

## 2021 ARCADIA 🐉

Edited by Vincent Du, Jacob Egol, Henry Goff, Hasna Karim, Grant Peet, Ryan Rosenberg (head), Payton Schubel, Kevin Thomas, and Annabelle Yang

Written by Michael Bucknall, Daniel Cronin, Jim Fan, Eric Gunter, Kevin Jiang, Caroline Mao, Erik Novak, Jonathan Shauf, Ashish Subramanian, Raymond Wang, Brandon Weiss, Justin Zhang, and the editors

**Packet 1:** No questions, just vibes.

Tossups

1. **An essay defining this practice as a “contemporary...entry ticket” concludes, “‘European Union’ may be a response to history, but it can never be a substitute.” That essay about this practice forms the epilogue to Tony Judt’s *Postwar*. A triangular spike diagonally bisects a museum that is built into a hill and is dedicated to this practice. Observers criticized Viktor Orbán’s creation of the House of Fates, a museum dedicated to this practice, as (\*) whitewashing Hungary’s history. At 10:00 am, sirens blare for two minutes to indicate a period of total inaction during a holiday dedicated to this practice, the focus of 2,711 concrete stelae (“STEE-lee”) of differing heights on a Berlin city block. For 10 points, name this practice that is the focus of Yom HaShoah, a Jewish holiday that commemorates victims of Nazi concentration camps.**

ANSWER: **Holocaust remembrance** [or **Holocaust memorialization** or **Holocaust memory**; or **Holocaust commemoration** until “commemorates” is read; accept **mourning Holocaust victims** or **mourning the Holocaust** (accept word forms in place of “mourning”); prompt on **remembrance** or **commemoration** or **memory** until “commemorates” is read by asking, “Of what?”] (The museum constructed into a hill is located at Yad Vashem.)  
<RR, Other Academic>

2. **J.A.B. Palmer uses the Chroniclers’ Narrative to explain the origins of this group, whose members wore headwear that distinguished themselves from the *yaya*. In a set of namesake legends, the Bektashi Order exaggerated connections to the foundation of this group, who in turn venerated Haji Bektash as a patron saint. Patrona Halil, a member of this group, led a 1730 uprising that ended the (\*) Tulip Period. The Nizam-i Cedid (“jeh-DEED”) reforms marked an attempt to rein in the privileges of this group by Selim III. Mahmud II forced this group to disband in 1826 during the Auspicious Incident. The *devshirme* (“DAYV-sheer-MAY”) system provided kidnapped Christian youths to be trained as these soldiers. For 10 points, name this elite infantry force enlisted by the Ottoman Empire.**

ANSWER: **janissary** corps [or **janissaries** or **yeniceri**; prompt on **Ottoman soldiers** or **Ottoman army** or **Ottoman infantry** until “Ottoman” is read]  
<GP, World History>

3. **A pair of architects from this country randomly placed columns around the living room of one house, echoing the birch trees surrounding it outside. Large sculptures holding spherical “lanterns” stand outside a railway station in this country originally designed in a controversial Romantic style. A reclining chair with a top and bottom curving into loops is sold by Artek and was created for the (\*) Paimio Sanatorium in this country. An architect born in this country designed a hanging sculpture of metal rods and plates cascading from a skylight above an altar, as well as a building shaped like one-eighth of a sphere. A cylindrical brick chapel and Kresge Auditorium were designed by that architect from this country for MIT. For 10 points, Aino and Alvar Aalto worked in what country, where Eliel Saarinen designed a train station for its capital, Helsinki?**

ANSWER: **Finland** [or Republic of **Finland** or **Suomi** or **Suomen** tasavalta or Republiken **Finland**] (The first clue refers to the Villa Mairea.)  
<AY, Other Arts: Architecture>

4. **Jun-ichi Yoshida developed a method for generating a “pool” of these species using low-temperature electrolysis. These species are formed by HF-catalysis and react with alkenes in the alkylation unit process.**

**George Olah isolated these species in a mixture of fluorosulfuric acid and antimony pentafluoride called “magic acid.” The pinacol and Wagner-Meerwein rearrangements proceed through one of these (\*) intermediates. A strong Lewis acid converts an alkyl halide into one of these species in the Friedel-Crafts alkylation, which then electrophilically attacks the ring. These species are stabilized by hyperconjugation and can undergo methyl and hydride shifts. These species are the intermediates in E1 and SN1 reactions. For 10 points, identify these reactive species with a positive charge on carbon.**

ANSWER: carbocations [prompt on cations]

<JZ, Chemistry>

**5. A stage note in this play states that “the solution of one man’s psychological problem” is “not the bird” that this play’s author “hopes to catch.” In a version of this play, a woman shouts, “CRAP,” before her husband tells a lewd story about an elephant. In this play, a sports announcer who hurt his ankle jumping hurdles becomes “peaceful” after finding a (\*) “click” in his head. After discussing “mendacity” with his alcoholic son, a patriarch in this play questions his son about his relationship with Skipper. One woman in this play lies about being pregnant to inherit a plantation from a man with a “spastic colon,” angering Mae. For 10 points, name this Tennessee Williams play in which Brick and Maggie Pollit attend Big Daddy’s birthday party.**

