-plays." The cast of that play by him consists of four "Speakers" who repeatedly emphasize that they are not in a play and who follow "Rules for the actors" listed in the script.

ANSWER: Peter **Handke** ("HAHNT-kuh") (That "anti-play" is *Offending the Audience*.)

<European Literature>

2. In an article for *The Point* released on this philosopher's 90th birthday, Raymond Geuss ("goyss") claimed that the success of the Brexit campaign belies this man's faith in "the power of the better argument." For 10 points each:

[10e] Name this pro-E.U. German philosopher. He wrote of a "political public sphere" in *The Theory of Communicative Action*.

ANSWER: Jürgen **Habermas**

[10m] Habermas wrote that instrumentally rational "systems" are "colonizing" this realm of consensus-based, meaningful, symbolically mediated interaction. This compound word was used previously by Edmund Husserl.

ANSWER: **lifeworld** [or *Lebenswelt*]

[10h] Habermas and his disciple Axel Honneth have used this quasi-medical term for distortions in a society that take it further from ideal rationality. Christopher Zurn discussed these as "second-order disorders."

ANSWER: social **pathology** [or social **pathologies**; or **pathologies** of the social; or **pathologies** of reason; accept *Pathologie des Sozialen*; prompt on diseases of society]

<Philosophy>

3. Answer the following about Eugene Wigner's ("VEEG-ner's") contributions to quantum mechanics, for 10 points each.

[10h] Wigner's theorem states that symmetry operators must have *one* of these *two* properties. Parity inversion has one of them, while time reversal has the other. Name both.

ANSWER: **unitary** AND **anti-unitary** [accept answers in either order; accept **unitarity** AND **antiunitarity**]

[10e] Wigner held that this process requires consciousness, a stance that David Griffiths' *Introduction to Quantum Mechanics* calls "stultifying solipsism." In many interpretations, this experimental process collapses a wavefunction.

ANSWER: quantum **measurement** [or quantum **observation**; accept any description of **measuring** or **observing** a system]

[10m] Wigner used representations of the Poincaré ("pwan-kah-RAY") group to classify particles by whether their values for energy and this quantity are positive or zero. Virtual particles lie "off" a hyperboloidal surface named for this quantity.

ANSWER: **mass** [accept **mass** shell; accept rest **mass** or invariant **mass**; prompt on *m*]

<Physics>

4. Ingrid Olderöck earned the nickname “Woman of the Dogs” during her working for this organization by using dogs to torture her victims. For 10 points each:

[10m] Name this organization which separated from the military under Decree 521. During the Pinochet regime, this organization assassinated many political opponents including Carlos Prats and Orlando Letelier.

ANSWER: **DINA** (“deena”) [or La **Dirección de Inteligencia Nacional**]

[10h] The DINA’s top recruits included this American operator of an anti-Allende (“uh-YEN-day”) radio station. This man was extradited and convicted in 1978 for his role in the killings of Prats and Letelier.

ANSWER: Michael **Townley**

[10e] The DINA was part of this collaboration between South American military regimes to eliminate political dissidents. This campaign takes its name from a bird of the Andes.

ANSWER: Operation **Condor**

<World History>

5. Ahmed Elgammal headed a project devoted to this task, whose product was premiered at the Telekom Forum in Bonn. For 10 points each:

[10h] Identify this task, most famously performed in part by Barry Cooper. Walter Werzowa helped sort through hundreds of variations produced by AI for a much-hyped completion of this task released in October 2021.

ANSWER: completing **Beethoven’s tenth symphony** [accept any equivalent for completing, that mentions writing or composing the symphony; prompt on completing a **Beethoven symphony** by asking “which one?”; prompt on writing a **symphony** or **composing music** or similar equivalents by asking “what specific piece is being composed?”]

[10e] Cooper’s completion of the tenth features a C minor Allegro in 6/8 (“six-eight”), much like the first movement of this German composer’s first symphony, which was once dubbed “Beethoven’s Tenth.”

