Packet 11
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Tossups

1. **It's not related to DNA replication, but one protein central to this pathway is ORC1, a cotransporter that may be mutated in patients with HHH syndrome. The enzyme NAGS produces an obligate allosteric activator to the rate-limiting enzymatic reaction in this pathway by acetylating an amino acid. Mitochondrial CPS1 consumes two molecules of ATP to phosphorylate bicarbonate in the first step of this pathway; that enzyme produces (*)** carbamoyl phosphate. An amine transfer from aspartate to citrulline leads to a net production of fumarate in this pathway, which links it to the citric acid cycle. This pathway, which occurs in the liver, sees arginine converted to ornithine in its last step. For 10 points, name this biochemical pathway which disposes of ammonia by producing the namesake nitrogenous waste compound found in urine.
ANSWER: **urea cycle** [or **ornithine cycle** until "ornithine" is read; or **Krebs–Henseleit** cycle; do not accept or prompt on "Krebs cycle"]
<Sam Botterbusch, Biology>

2. **A 2020 government suit charged that 1.3 billion dollars worth of products associated with this industry had been illegally sold by Ripple Labs. A last-minute objection by Senator Richard Shelby stopped a compromise amendment on the legal definition of (*)** "brokers" in this industry from entering the 2021 Senate infrastructure bill. After losing almost 500 million dollars in theft, one of the largest companies in this industry, Mt. Gox ("mount gox") filed for bankruptcy in 2014. Nayib Bukele worked with companies in this industry to introduce a new legal tender in El Salvador. This industry's impact on the energy grid has led many countries to ban its mining activities. For 10 points, Binance and Coinbase are among the largest exchanges in what industry where participants trade altcoins and bitcoin?
ANSWER: **crypto**currency [or **decentralized finance**; or **DeFi**; or **bitcoin**; prompt on finance; prompt on financial technology or fintech; prompt on currency; prompt on banking]
<Nitin Rao, Miscellaneous>

3. **The British Museum houses this artist's Italian Sketchbook, which includes a sketch for a portrait of an elderly Sofonisba Anguissola and was owned by Peter Lely, this artist's artistic successor. After a quarantine in Palermo and time in Genoa, this artist engraved a collection of half-length portraits called *Iconography*. Whitehall's Banqueting House was the planned location of this artist's series on the Order of the Garter, whose sash is worn by the (*)** three identical figures of a portrait this artist created as a model for a bust by Gian-Lorenzo Bernini. A monkey climbs on Sir Jeffrey Hudson in this artist's portrait of Henrietta Maria. A triple portrait and a portrait "at the hunt" that both depict an English monarch were painted by this student of Peter Paul Rubens. For 10 points, name this Flemish portraitist of Charles I.
ANSWER: Anthony **van Dyck**
<Aseem Keyal, Painting>

4. **The preface to this play defends monologues as "natural" with the examples of a child talking to her cat and an old lady chattering to her parrot. The author of this play noted his decisions to stop using footlights and "stop painting shelves and pots and pans" on the stage walls in a preface that describes its male lead as "the beginning of a new species" and analyzes his "awe" of his unseen employer's boots. That preface uses the phrase (*)** "man-hating half woman" to describe this play's title character, who tries to bring her beloved greenfinch on a planned escape to Lake Como, only for it to be decapitated by a valet. For 10 points, Jean gives the title character a razor blade to commit suicide with at the end of what play by August Strindberg?
ANSWER: *Miss Julie* [or *Fröken Julie*]
<Margaret Tebbe, European Literature>

5. **Hitmen from rural parts of this country known as *izinkabi* ("ee-zeen-KA-bee") are frequently used in wars between rival taxi associations. Pimped out Ford Zephyrs inspired the name of a counter-culture in this country, *zef*, exemplified by a rap act led by Ninja and Yolandi Visser. The necessity of supporting extended family is the so-called (*)** "Black Tax" dealt with by this country's "Rainbow Generation." Simon Roche leads this country's Suidlanders, a rural militant group who believe an alleged string of "farm murders" presages a race war. The humanistic philosophy of Ubuntu was popularized by an activist in this country, Bishop Desmond Tutu. Bantustans were created in, for 10 points, what country during its Apartheid period?
ANSWER: **South Africa** [or Republic of **South Africa**]
<Emmett Laurie, World History>