ANSWER: Cat on a Hot Tin Roof

<HG, American Literature>

**6. The first chapter of Alice Crary’s *Inside Ethics* contrasts the “non-cognitivism” of this philosopher with Christine Korsgaard’s Kantian approach. The activist Harriet McBryde Johnson recounts a debate with this philosopher in her essay “Unspeakable Conversations.” This philosopher’s version of the “argument from marginal cases” appears in his 1979 textbook, which controversially claimed that severely (\*) disabled infants should be euthanized. This philosopher draws on Jeremy Bentham’s argument that the capacity to suffer entitles beings to equal moral consideration in a book that popularized the term “speciesism.” This utilitarian imagined a drowning child to argue that donating to charity is a morally immediate obligation. For 10 points, name this contemporary Australian philosopher who wrote *Animal Liberation*.**

ANSWER: Peter Singer [or Peter Albert David Singer]

<VD, Philosophy>

**7. In an action that ran contrary to their beliefs, Quakers were required to swear an oath of loyalty during this period after wine cooper Thomas Venner attempted to summon “King Jesus” at St. Paul’s Cathedral. A former governor of the Massachusetts Bay Colony, Harry Vane, was executed during this period because of his exemption from the Indemnity and Oblivion Act. Many ministers were forced out of their posts during this period in the Great (\*) Ejection for refusing to adhere to the Clarendon Code formulated by Edward Hyde. As recommended by George Monck, the Declaration of Breda smoothed a transition to this period from the Interregnum, which was ended by the deposition of Lord Protector Richard Cromwell. For 10 points, name this period during which the Stuart monarchy was reestablished by Charles II.**

ANSWER: English Restoration [or Stuart Restoration; accept the Restoration of Charles II to the English throne]

<GP, British/Commonwealth History>

**8. Knocking out a “reverse” version of one of these enzymes first isolated from *S. acidocaldarius* increases thermosensitivity in various thermophilic archaeal genera. A lactone-containing class of inhibitors of these enzymes intercalates between bases found in these enzymes’ cleavage complexes. This class of enzymes performs a transesterification reaction using either one or two nucleophilic tyrosine residues to create a “gate.” Inhibitors of these enzymes derived from genus (\*) *Camptotheca* include irinotecan. These enzymes change the linking number by increments of one or two. Helicase-induced torsional strain is alleviated by these enzymes, whose type II class includes DNA gyrase. For 10 points, name this class of enzymes responsible for regulating the topology of DNA.**

ANSWER: **topoisomerases** [accept **topoisomerase I** or **topoisomerase II**; prompt on DNA gyrase or reverse gyrase]

<HK, Biology>

9. **An ensemble that specializes in this genre of music was featured as Joan in Richard Einhorn’s *Voices of Light*. This genre inspired an elegaic canon based entirely on an A minor scale by Arvo Pärt, which he wrote after he spent “years of silence” immersing himself mainly in this genre. Dom Guéranger (“geh-rah-n-ZHAY”) founded a workshop at Solesmes (“soh-LEHM”) that publishes editions of music in this genre with added rhythmic markings. The (\*) *ambitus* and *finalis* differ across music in this genre, which incorporates the *punctum* and the *virga* on a four-line staff. Music in this genre is embellished in *organum*, in which a second voice moves parallel to the *vox principalis*, whose melody is used as the *cantus firmus* in many masses. For 10 points, name this medieval monophonic form of religious song often misattributed to a 6th-century pope.**

ANSWER: Gregorian **chant** [accept **plainchant** or **plainsong**] (The unnamed Arvo Pärt piece is *Cantus in Memoriam Benjamin Britten*.)

<VD, Auditory Arts>

10. **In the aftermath of one of these events, two characters rest under a pomegranate tree and consider leaving for Spain. A Biscayan man who married his godmother is executed to prevent future ones of these events after a man in a cap covered in tailless and clawless devils is flogged to the tune of a sermon. Josephe saves her child from a burning abbey during one of these events before reuniting Jeronimo in a short story set in (\*) Chile and written by Heinrich von Kleist. A philosopher claims that a bay was created so that Jacques the Anabaptist could drown in it during one of these events. The Inquisition’s auto-da-fé held after a historical one of these events results in the unsuccessful hanging of Dr. Pangloss. For 10 points, *Candide* depicts what type of natural disaster that struck Lisbon in 1755?**

ANSWER: **earthquake** [accept *The Earthquake in Chile*; accept the 1755 Lisbon **earthquake**]