ANSWER: Johannes **Brahms**

[10m] The nickname “Beethoven’s Tenth” was devised by this German conductor and pianist, who conducted the premiere of *Tristan und Isolde*. His wife Cosima, who was Liszt’s daughter, left him to become Wagner’s second wife.

ANSWER: Hans (Guido) von **Bülow**

<Classical Music>

6. As ligands, these compounds both donate sigma electrons to a metal and accept pi electrons, which causes their complexes to resemble cyclo-propane rings. For 10 points each:

[10m] Name these organic compounds. As ligands, their covalent compounds are described by the Dewar–Chatt–Duncanson model and include Zeise’s (“ZAY-suh’s”) salt.

ANSWER: **alkenes** [or **olefins**]

[10e] Pi backbonding leads to a small but measurable increase in this quantity for alkenes bound to metals, compared to free alkenes. For carbon-carbon bonds, this quantity is usually about one-and-a-half angstroms.

ANSWER: bond **length** [or bond **distance**]

[10h] Since alkenes form part-covalent, part-dative bonds with metals, they are in *both* of these two major classes of electron-donating ligands. Name both classes, each identified by a letter of the alphabet.

ANSWER: **L**-type ligands AND **X**-type ligands [accept either order]

<Chemistry>

7. Name these American female entrepreneurs from the 19th century, for 10 points each:

[10e] This owner of the Villa Lewaro estate launched a cosmetics line that included many hair products for Black women. She is sometimes considered the first self-made female millionaire in American history.

ANSWER: Madame C. J. **Walker** [or Sarah **Breedlove**]

[10m] With her sister Tennie, this woman opened the first female-owned Wall Street brokerage and started a weekly magazine whose salacious articles prompted a censorship campaign by Anthony Comstock.

ANSWER: Victoria **Woodhull** [or Victoria **Clafin** Woodhull]

[10h] This woman became D.C.'s leading dressmaker after buying her freedom in 1855. Her White House memoir *Behind the Scenes* is a major primary source on the Lincoln family.

ANSWER: Elizabeth Hobbs **Keckley**

<American History>

8. In Matthew 23, Jesus mentions the slaying of a prophet of this name "between the temple and the altar." For 10 points each:

[10m] Give this name of a prophet whose book prophesies a king "riding upon an ass, and upon a colt the foal of an ass." Another man of this name was struck dumb when his aged wife Elizabeth became pregnant.

ANSWER: **Zechariah** [or **Zacharias**; accept **Zechariah** ben Barchiah]

[10e] Zechariah and Haggai both emphasize this building project completed under Zerubbabel. To this day, Jews in Jerusalem pray at what they believe is the remains of this building's Western Wall.

ANSWER: The **Second Temple** [or **Beit HaMikdash**; prompt on **Temple**]

[10h] In the Book of Zechariah, God foretells bringing forth a servant who is referred to as one of these objects and who will "build the temple of the Lord." This term is rendered with all caps in the King James Version.

ANSWER: the **BRANCH** [or **Tzemach**]

<Religion>

9. A woman who serves this foodstuff at Weydon-Priors fair adds alcohol to it if customers wink at her and pay her extra. For 10 points each:

[10h] Name this foodstuff. In *The Mayor of Casterbridge*, Michael Henchard consumes too much of this foodstuff, which has been spiked with rum, causing him to become belligerently drunk and sell his wife and child.

ANSWER: **frumenty** [or **furmity**; or **fromity**; or **fermenty**; prompt on **porridge**; prompt on **mash**]

[10e] Alice is told by a gnat that the snap-dragon-fly lives only on mince pies and frumenty in this sequel to *Alice's Adventures in Wonderland*.

ANSWER: **Through the Looking-Glass, and What Alice Found There** [or Alice **Through the Looking-Glass**]

[10m] Margaret Dawson learns to make frumenty at Hanbury Court in this author's novel *My Lady Ludlow*. This author wrote a novel in which Margaret Hale moves from the village of Helstone to the industrial town of Milton.