6. **In a poem about this event, the speaker asks "What fierce imaginings their dark souls lit? / Earth! Have they gone into you? / Somewhere they must have gone" and describes how "they left this dead with the older dead, / Stretched at the crossroads." A poem about this event asks, "O what made fatuous sunbeams toil / to break earth's sleep at all?" after opening "Move him into the sun– / Gently its touch awoke him once." Isaac Rosenberg wrote about this (*)** conflict, which is the subject of "Futility" and a poem that ends by describing "each slow dusk as a drawing-down of blinds" and asks "What passing bells for those who die as cattle?" For 10 points, name this war, the subject of "Dulce et decorum est," "Anthem for Doomed Youth," and other poems by Wilfred Owen.
ANSWER: **World War I** [or **WWI**; or the **Great War**]
<Margaret Tebbe, British Literature>

7. *Note to moderator: read the answer carefully.* **Molecules are labeled as hydrophilic or hydrophobic and then assumed to undergo a form of these processes in the biophysical HP model. Donsker's theorem states that the scaling limit of one of these processes is a continuous Gaussian process with stationary independent inputs. Chains with excluded volumes are modeled using a form of these processes that forbids any crossings. These processes are recurrent in two or fewer dimensions by Pólya's theorem. The continuous-time limit of one of these processes is a (*)** Wiener process. In n steps, one of these processes on a d-dimensional grid is expected to travel a distance of "n to the one-half," visiting on the order of "n to the d over 2" points. For 10 points, macroscopic phenomena like diffusion and Brownian motion are modeled with what stochastic processes where an object moves aimlessly along a grid of points?
ANSWER: **random walk**s [accept self-avoiding **random walk**s; accept simple **random walk**s; prompt on walks or self-avoiding walks; prompt on Brownian motion until read by asking "what statistical processes model Brownian motion?"; prompt on Wiener processes by asking "Wiener processes are limiting processes of what other processes?"; prompt on Markov chains or Markov processes; prompt on stochastic processes until "stochastic" is read]
<Jonathen Settle, Physics>

8. **In Matthew 11, Jesus criticizes a group of people by accusing them of calling John the Baptist a demon while the latter performed this action. In a discussion about this practice, Jesus argues that people do not put new wine into old wineskins, nor do people mourn while the bridegroom is with them, but they perform this action when he leaves. People exploit their workers while performing this action according to Isaiah 58:3, inspiring Jesus to argue that people should pour oil on their heads and not neglect their (*)** appearance while performing this action. After being blinded, St. Paul performed this action for three days. The first of Satan's three temptations for Jesus referenced the fact that the latter had been performing this action for 40 days. For 10 points, Jesus discusses his resolve to perform what action by saying that "Man does not live on bread alone"?
ANSWER: **fasting**
<NourEddine Hijazi, Belief>

9. **Rebecca Solnit described how this place was captured using 18-by-22-inch glass "mammoth" plates by Carleton Watkins, who was one-upped by Eadweard Muybridge's "Flying Studio." A photograph of this location is part of a series of silver gelatin prints commissioned by Albert Bender with the made-up word "Parmelian" in its title. Judy Dater captured the photographer Imogen Cunningham stumbling upon a nude Twinka Thiebaud ("tee-BOH") at this location. This place was captured using a (*)** deep-red filter to lower the exposure and create a jet black sky by a photographer standing at a perch called the "Diving Board." The Zone System was developed by a member of f/64 ("f-stop-64") who took High Trips to this location with the Sierra Club. For 10 points, Ansel Adams's photo *Monolith* depicts the Half Dome mountain of what National Park?
ANSWER: **Yosemite** National Park [anti-prompt on Half Dome by asking "what larger place is it in?"; prompt on the Sierra Nevadas or *High Sierras* by asking "what location in the Sierra Nevadas?"; prompt on the Wild West by asking "what specific location was the site of those photographs?"] (The Rebecca Solnit book is *River of Shadows: Eadweard Muybridge and the Technological Wild West*.)
<Aseem Keyal, Other Arts>