<RW, European Literature>

11. **Two answers required. A holder of one of these two positions allegorized his post to the sun and the other post to the moon, claiming that the other merely reflected power and could not independently function. A holder of one of these two positions sent an inflammatory letter to a “false monk,” telling him to “Descend! Descend!” from the other position. Rudolf of Rheinfelden tried to usurp one of these two positions from a monarch who walked (\*) barefoot in the snow for three days to submit to a holder of the other at Matilda of Tuscany’s castle in Canossa. Holders of these two positions balanced spiritual and temporal authority in the Concordat of Worms, ending the Investiture Controversy. For 10 points, a holder of one of what two positions, Leo III, crowned Charlemagne as holder of the other in 800?**

ANSWER: **Holy Roman Emperor** AND **Pope**

<DC, European History>

12. **Several spells for protection against this action invoked the goddess Ta-Bitjet. The Met houses a Magical Stela that depicts Horus standing atop a pair of crocodiles and is inscribed with spells that protect against this action. A creature unable to perform this action was depicted on the head of a goddess with epithets such as “She Who Causes the Throat to Breathe,” symbolizing her protection from this action. After a rich woman refused refuge to a pregnant Isis, (\*) seven of the goddess’s bodyguards performed this action on the woman’s son. Serqet could be invoked to protect against this action. A creature made from dirt and drool performed this action to a god, forcing Ra to reveal his True Name to Isis for healing. For 10 points, name this harmful action performed by snakes and scorpions.**

ANSWER: **poisoning** [accept **stinging** or **biting**; accept **injecting** with **venom** or **envenomation**; accept word forms such as being **poisoned**; prompt on **killing** or **wounding** by asking, “In what manner?”]

<KT/AY, Beliefs>

13. In one poem, an author with this surname described “farther and farther, all the birds” joining a blackbird in singing at the title train station. An author with this surname warned of “the last Samson of your zodiac” in a poem set on “almost the incendiary eve.” A poet with this surname who died at the Battle of Arras was the inspiration for his friend Robert Frost’s poem “The Road Not Taken.” A poet with this surname exclaims, (\*) “I sang in my chains like the sea,” at the end of a poem from the collection *Deaths and Entrances*. That author with this surname described a time “as I was young and easy under the apple boughs” in a poem that notes, “time held me green and dying.” For 10 points, give this surname of the author of “Fern Hill,” who in another poem urges, “do not go gentle into that good night.”

ANSWER: **Thomas** [accept (Philip) Edward **Thomas**; accept Dylan (Marlais) **Thomas**] (The poem in the lead-in is “Adlestrop” by Edward Thomas, and the poem in the second line is “Deaths and Entrances.”)

<HG, British Literature>

14. The Davenport q-method finds one of these transformations that solves Wahba’s problem. This process causes a superconductor to acquire a London moment. This process induces a phase shift in the two beams of light in a ring laser due to the Sagnac effect. Computationally, this process is often performed using quaternion conjugation rather than multiplication by an orthogonal matrix in order to avoid (\*) gimbal lock. Euler, Lagrange, and Kovalevskaya name the three classical rigid bodies undergoing this process that have integrable dynamics. Inertial navigation systems measure acceleration and this motion. Objects undergoing this motion have changing yaw, roll, and pitch, or changing Euler angles. Gyroscopes are used to detect, for 10 points, what motion around a central axis?

ANSWER: **rotation** [accept **spinning**; prompt on **precession** by asking, “What more general motion is precession a consequence of?”]

<VD, Physics>

15. The prophet Muhammad advised spitting over the left shoulder three times in response to some of these events, which, when beneficial, are *ru`yā hasana*. During these events, Shaytān can take any form except that of Muhammad. During one of these events, the stars, sun, and planets prostrated themselves before a boy who was warned against (\*) recounting the experience. In general, the hadīth advises Muslims against recounting these events when they are negative. Birds picked at bread in another of these events that preceded the death of a servant. One man became a vizier after determining that one of these events featuring seven fat and seven skinny cows indicated seven years of plenty followed by seven of famine. For 10 points, name these events interpreted by Yūsuf.

ANSWER: **dreams** [or **visions**; or **nightmares**; accept *hulm* or *’ahlām*; accept *ru`yā* or *ru`an* until “ru`yā” is read]

<HK, Beliefs>

16. A nude figure with this condition sits on a yellow chair in a portrait at the entrance to “People Come First,” the Met’s 2021 Alice Neel exhibition. For Trafalgar Square’s Fourth Plinth, Marc Quinn sculpted disabled artist Alison Lapper with this condition. A skull and three disturbing faces loom behind a figure with this condition in Klimt’s *Hope I*. Based on 3D scans, researchers proposed that the sitter of the (\*) *Mona Lisa* had recently had this condition. Vermeer may have depicted this condition in a painting of a woman in blue reading a letter. Annie Leibovitz took a controversial image for *Vanity Fair* featuring Demi Moore with this condition. For 10 points, Awol Erizku photographed a green-veiled Beyoncé kneeling in front of flowers in a portrait announcing what condition before the birth of her children?