ANSWER: Elizabeth **Gaskell** [or Elizabeth Cleghorn **Stevenson**] (The latter novel is *North and South*.)

<British Literature>

10. To help Quetzalcoatl (“ket-sahl-koh-AHT-ull”) answer a challenge posed by the ruler of this realm, a worm bored holes through a shell to turn it into a trumpet, and bees flew inside to amplify its sound. For 10 points each:

[10m] Name this realm from which Quetzalcoatl retrieved a set of bones, but only after they were broken and a quail gnawed on them. This realm was ruled by a similarly-named god and goddess.

ANSWER: **Mictlan** [prompt on Aztec underworld; prompt on Mictlantēcutli or Mictēcacihuātl]

[10e] The bones sought by Quetzalcoatl were those of humans who had drowned when Chalchiuhtlicue was serving in this position. In addition to war, Huitzilopochtli was the god of this domain.

ANSWER: **sun** [accept the Fourth **Sun**]

[10h] One of the tests faced during the journey to Mictlan was traversing a path with this notable characteristic on the mountain Itztépetl.

ANSWER: it was made of **obsidian** [prompt on sharp by asking, “What made it sharp?”; prompt on made of glass or made of knives by asking “What specific kind of glass?” or “What specific kind of knives?”]

<Mythology/Legends>

11. A set of four rune-carved stones from this city include the two Sigtrygg (“SIG-trigg”) stones, which are evidence of Olof the Brash’s rule during the 10th century. For 10 points each:

[10h] Name this settlement in Schleswig (“sh’LAYS-vick”)-Holstein. Only about 5% of this site has been excavated so far, but it is still the largest Viking settlement in present-day Germany.

ANSWER: **Hedeby** (“HAY-the-bee”) [or **Haithabu** or **Heiðabýr**]

[10m] Another of the Hedeby stones was placed by this king as a tribute to his retainer Skarhi. This father of Cnut the Great was the first Danish king of England.

ANSWER: **Sweyn** Forkbeard [or **Sveinn** Tjúguskegg or **Suanus** Rex]

[10e] Hedeby was later sacked by this king during his war with another Sweyn. Coincidentally, Hedeby was destroyed in 1066, the same year this Norwegian died at the Battle of Stamford Bridge.

ANSWER: Harald **Hardrada** [or **Harald Sigurdsson** or **Harald III** (“the-third”); prompt on Harald]

<European History>

12. This leader’s government blocked Facebook in 2021, claiming the site had “arrogantly” removed accounts linked to his re-election campaign. For 10 points each:

[10m] Name this African leader who declined to sign the queerphobic Sexual Offenses Bill after his 2021 re-election. Previously, he signed the controversial “Kill the Gays” bill in 2014.

ANSWER: Yoweri **Museveni** (He is the leader of Uganda.)

[10e] This West African country is one of three on the continent where homosexuality is nationally punished with the death penalty. An estimated 10 to 20% of the population is enslaved in this country, whose capital is Nouakchott (“nwack-SHOT”).

ANSWER: **Mauritania** [or Islamic Republic of **Mauritania**, or **Mūrītānyā**, or **Mauritanie**; or **Agawej**, or **Cengit**, or **Moritani**, or **Gànaar**, or **Murutaane**]

[10h] In 2020, 80% of this country’s residents told Afro-barometer that they would not be bothered by an LGBTQ neighbor, the highest of any African country. Trans people in this country are often called “tchindas” (“CHEEN-dahs”), referring to trans actor and activist Tchinda Andrade (“ahn-DRAH-dee”).

ANSWER: **Cape Verde** [or Republic of **Cape Verde**, or República de **Cabo Verde**, or República di **Kabu Verdi**]

<Current Events>

13. This triple portrait shows the grandnieces of Horace Walpole embroidering with silk around a small table, in a likely allusion to the Fates. For 10 points each:

[10h] Name this painting by Joshua Reynolds that depicts three sisters, who are strikingly dressed in identical white gowns and wear the same powdered gray wigs and pale white makeup.