10. **The Vrydolak 29 led the opposition to this city's first black mayor during the so-called "Council Wars." This city's police allegedly disappeared people at an off-site detention center in a former Sears, the Homan Square facility. José Cha Cha Jiménez led a Puerto Rican organization centered in this city that allied with the Young Lords. That alliance's name, which was used for (*)** Jesse Jackson's 1984 Presidential Campaign, was the Rainbow Coalition. This city's police collaborated with the FBI on the assassination of Fred Hampton. The police shooting of Laquan Macdonald was covered up by this city's former mayor, Rahm Emmanuel. For 10 points, Barack Obama was a community organizer in what city's South Side?
ANSWER: **Chicago**
<Emmett Laurie, American History>

11. **A critique of this concept by Kevin R. Murphy described it as a "bandwagon" popularized by measurements that are too broad to have any meaning. A test that attempts to measure this concept is based on research by Dr. Reuven Bar-On ("bar OWN") that reports norms across men and women and across four age groups. This concept is negatively correlated with the Big 5 trait of neuroticism and (*)** alexithymia. This measure was popularized after the research of Mayer and Salovey was summarized in a 1995 book by Daniel Goleman. Self-awareness, self-regulation, and social skills are among the traits associated with this measure. For 10 points, name this measure that attempts to quantify how well one deals with the emotions of themselves and others.
ANSWER: **emotional intelligence** [or **emotional quotient**; or **EQ**; or **EI**; prompt on intelligence but not more specific answers like "general intelligence"; do not accept or prompt on "IQ" or "intelligence quotient"]
<Harris Bunker, Social Science>

12. **A string quartet by this composer features a third movement with a six-flat key signature in which the second violinist and violist repeatedly play rapid *sul ponticello* figures. This composer used a nonsense word to describe the small repeated motifs he used in works like his *Capriccio*, whose unusual instrumentation is flute, brass, and left-hand piano. All four movements of this composer's first string quartet are marked "Con moto." This composer's second string quartet was inspired by his extensive correspondence with (*)** Kamila Stösslová. A majestic brass and timpani fanfare opens an orchestral work by this composer that depicts the Queen's Monastery and a town hall in Brno ("BURR-no"). That work by this composer was written for the Sokol Gymnastic Festival. For 10 points, name this Czech composer of the *Glagolitic Mass and Sinfonietta*.
ANSWER: Leoš **Janáček** ("LAY-ohsh YAH-nah-check")
<Michael Yue, Music>

13. **It's not centrosymmetric, but a study by Wukovitz and Yeates predicted that proteins with this property would form crystals with P1 bar symmetry, allowing for easier crystallization. Interaction between neighboring molecules and substances with this property can result in the loss of this property in an effect named for Pfeiffer. Crystals with this property tend to be denser than compounds without it according to a rule by Otto Wallach. It's not chirality, but thalidomide acquires this property *in vivo*, causing it to be (*)** teratogenic. CFNA and Mosher's acid are examples of derivatives used to separate out mixtures with this property in a process called chiral resolution. For 10 points, name this property in which both enantiomers are present in equal amounts in a mixture.
ANSWER: **racemic** [or word forms]
<Paul Lee, Chemistry>