ANSWER: **pregnancy** [accept word forms; prompt on **motherhood**] (The painting in the first clue is *Margaret Evans Pregnant*.)

<AY, Visual Arts>

17. Two answers required. In a short story, one of these countries is called “all give-and-take” by a character from the other, who sends money from one to the other in long brown envelopes. A doctor named Julius, who

**is from one of these two countries, wanders the streets of a city in the other in the novel *Open City*. A character who lives in these two countries works as a “relaxation assistant” for a predatory tennis coach before dating a professor named (\*) Blaine. A woman from one of these countries works as a waitress in the other after her “uncle” molests her in the story “The Thing Around Your Neck.” In a novel, a Princeton fellow who lives in these two countries starts the blog “Raceteenth.” For 10 points, name these two countries, one of which is the birth country of Obinze and Ifemelu in a Chimamanda Ngozi Adichie novel titled for the other.**

ANSWER: **Nigeria** AND **United States** of America [or Federal Republic of **Nigeria** AND United States of **America**; accept **USA** in place of “United States of America”]

<CM, World Literature>

18. *Description acceptable.* **Chemical looping technology efficiently assists this task by recycling a fluidized metal oxide bed to produce a nearly pure product. A Bill Gates-backed plant in Squamish, British Columbia is testing a “direct” method for this task that starts by reacting its target with potassium hydroxide. Ethanol-amine solvents perform this task “post-combustion” by scrubbing hydrogen sulfide and this task’s target from (\*) flue gas. When performed industrially, the result of this task is typically injected into geologic formations as a supercritical fluid. Peatlands perform this task more efficiently than any other sink on Earth. Until emissions are eliminated, this task will be necessary to maintain net-zero. For 10 points, name this task that removes the primary greenhouse gas from the atmosphere.**

ANSWER: **carbon capture** [prompt on scrubbing by asking, “What is being scrubbed?” and accept if they say **CO<sub>2</sub>**, **carbon**, or **carbon dioxide**; accept **direct air capture**; accept **carbon sequestration**, **carbon storage**, or **carbon absorption**; accept **carbon dioxide** or **CO<sub>2</sub>** in place of **carbon**; accept descriptions indicating that **carbon dioxide** is being **captured** or **removed** from the atmosphere]

<VD, Other Science: Environmental Science>

19. **In analyzing vascular surgery during this conflict, Michael DeBakey scorned the proliferation of ligation instead of arterial repair. The receiver operating characteristic curve was devised during this conflict and was used for a device that became practical after the invention of the cavity magnetron during this conflict. A lack of American access to natural sources spurred Woodward and Doering to synthesize (\*) quinine during this conflict. Alvin Weinberg used the term Big Science to describe a style of research project that originated during this conflict. This conflict was the first time that radar was widely used. The development of deep-tank fermentation facilitated the mass production of penicillin during this conflict. For 10 points, name this conflict during which the world’s first self-sustaining nuclear reaction was initiated as part of the Manhattan Project.**

ANSWER: **World War II** [or the **Second World War**]

<GP, American History>

20. **A lecture by Robert Bellah titled for this thinker “and world-denying love” traces an essay by this thinker that proposes a four-type typology of world-rejection, including mysticism and asceticism. This author of “Religious Rejections of the World and their Directions” noted the historical transition away from those who execute the laws owning the means of executing the laws, in a speech that also demeaned (\*) bureaucrats as unfit to be leaders. This thinker classified domination by the “eternal yesterday,” along with legal and charismatic domination, as one of his three types of authority. This thinker used the idea of a monopoly on the legitimate use of physical force as his definition of a state. For 10 points, name this pioneering German sociologist who wrote “Politics as a Vocation.”**

ANSWER: Max **Weber** [or Maximilian Karl Emil **Weber**]

<KJ, Social Science: Sociology>

## Bonuses

1. In Tom Stoppard's *Arcadia*, Thomasina calls Septimus a "cheat" after he mockingly translates a line spoken by this character. For 10 points each:

[10h] Name this character who dies from a broken heart after abandoning his former leader. In a famous passage, this character describes a woman who sits in a barge "like a burnished throne."

ANSWER: Domitius **Enobarbus**

[10m] In that speech, Enobarbus notes of this other character that "age could not wither her, nor custom stale / her infinite variety."

ANSWER: **Cleopatra**

[10e] Enobarbus serves as a lieutenant to this character, the lover of Cleopatra, before betraying him for Octavian on the eve of the Battle of Actium. In *Julius Caesar*, this character delivers the "Friends, Romans, countrymen" oration.