ANSWER: The Ladies Waldegrave

[10e] Reynolds also drew from mythology for his portrait of this leading actress as “the Tragic Muse,” Melpomene (“mel-PAH-muh-nee”). Thomas Gainsborough reportedly exclaimed about this woman’s nose, “There’s no end to it!”

ANSWER: Sarah Siddons [or Sarah Kemble]

[10m] Thomas Lawrence, who was romantically involved with two of Sarah Siddons’ daughters, may be best known for a portrait of a girl dressed in this title color, which hangs opposite *The Blue Boy* at the Huntington Library.

ANSWER: pink [accept Pinkie]

<Painting/Sculpture>

14. This man put praise for the “shining” beauty of women named Agido and Hagesikhora (“HAH-guh-sih-KOH-ruh”) in a *Partheneion* (“PAR-thuh-NAY-on”), or “Maidens’ Song,” that may have been sung by many women. For 10 points each:

[10h] Name this 7th-century BCE author, the oldest Ancient Greek lyric poet with fragments that survive. Unusually for such poets, he wrote in the Doric dialect.

ANSWER: Alcman of Sparta [or Alcmaeon of Sparta]

[10e] Many of Alcman’s lines use four of this metrical foot with a long–short–short pattern. Aptly, its name can mean “toe,” or more commonly “finger.” Ancient epics used its hexameter.

ANSWER: dactyl (“DACK-till”) [or dáktylos; accept dactylic tetrameter; accept dactylic hexameter]

[10m] Alcman is often credited with having the chorus dance to the right during this opening section of a lyric poem, and dance to the left during the second section. This open section is followed by one named in opposition to it, and then by the *epode*.

ANSWER: strophe [reject alternatives]

<World Literature>

15. One version of this pathway in archaea has an intermediate consisting of a 3,5-bis-phosphate (“3-5-bis-phosphate”) derivative of its namesake six-carbon product. For 10 points each:

[10m] Name this highly conserved biochemical pathway whose products include IPP and DMAPP. This pathway begins with two acetyl-CoA (“uh-SEE-till-co-A”) fusing to aceto-acetyl-CoA.

ANSWER: mevalonate (“muh-VAL-oh-nate”) pathway [or mevalonic acid pathway; accept isoprenoid pathway or HMG-CoA reductase pathway; prompt on cholesterol synthesis pathway]

[10e] The rate-limiting step of the mevalonate pathway is catalyzed by HMG-CoA reductase, which is inhibited by this class of drugs that lowers cholesterol. Rarely, these drugs can cause muscle breakdown and inflammation.

ANSWER: statins (“STAT-ins”)

[10h] The first enzyme in the mevalonate pathway is this type of enzyme, which is responsible for converting two units of acetyl-CoA to acetoacetyl CoA.

ANSWER: thiolase [or acetoacetyl-CoA thiolase]

<Biology>

16. An image created by this artist shows an arrangement of fossil shells laid out neatly in a grid across three horizontal shelves. For 10 points each:

[10e] Name this French artist and inventor who introduced a namesake early photographic process to the Académie des Sciences in 1839. That namesake “-type” involves exposing a polished, silver-plated sheet of copper.

ANSWER: Louis **Daguerre** (“dah-GAIR”) [or Louis-Jacques-Mandé **Daguerre**]

[10h] One of this artist’s photomontages shows a hand emerging from a shell and dipping some of its fingers into the sand. This photographer’s Alfred Jarry-inspired *Portrait of Ubu* is a closeup of a baby armadillo.

ANSWER: Dora **Maar** [or Henriette Theodora **Markovitch**]

[10m] This American’s photograph *Nautilus* depicts a nautilus shell standing on its end against a black background. This artist’s sensuous photo *Pepper No. 30* is often described as being erotically charged.