14. **Unique ethnicity labels identify all thirty of the carved soldiers who decorate this man's elevated wall-cut tomb. This man replaced the adopted lion-and-bull type coins of his predecessor with so-called *toxótai*, named for the archers they depicted. The pink granite Shaluf Stele details this ruler's completion of a canal begun by Necho II. Henry Rawlinson enlisted a young boy to produce papier-mâché casts of an image that depicts this man holding a bow and triumphantly (*)** stepping on a usurper. The first ruler to be interred at the Naqsh-e Rostam necropolis, he began the construction of the Apadana palace. Three cuneiform scripts are featured in a carved image, the Behistun Inscription, which attributes this ruler's success after the death of his empire's founder to "the grace of Ahura Mazda." For 10 points, name this "Great" Persian ruler who was succeeded by Xerxes I.
ANSWER: **Darius I** [or **Darius the Great**; prompt on Darius]
<Talia Coopersmith and Deniz Gedik, Other History>

15. **A wannabe opinion columnist in this novel has his articles rejected by an editor who notes that his "doctrines were about three hundred years behind the age." In this novel, the spoiled child Newton throws tantrums "at the illustrious men of Rome" whenever his tutor tries to teach him Latin. A character from this novel with an affinity for German literature speaks to the elderly abolitionist Miss Birdseye before visiting a Civil War memorial with his love interest. This novel ends as the weeping daughter of a (*)** Mesmerist is led through a crowd following her last-minute cancellation of a speaking engagement. In this novel, the conservative southerner Basil Ransome tries to win the hand of the women's rights orator Verena Tarrant against the wishes of his cousin Olive Chancellor. For 10 points, name this Henry James novel titled for residents of a New England city.
ANSWER: The **Bostonians**
<Taylor Harvey, American Literature>

16. **A multiple sequence alignment tool developed by Des Higgins is named for the fact that its first step was to perform this task to make a guide tree with the UPGMA method. Ward's method offers a criterion for hierarchical approaches to this task. A method to perform this task on noisy data defines boundary points as those reachable from core points; that algorithm is (*)** DBSCAN. A method for performing this task switches between updating assignments to particular centroids and updating the centroids themselves. Unlike classification, this technique is usually unsupervised. Lloyd's algorithm implements the *k*-means method of performing this task, which minimizes the variance within the groups it creates. For 10 points, name this kind of task that identifies groups of similar data points in space.
ANSWER: **cluster**ing [or **cluster** analysis; accept **CLUSTAL**; prompt on grouping]
<Shan Kothari, Other Science>

17. **This movement, whose life in "Demented Times" is the subject of a 2017 Karl Sigmund book, included a thinker whose concept of "nomological danglers" was adopted by J. J. C. Smart. With his wife Marie Riedemeister, a member from this movement produced dozens of books in the pictographic Isotype language. A member of this movement differentiated "internal" and "external" existence questions, which, like his account of (*)** analyticity in terms of state-descriptions, was a point of dispute in his debates with W. V. O. Quine. A. J. Ayer's *Language, Truth, and Logic* brought this group's call for the "elimination of metaphysics" to Anglophone readers. Based around meetings led by Moritz Schlick, for 10 points, what group including Herbert Feigl, Otto Neurath ("NOY-rot"), and Rudolf Carnap advocated logical positivism in a European capital city?
ANSWER: **Vienna Circle** [accept **logical positivism** or **logical empiricism** until "group" is read, but prompt after]
<Jordan Brownstein, Philosophy>

18. **A female operative from this country known as "Postman" assisted downed airmen while leading the Comet Line. From 1945 to 1994, a politician from this country was exiled in Spain after founding a fascist party here that was symbolized by a red flag with a black crown. This country's Prime Minister assessed the feasibility of the E.E.C. while heading the 1955 "Spaak Committee." Cardinal van Roey opposed Léon Degrelle's (*)** Rexist Party in this country, where secularizing educational reforms led to the second "School War." The ascension of King Baudouin ended this country's post-World War II "Royal Question." This country's messy withdrawal from a former colony in the 1960s led to the election of Patrice Lumumba, soon replaced by Mobutu Sese Seko. For 10 points, name this country which has flirted with the idea of partitioning Flanders and Wallonia.
ANSWER: **Belgium** [or Kingdom of **Belgium**; or Koninkrijk **België**; or Royaume de **Belgique**]
<Tracy Mirkin, European History>