ANSWER: Mark **Antony** [or Marcus **Antonius**]

<JF/HG, British Literature>

2. In a discontinuity in one of these things, the feet and genitals appear adjacent to each other. For 10 points each:

[10m] Name these visualizations. Wilder Penfield used electrical stimulation to create these constructs, which have disproportionately large hands and lips and link sensory and motor functions to specific cortical regions.

ANSWER: **homunculus** [accept motor, sensory, or cortical **homunculus**; accept **topographic maps** or **somatotopic maps**]

[10e] Certain brain regions in owl monkeys expand into adjacent ones and cortical maps reorganize after this operation, showing neuroplasticity. Many patients who underwent this operation suffer from phantom limb pain.

ANSWER: **amputation** [accept word forms]

[10h] This neuroscientist observed that patients could feel a touch applied to their faces on their phantom arms in a proposed reorganization of the sensory cortex. This scientist developed mirror boxes to treat those phantom limbs.

ANSWER: V.S. **Ramachandran** [or Vilayanur Subramanian **Ramachandran**]

<AY, Social Science: Psychology>

3. After the French introduced artichokes to the New World, Thomas Jefferson liked them so much that he used "artichokes" as the key for coded messages to this explorer. For 10 points each:

[10e] Name this explorer whom Jefferson sent to map the Louisiana Purchase with William Clark.

ANSWER: Meriwether **Lewis**

[10m] Artichokes grew in popularity when Italian immigrants began growing them in this state in the 1920s. Filipino activists Larry Itliong and Philip Vera Cruz led a 1965 strike in this state.

ANSWER: **California**

[10h] Gangster Ciro Terranova's monopoly on artichokes led this politician to ban them in 1935. This politician sought to curb racketeering by smashing a pinball machine with a sledgehammer as a media stunt.

ANSWER: Fiorello **La Guardia** [or Fiorello Henry **La Guardia**]

<AS, American History>

4. The third section of one poem describes how this city "of granite, hellish, cherished" has "fallen silent, turned deathly white" and is where its speaker sobs over the "noiselessness of fraternal graves." For 10 points each:

[10m] Name this city. In another poem, a bronze statue chases a grieving young man through the streets of this city.

ANSWER: St. **Petersburg** [or Sankt **Peterburg**] (The first poem is "Poem Without a Hero.")

[10e] Evgenii angers a statue of Peter the Great after a flood of St. Petersburg in *The Bronze Horseman*, a narrative poem by this author. Lensky duels the title character in this poet's verse novel *Eugene Onegin*.

ANSWER: Alexander **Pushkin** [or Aleksandr Sergeyevich **Pushkin**]

[10h] This author ends his poem "Petr" by describing the Bronze Horseman holding a sword outstretched over the city. The image of "Black night. / White snow. / The wind, the wind!" opens this author's poem *The Twelve*.

ANSWER: Alexander **Blok** [or Aleksandr Aleksandrovich **Blok**]  
<CM, European Literature>

5. Saint Faustina's devotional prayer, the Divine Mercy Chaplet, is typically meant to be said at this time "when mercy triumphed over justice." For 10 points each:

[10h] Name this later of the two hours of Mercy that is sometimes referred to as *None* ("NO-nay"). Saint Faustina was advised to perform the Stations of the Cross at this hour, when the Earth shook as Jesus expired on the cross.

ANSWER: **3:00** pm [accept **15:00**; accept **Three** O'Clock Prayer; accept **9th hour** of the day]

[10e] The Three Hours' Agony service is held from noon until three on this holiday, which commemorates Jesus's death two days before Easter Sunday.

ANSWER: **Good Friday** [or **Holy Friday** or **Great Friday** or **Black Friday**]

[10m] Tertullian references Moses and Daniel when arguing that one should perform this practice until sunset, rather than the ninth hour, on station days. Catholics must engage in this practice for at least one hour prior to communion.

ANSWER: **fasting** [accept answers like **abstaining** from food, meat, alcohol, or drink; accept **reducing** one's **food** intake] (The Tertullian work clued is *On Fasting, in opposition to the Psychics*.)

<KT, Beliefs>

6. This book argues that L.A. "could have been the most beautiful city in the world" if businessmen didn't interfere with the architecture after its author sees Frank Lloyd Wright's plans for the Hollywood Bowl. For 10 points each:

[10h] Name this book that began as a letter to the author's father Joaquín. This book recalls the author's affairs with the psychoanalyst Otto Rank and the writer Henry Miller.

ANSWER: **Diary of Anaïs Nin** [accept answers that mention **Nin's diary**]

[10m] Nin likely inspired Tania, who has an affair with the narrator of this Henry Miller novel. George Orwell's essay "Inside the Whale" discusses this "autobiography in the form of a novel" about an expatriate in Paris.

ANSWER: **Tropic of Cancer**

[10e] "Inside the Whale" states that critics cautiously praised *Tropic of Cancer* because they didn't want to appear to enjoy this genre. Nin's *Delta of Venus* is in this genre, which often faces obscenity trials for explicitly depicting sex.