ANSWER: Edward **Weston** [or Edward Henry **Weston**]

<Other Fine Arts>

17. The controversial introduction of this book declares that a “true Asian-American sensibility” is “non-Christian, nonfeminine, and nonimmigrant.” For 10 points each:

[10h] Name this anthology whose preface declares “Asian-Americans are not one people but several,” but then limits the identifier to Chinese, Japanese, and Filipino-Americans. This anthology with an onomatopoeic title was edited by a team including Frank Chin.

ANSWER: **Aiiiiieee!** *An Anthology of Asian-American Writers* [reject “*The Big Aiiiiieee!*”]

[10e] In the opening essay of the expanded *Big Aiiiiieee!*, Chin attacks this author of *The Woman Warrior* for “invent[ing] a ‘fake’ Chinese-American culture.”

ANSWER: Maxine Hong **Kingston**

[10m] Chin debated Yunte Huang about the stereotypes perpetuated by this character, who was introduced by creator Earl Biggers in the novel *The House without a Key*.

ANSWER: Charlie **Chan** [prompt on **Charlie**]

<American Literature>

18. This man’s laws set the size of the Boule (“BOO-lay”) assembly at 400 and excluded the lowest social class, the *thetes*, from participating in it. For 10 points each:

[10e] Name this Athenian statesman of the early 6th century B.C.E. He repealed all the laws of Draco and replaced them with a new constitution.

ANSWER: **Solon** [accept **Solonian** constitution]

[10h] Solon’s constitution defined this class of people as those who produced 200 measures of crops each year, and could thus afford to fight as hoplites. The name of this class comes from the word for “yoke.”

ANSWER: **zeugitai** (“ZEW-ghee-tye”) [or **zeugitae**] (The word for yoke is *zeugos*.)

[10m] This other class ranked just above the *zeugitai* in terms of property holdings. This Athenian social class was analogous to the Roman *equites* (“EK-wee-tays”). You may give the Greek answer or its standard English translation.

ANSWER: **knights** [or **hippeús** or **hippeis**; prompt on **horsemen** or **cavalrymen**]

<Ancient History>

19. Ohio State professor Vitaly Bergelson generalized Szemerédi's ("SEH-muh-RAY-dee's") theorem on arithmetic progressions to a version concerning these functions. For 10 points each:

[10e] Name these functions whose terms are non-negative powers of their independent variables. For a single-variable one of these functions in x , the highest power of x is called its degree.

ANSWER: **polynomials**

[10m] This theorem states that any continuous function on a closed interval can be uniformly approximated by polynomials. Marshall Stone generalized this theorem to arbitrary compact Hausdorff spaces.

ANSWER: **Weierstrass** ("VYRE-shtrahss") approximation theorem [accept Stone-**Weierstrass** theorem]

[10h] The Weierstrass theorem shows that the space of continuous functions on a closed interval has this topological property, since it contains the polynomials with rational coefficients as a countable dense subset.

ANSWER: **separable** [accept **separability**]

<Misc. Science>

20. This phonological process can be analyzed in Optimality Theory using constraints that punish peaks in prominence that do not bear stress. For 10 points each:

[10m] Name this process by which a stressless nucleus segment neutralizes to a more central position, and often loses length and tenseness. This process yields the differing first syllables of the words *Canada* and *Canadian*.

ANSWER: vowel **reduction** [vowel **weakening**; or word forms such as **reduced** or **weakened**]

[10e] This mid central vowel is the most common outcome of English vowel reduction. It is written with a lowercase "e" rotated 180 degrees, and is the first and last vowel in the word *banana*.

ANSWER: **schwa** ("sh'WAH")

[10h] Prosodic features such as stress are often treated as these objects that live in "tiers" separate from consonants and vowels. These features grew out of William Leben and John Goldsmith's dissertations in the 1970s.

ANSWER: **autosegment** [or word forms such as **autosegmental**; accept **suprasegment** or **supersegment** or word forms]

<Social Science>