19. **In a discussion about this deity and Adonis, Plutarch explains how Adonis is related to the Adon ("ah-DOHN"), the Hebrew god, arguing that Jews actually worship this deity. In a desire to crack down on secretive foreign religious activities, a festival honoring the Roman equivalent of this deity was banned by the Senate in 186 BC. Lycurgus of Thrace mistook his son for ivy and pruned his limbs in a fit of insanity after he banned the worship of this deity. It's not Horus, but the book *The Jesus Mysteries* argues that Christianity is a cult stemming from the conflation of this deity with (*)** Osiris. This deity is identified with the Orphic Zagreus who was ripped apart by the Titans. This deity was sewn into his father's thigh after the latter inadvertently killed his mortal mother Semele. The Maenads were followers of, for 10 points, what Greek god of fertility and wine?
ANSWER: **Dionysus**
<NourEddine Hijazi, Belief>

20. **After deciding to perform this action, a character rushes offstage to oil herself, then returns with a bundle and a magazine she gives to a "book-nourished shrimp." In a play titled for this action, a picture of Nebuchadnezzar and a board reading "Christ is the Head" are hung in place of a framed title deed that had fallen down twice in Act 1. In a play titled for this action, Ahab's wife Jezebel brandishes a pistol when Kiguunda refuses to re-perform it. Gathoni proclaims that she will perform this action (*)** "when I want" in that play by Ngugi wa Thiong'o ("GOO-ghee wah TEE-ongo"). The westernized schoolteacher Lakunle defends his refusal to pay a "price" for this action in a play that ends with Sidi and Baroka performing it. For 10 points, Wole Soyinka's *The Lion and the Jewel* depicts what institution for which a "bride price" was once paid?

ANSWER: **marriage** [or **wedding**s; or word forms; accept answers mentioning specific characters; accept *I Will **Marry** When I Want*]

<Jordan Brownstein, World Literature>

Bonuses

1. According to the weak equivalence principle, a body undergoing this type of motion generates trajectories that are independent of the body's composition. For 10 points each:
[10m] Name this type of motion that, in general relativity, a body undergoes as it moves along a geodesic.
ANSWER: **free fall**
[10h] Torsion balances with two masses made of different material were built by this scientist and his team to test the uniqueness of free fall. Those tests carried out under this Hungarian scientist were a critical step in the development of general relativity.
ANSWER: Loránd **Eötvös** ("ut-vush")
[10e] Loose usages of the term "free fall" include this force that acts opposite to a body's motion through a fluid.
ANSWER: **air resistance** [or **drag**; prompt on friction]
<Jonathen Settle, Physics>

2. This thinker analyzed the emotional labor that immigrant women perform in taking on tasks like child-rearing in an essay from her book *Global Woman*. For 10 points each:
[10m] Name this sociologist who coined the term "second shift" and wrote about the "commercialization of human feeling" in her book *The Managed Heart*.
ANSWER: Arlie Russell **Hochschild**
[10h] Hochschild's 2016 book *Strangers in their Own Land* analyzes support for this movement in a polluted bayou region of Louisiana. Kathy Cramer's *The Politics of Resentment* discusses this movement's presence in Wisconsin.
ANSWER: **Tea Party** movement [prompt on populism or conservatism]
[10e] The discounting of the value of "emotional labor" may contribute to this discrepancy, which, as of 2019, could be represented as a ratio of 79 cents per dollar on an unadjusted basis.
ANSWER: gender **wage gap** [or the gender **pay gap**; accept descriptions of "**women earn**ing **less** than men" or the "ratio of **women**'s to **men**'s **earn**ings"]
<Harris Bunker, Social Science>