ANSWER: **erotica** [or **erotic** fiction or **pornography**; prompt on **adult** fiction]

<CM, American Literature>

7. An ethnography by Anthony Seeger asks why the Suyá of Brazil do this activity. For 10 points each:

[10e] Name this musical activity, which Kaluli women do in imitation of the weeping of the *muni* bird. West African griots ("GREE-ohs") tell stories by performing this activity accompanied by an instrument.

ANSWER: **singing** [accept *Why Suyá Sing*; prompt on **chanting**]

[10m] Steven Feld's classic analysis of Kaluli song borrows heavily from the structuralist approach of this anthropologist, who compared myth-making to *bricolage* and identified narrative units called *mythemes*.

ANSWER: Claude **Lévi-Strauss**

[10h] Feld released *Voices in the Forest* as one of these recordings. R. Murray Schafer writes that acoustic ecology research should be presented using these composed recordings, and founded a "World Project" to create them.

ANSWER: **soundscape** [accept World **Soundscape** Project]

<VD, Social Science: Anthropology>

8. Franjo ("FRAHN-yo") Tudjman and Slobodan Milošević's encouragement of "long-distance nationalism" following this agreement solidified collective legacies of ethnic cleansing, such as that at Srebrenica ("sreh-BREN-eet-suh"). For 10 points each:

[10m] Name this agreement that ended the Bosnian War by creating a power-sharing framework between the Republika Srpska and the Federation of Bosnia and Herzegovina.

ANSWER: **Dayton** Accords [or **Dayton** Agreement; or **General Framework** Agreement for **Peace** in **Bosnia and Herzegovina**]

[10h] This diplomat was elected President of Finland in 1994 after mediating peace negotiations during the Bosnian War. This diplomat won the 2008 Nobel Peace Prize in part for his development of a namesake plan that recommended “supervised independence” for Kosovo.

ANSWER: Martti **Ahtisaari** [or Martti Oiva Kalevi **Ahtisaari**]

[10e] The fragmentation of this state during the 1990s caused the reemergence of ethnic tensions seen in the Bosnian and Kosovo Wars. Josip Broz Tito navigated this state’s neutral foreign policy through the Cold War.

ANSWER: **Yugoslavia** [or **Jugoslavija** or Federal Republic of **Yugoslavia** or Federativna Republika **Jugoslavija**]  
<GP, European History>

9. A project at this lab is working on automating plutonium-238 production for radioisotope thermal generators to be used in deep space explorers. For 10 points each:

[10m] Name this lab that houses the SUMMIT supercomputer. The Calutron Girls worked at this formerly segregated Tennessee national lab, where uranium isolation and enrichment methods were developed during the Manhattan Project.

ANSWER: **Oak Ridge** National Laboratory

[10h] Oak Ridge now houses the SNS and HFIR, two of the world’s most powerful sources of beams used in this experimental technique. Bulk materials are often probed with this technique due to its high penetration depth.

ANSWER: **neutron scattering** [accept **neutron diffraction** or **neutron spectroscopy**]

[10e] The ORMAK Tokamak at Oak Ridge was the first to achieve a plasma temperature of 20 million Kelvin in 1971, but ultimately failed to create a viable form of *this* type of nuclear energy production.

ANSWER: nuclear **fusion**

<JF, Physics>

10. This composer featured repeating sixteenth notes derived from another composer’s “Shrovetide Fair” in her *Petroushskates*. For 10 points each:

[10h] Name this composer who wrote several works commissioned by the Da Capo Chamber Players, which she helped found. This composer dedicated her first *Fanfare for the Uncommon Woman* to Marin Alsop.

ANSWER: Joan **Tower**

[10m] The Da Capo Chamber Players feature an instrumentation named for this piece, consisting of flute, clarinet, violin, cello, and piano. The preface to this setting of Giraud poems explains its composer’s use of *sprechstimme* (“SPREK-shtim-muh”).

ANSWER: **Pierrot Lunaire** (by Arnold Schoenberg) [prompt on **Pierrot** ensemble]

[10e] Tower’s *Petroushskates* pays homage to this composer, who may have re-orchestrated two of his own *Three Japanese Lyrics* after hearing *Pierrot Lunaire*. A high bassoon solo opens this composer’s *Rite of Spring*.

ANSWER: Igor **Stravinsky** [or Igor Fyodorovich **Stravinsky**]

<AY, Auditory Arts>

11. Fearing a Volscian invasion, the Romans established the mountainous colony of Norba to watch over one of these locations. For 10 points each:

[10h] Name these locations. Although Livy blamed the outcome on the spring weather, conjunctivitis caused one man to lose sight in one eye while leading his forces through one of these locations near the Arno.

ANSWER: **marshes** [accept **swamps**; accept Pontine **marshes** or Pomentinum **marshes** or Pomptine **marshes**; prompt on **plains**] (The man who went blind is Hannibal.)