3. Performers of one instrument use a simple "bounce" variety of this technique that keeps in time with an accompanying *bilma*, or clapstick. For 10 points each:
[10m] Name this breathing technique that allows performers of the Turkish *mey*, Japanese *shakuhachi*, or Chinese *dizi* ("DEE-dzuh") to play long phrases without pause. It was used by Mark Atkins to play a 52-minute-long concerto on his instrument.
ANSWER: **circular** breathing [prompt on breathing until read]
[10e] Performers like Mark Atkins use circular breathing to play a continuous drone on this Australian wind instrument, a very long wood pipe.
ANSWER: **didgeridoo**
[10h] Circular breathing is crucial to the performance of this basic Armenian wind instrument made of apricot wood, closely related to the *zurna* and the *kaval*. This instrument is often accompanied by a second one of them playing a *dam*.
ANSWER: *duduk* [or *tsiranapogh*]
<Michael Yue, Music>

4. Victims of these kinds of events were gathered together at Skyland Mountain and the Ruskin Dam to be killed. For 10 points each:
[10m] Name this kind of event that sometimes involves the placement of a metal implant that can give its recipients cancer.
ANSWER: **alien abduction** [or equivalents]
[10e] In this show, Agents Dana Scully and Fox Mulder investigate reports of alien abductions and other paranormal phenomena.
ANSWER: The _**X-Files**_
[10h] This mysterious man is the main antagonist of _The X-Files_ and is implied to have been responsible for the assassinations of both John F. Kennedy and Martin Luther King.
ANSWER: C. G. B. **Spender** [or **Cancer Man**; or **Cigarette Smoking Man**; or **CSM**]
<Margaret Tebbe, Miscellaneous>

5. During this event, a planned evacuation of black workers was vetoed by LeRoy Percy after the planter class worried the workers might not come back if permitted to leave. For 10 points each:
[10h] Name this event, the worst of its kind in American history and the subject of Bessie Smith's "Backwater Blues."
ANSWER: **Great Mississippi Flood** of 1927
[10e] This soft-spoken President refused to intervene in the flood. He preceded Herbert Hoover in office.
ANSWER: Calvin **Coolidge**
[10m] The exploitative Levee camps built alongside the Mississippi River were investigated by George Schuyler for this organization. Walter White did investigative work in Elaine for this organization.
ANSWER: **NAACP** [or **National Association for the Advancement of Colored People**]
<Emmett Laurie, American History>

6. The author of this novel was blasted on Twitter for getting a manicure of a barbed wire pattern, inspired by this book's cover. For 10 points each:
[10h] Name this 2020 novel by Jeanine Cummins focusing on a Mexican mother and child entering the US to escape cartel violence. This novel was controversially selected for Oprah's Book Club despite accusations of engaging in "brownface" tropes from the Latinx ("latin-x") community.
ANSWER: _**American Dirt**_
[10m] One component of the _American Dirt_ controversy was a misquoted review by Lauren Groff, whose 2018 short story collection is named for this state. Immigrants living in this state are the focus of a Nilo Cruz play in which Juan reads _Anna Karenina_ aloud.
ANSWER: **Florida** (The play is _Anna in the Tropics_.)
[10e] A blurb on the cover of _American Dirt_ compares it to this John Steinbeck novel about the migration of the Joad family during the Dust Bowl.
ANSWER: The _**Grapes of Wrath**_
<Taylor Harvey, American Literature>

7. In the "Author's Apology" that precedes this play, the author discusses accusations that it is indecent and advocated for prostitution. For 10 points each:
[10m] Name this play in which Vivie exclaims "I don't want a mother; and I don't want a husband" in a climactic confrontation with her mother, who is revealed to have made her money operating brothels.
ANSWER: ***Mrs. Warren's Profession***
[10e] This author wrote about the "New Woman" Vivie Warren in *Mrs. Warren's Profession*. He also wrote *Pygmalion*.
ANSWER: George Bernard **Shaw**
[10h] Shaw explored the "New Woman" archetype in *Mrs. Warren's Profession*, *Widowers's Houses*, and *The Philanderers*, a trilogy that he grouped under this name. This sequence was followed by a trilogy featuring *Arms and the Man*, then his "Plays for Puritans."
ANSWER: the "Plays **Unpleasant**"
<Margaret Tebbe, British Literature>

8. The longstanding problem of why this region is so much hotter than the Sun's surface inspired Hannes Alfvén's ("all-VANE's") work in developing magnetohydrodynamics. For 10 points each:
[10e] Name this halo of plasma that forms the outer atmosphere of the Sun and other stars.
ANSWER: **corona**
[10h] Like most solar system plasmas, the corona has extremely high values for this dimensionless ratio used in magnetohydrodynamics, which makes the observed speed of magnetic reconnection rather puzzling. This ratio is very low for highly resistive plasmas.
ANSWER: **magnetic Reynolds** number [or **Lundquist** number]
[10m] The luminosity of a blackbody is proportional to this power of the effective temperature according to the Stefan–Boltzmann law, which can be used to approximate the surface temperature of the Sun.
ANSWER: **four**th power [or **4**th power]
<Shan Kothari, Other Science>

9. Despite being "the greatest generalization achieved by the human mind," one of this thinker's principles is argued to be a "*ceteris paribus* law" in Nancy Cartwright's *How the Laws of Physics Lie*. For 10 points each:
[10e] Name this thinker who proposed the law of universal gravitation in the 1687 book *Principia Mathematica*.
ANSWER: Isaac **Newton**
[10h] This thinker attempted to work out the metaphysical, causal underpinnings of Newton's laws of attraction in *The Foundations of Physics*. She died shortly after completing her translation of *Principia Mathematica*.
ANSWER: Emilie du **Châtelet**
[10m] Châtelet's *The Foundations of Physics* argues that all knowledge is founded on the principle of contradiction and this principle credited to Gottfried Leibniz, which holds that everything must have a cause for existing.
ANSWER: principle of **sufficient reason** [or **PSR**]
<Jordan Brownstein, Philosophy>

10. In 1897, this woman moved to Java, where her brief marriage to the abusive army captain Rudolph MacLeod ended shortly after the death of their young son Norman, possibly poisoned by a housekeeper. For 10 points each:
[10m] Name this woman, known as "H-21" in official relays, but better known by a name meaning "eye of the day." Her services were recruited by Georges Ladoux, who would later tamper with evidence presented during her trial.
ANSWER: **Mata Hari** [accept Margaretha Geertruida **Zelle**; prompt on Margaretha Geertruida MacLeod]
[10e] Mata Hari's execution for espionage during WWI was likely done to produce a scapegoat for this country's recent military losses in 1917, which heralded the formation of its hawkish ministry under Georges Clemenceau.
ANSWER: **France** [or **French** Republic; accept *République française*]
[10h] During World War I, the "Queen of Spies" Louise de Bettignies spied on the Germans for the British while leading this spy ring out of Lille, which took its name from her choice of pseudonym, which had the surname "Dubois."
ANSWER: the **Alice** Network [accept the **Alice** Ring, or any other answer mentioning **Alice**]
<Tracy Mirkin, European History>

11. Leonardo wrote several treatises in preparation for a colossal sculpture depicting this artistic subject; that sculpture was never completed after the seventy tons of bronze needed were used to build cannons instead. For 10 points each:
[10h] Name this artistic subject, several of which were also depicted in a painting called "The Lost Leonardo." That painting featuring several of these subjects was accidentally melted after charcoal stoves were used to try to dry it.
ANSWER: **horse**s [or **equestrian** art; prompt on riders or soldiers by asking "what animal are they riding?"; prompt on battles or fights by asking "what creatures are involved in the fight?"] (The painting is Leonardo da Vinci's *The Battle of Anghiari*.)
[10e] Leonardo's unrealized horse sculpture was abandoned in favor of defending this city against a siege by Charles VIII. The horse was intended for this city's ruler Ludovico Sforza, who also patronized Leonardo's *The Last Supper*.
ANSWER: **Milan**, Italy
[10m] Leonardo's Milan period produced the two versions of this painting. Both the Louvre and the British National Gallery version show the angel Uriel and John the Baptist as part of a triangular composition in the title setting.
ANSWER: *Virgin of the Rocks* [or *Madonna of the Rocks*; accept anything with **Virgin** or **Madonna** and **rocks**]
<Aseem Keyal, Painting>