[10e] To increase agricultural production, this ancient Roman dictator drew up plans to drain the Pontine marshes. This ruler was assassinated on the Ides of March.

ANSWER: Julius **Caesar** [or Gaius Julius **Caesar**]

[10m] The presence of easily defensible swamps convinced Honorius to move the Roman capital to this city.

Theodoric the Great made this city the Ostrogothic capital following a three-year siege.

ANSWER: **Ravenna**



<KT, Ancient History / Archaeology>

12. In one musical's number "Telephone Wire," this character repeats, "At the light," and, "Say something, talk to him!" while she struggles to express herself to her father during a car ride. For 10 points each:

[10m] Name this protagonist of a musical whose events occur out of sequence, simultaneously focusing on her life as a child, as a freshman in college, and as an adult writing that musical's namesake graphic memoir.

ANSWER: **Alison** [accept Alison **Bechdel**; accept Small **Alison** or Medium **Alison**]

[10e] That musical, *Fun Home*, is the first Broadway musical whose protagonist has *this* trait that Alison embraces by "changing [her] major to [...] Joan." *Fun Home* details cartoonist Alison Bechdel's experience with this sexuality.

ANSWER: **lesbianism** [prompt on **homosexuality** or being **gay**]

[10h] Small Alison starts to realize her sexuality in *this* number when she feels a connection with an "old-school butch" deliverywoman in a diner. Jeanine Tesori chose to focus on this number's title object because she thought that it's "where a little girl's eyes would go."

ANSWER: "**Ring of Keys**"

<EG, Other Arts: Opera and Musical Theater>

13. This author's virtuous, perpetually sick character María Clara was inspired by his star-crossed lover Leonor Rivera. For 10 points each:

[10h] Name this author of a novel in which María Clara's lover, Crisostomo Ibarra, is arrested for leading a rebellion with which he had no involvement after he returns to his hometown to start a school.

ANSWER: José **Rizal** [or José Protasio **Rizal** Mercado y Alonso Realonda]

[10e] A villainous member of this religious sect is revealed to be María Clara's real father in Rizal's novel *Noli me tangere*. A whiskey-loving member of this denomination fathers Brigitta in Graham Greene's novel *The Power and the Glory*.

ANSWER: **Catholicism** [or **Catholic** Church; prompt on **Christianity**]

[10m] Rizal wrote the poem "My Last Farewell" just days before dying in this manner. In the opening line of a novel, a man recalls discovering ice with his father while he prepares to die in this way.

ANSWER: execution by **firing squad** [prompt on **execution** or being **shot**] (The unnamed novel is *One Hundred Years of Solitude*.)

<HG, World Literature>

14. The New Madrid Earthquake created many of these features by changing the course of the Mississippi River. For 10 points each:

[10m] Name these lakes that form when the distance between concave banks is reduced to zero, causing the source river to bypass them. As a result, these lakes often dry up and form meander scars.

ANSWER: **oxbow** lakes

[10e] Oxbow lakes are partially caused by this process, in which water and wind break down rock or soil. Unlike in weathering, the material in this process is then transported to another location.

ANSWER: **erosion** [accept physical **erosion** or chemical **erosion**]

[10h] These features below the slip-off slope on the inside of river bends are formed by similar mechanisms to oxbow lakes. The braids of braided rivers are separated by these features.

ANSWER: point **bars** [accept sand **point bars** or **braided bars**; prompt on **deposits**]

<JS, Other Science: Earth Science>

15. The development of a Singaporean app to perform this process according to the PEPP-PT standard has met criticism over the ability of police to request user information. For 10 points each:

[10h] Name this process aided in Kuwait by the app Shlonik. The Kuwaiti government can request live photos from app users to confirm GPS locations transmitted by the app, raising concerns of privacy violations.

ANSWER: COVID-19 **contact tracing**

[10m] The TraceTogether app was developed as part of an initiative described by *this* adjective that intended to create civic tech in Singapore. Mercedes-Benz discontinued an American line of cars described by this adjective that were designed to fit perpendicularly in a parking spot.

ANSWER: **smart** [accept **Smart** Nation; accept **Smart** Cars]

[10e] The “Smart Nation” initiative produced the SingPass, which allows users to access government services via this method of verification that can also unlock newer iPhones using the front camera. Huawei controversially tested using this software to identify Uyghurs.

ANSWER: **facial recognition** [or **face ID** or **facial scan** or **facial identification**]

<AS/GP, Current Events>

16. This thinker argued that all terms describing God in the Bible are either figurative or are homonyms for other words, since any positive description of God is impossible. For 10 points each:

[10m] Name this medieval Jewish theologian whose major philosophical work is framed as a letter to his student, Joseph ben Yehuda. He also wrote the *Mishneh Torah*.

ANSWER: **Maimonides** [or Rabbi **Moshe ben Maimon** or **Rambam**] (The unnamed work is *The Guide for the Perplexed*.)

[10h] Maimonides’s *Guide for the Perplexed* attacks Sa’adia Gaon, a Jewish representative of this discipline, for anthropomorphizing God. This discipline’s practitioners originated an argument whose first premise is that everything that exists must have a cause.

ANSWER: Jewish **kalam**

[10e] The *kalam* cosmological argument is a proof of this position. Thomas Aquinas put forth five proofs of this position, the first two of which argue that the universe needs a “prime” mover and a first cause.

ANSWER: the existence of **God** [accept answers like **God** is real]

<MB, Philosophy>

17. This structure’s relative lack of recombination might explain its steady degeneration. For 10 points each:

[10m] Name this structure, about 30% of which consists of ampliconic sequences. This structure contains eight massive palindromic sequences containing its major coding regions, with the major exception being its *SRY* locus.

ANSWER: **Y** chromosome

[10e] In 2020, Brown and Bachtrog suggested that age-related loosening of Y-chromatin may allow these DNA sequences to “jump,” causing accumulation of deleterious mutations. The Y chromosome contains disproportionately many of these sequences discovered by Barbara McClintock.

ANSWER: **transposons** [or **transposable elements** or **TEs**] (This effect has been coined the “toxic Y effect.”)

[10h] In particular, the density of these elements in the Y chromosome is four times the genomic average. One member of this oldest human lineage of TEs serves as a unique event polymorphism for human haplogroup DE.

ANSWER: **Alu** elements [prompt on **SINEs**]

<HK, Biology>

18. Sétthathirath (“say-tah-TEE-raht”) transported an Emerald example of these objects from Lan Na to Lan Xang (“LAHN sahng”), building the Haw Phra Kaew (“KAY’oh”) to house it. For 10 points each:

[10h] Name these objects. One of these objects dating to the Sukhothai period was covered in terracotta and glass until restorations at Wat Traimit revealed it to be made of gold.

ANSWER: statues of the **Buddha** [or **Buddharūpa** or **Phuttha**; accept Emerald **Buddha** or Golden **Buddha**; prompt on **statues**]

[10m] The Emerald Buddha supposedly appeared after lightning struck one of these buildings in Chiang Rai.

Setthathirath ordered the construction of Pha That Luang (“pah taht loo-AHNG”), a large and golden example of these mound-shaped Buddhist buildings that often house relics.

ANSWER: **stupas** [or **that** or **chedi** or **sathup**]

[10e] To display the Emerald Buddha in Wat Phra Kaew, Rama I and Rama III constructed three sets of decorations based on these time periods, including a “rainy” example characterized by monsoons.

ANSWER: **seasons** [accept rainy **season** or wet **season**; prompt on summer or winter]

<JF/GP, World History>

19. David Evans’s oxazo-lidi-none auxiliaries are often used in reactions with this property, which are critical in pharmaceutical and natural products synthesis. For 10 points each:

[10m] Give this property. Reactions with this property favor the production of either the *R* or *S* isomer over the other, resulting in a net optical rotation.

ANSWER: **asymmetric** [or **enantioselective**; prompt on stereoselective; do not accept or prompt on “stereospecific” or “enantiospecific”]

[10e] William Knowles modified Wilkinson’s catalyst with chiral phosphine ligands in order to develop an asymmetric version of this reaction. This reaction adds the lightest element across a double bond.

ANSWER: **hydrogenation**

[10h] Ryoji Noyori developed an improved asymmetric hydrogenation catalyst using ruthenium complexed to this bidentate ligand. Despite having no stereocenters, this atropisomer is chiral due to sterically restricted rotation.

ANSWER: **BINAP** [or **2,2’-Bis(diphenylphosphino)-1,1’-binaphthyl**]

<JZ, Chemistry>

20. Paul Kaplan argues that this woman, who commissioned portraits by Da Vinci and Titian, and her court painter popularized the visual trope of black women subordinate to a “white European protagonist.” For 10 points each:

[10h] Name this art patron. One of the many black children enslaved in this art patron’s household appears in Corregio’s *Allegory of Virtues*. This woman displayed her collection in a studiolo in Mantua’s Ducal Palace.

ANSWER: **Isabella d’Este** [prompt on d’Este] (The Kaplan essay is “Isabella d’Este and black African women.”)

[10m] This Mantuan court painter exoticized Africans with works like his *Adoration of the Magi*, in which Balthazar wears a leopard-skin turban. This artist also frescoed the ceiling of the Camera degli Sposi.

ANSWER: Andrea **Mantegna**

[10e] Mantegna’s drawing of this scene, likely for Isabella, may be its first depiction with a black servant. In Artemisia Gentileschi’s version of this scene, the maid helps hold down an Assyrian general as he is decapitated.

ANSWER: **Judith** beheading **Holofernes** [accept answers that mention **Judith** AND **Holofernes**]

<AY, Visual Arts>