12. The protagonist of this story is locked in a crystal bottle by the archivist Lindhorst after he accidentally spills ink while copying a manuscript. For 10 points each:
[10h] Name this short story in which a lily emerges from the title object after Anselmus marries Serpentina.
ANSWER: The *Golden Pot* [or *Der goldne Topf*]
[10e] The subtitle of E.T.A. Hoffman's "The Golden Pot" identifies it as a "modern" work of this type. Other German examples of these stories include "The Brave Little Tailor" and "Hansel and Gretel."
ANSWER: **fairy tale**s [or *märchen*; prompt on folk tales or folklore]
[10m] Charles Dickens reused a scene from "The Golden Pot" in which Anselmus's doorknocker transforms into an old woman who sells these objects. In Kafka's *The Metamorphosis*, Gregor dies after one of these objects thrown by his father gets lodged in his back.
ANSWER: **apple**s [or *apfel*; prompt on fruit]
<Margaret Tebbe, European Literature>

13. Huitzilopochtli ("weet-SEE-luh-poach-tlee") killed his sister Coyolxauhqui ("koh-yohl-SHAO-kee") and consumed one of these objects belonging to her, leading to the tradition of them being removed from captives at a temple to her. For 10 points each:
[10m] Identify these body parts. One of these objects belonging to Quetzalcoatl ("ket-zal-ko-AH-tull") became the Morning Star after he killed himself.
ANSWER: **heart**s
[10e] A cactus grew from the heart of Huitzilopochtli's nephew Copil and later served as the cactus where an eagle ate one of these animals. Quetzlcoatl's name means a "feathered" one of these animals.
ANSWER: **serpent**s [or **snake**s; accept feathered **serpent**]
[10h] People would dress like this "flayed" god before having their hearts removed and their skin worn by others. He was known as Red Tezcatlipoca ("tez-CAT-lee-poke-uh").
ANSWER: **Xipe Totec**
<NourEddine Hijazi, Belief>

14. The Simmons–Smith reaction produces a ring with this many atoms. For 10 points each:
[10e] Name this number of carbon atoms in a cyclopropane ring, the smallest possible number of carbons in a cycloalkane.
ANSWER: **three**
[10m] In the Simmons–Smith reaction, the carbon from diiodomethane ("dy-eye-oh-doh-methane") reacts like one of these molecules. These molecules contain a carbon atom with no net charge and with two unshared valence electrons.
ANSWER: **carbene**s
[10h] Cyclopropane was originally produced through this reaction, in which sodium metal is reacted with an alkyl halide to produce a carbon–carbon bond. A variant of this reaction is partially named for Fittig and works with aryl halides.
ANSWER: **Wurtz** reaction [accept **Wurtz–Fittig** reaction]
<Sam Botterbusch, Chemistry>

15. Nala demonstrates his expertise in this activity by instantly counting the 2,195 nuts on a *vibhitaka* tree. For 10 points each:
[10m] Name this activity. In another scene of the *Mahabaratta*, *vibhitaka* nuts are used in a contest of this activity that results in Yudhishthira losing his kingdom to the Kauravas.
ANSWER: game of **dice** [prompt on gambling]
[10h] The speaker describes how "trembling" dice made from *vibhitaka* nuts "intoxicate me" in the "Gambler's Lament," a poem from this book. Wendy Doniger's translation of selections from this book includes a naturalistic poem titled "The Frogs."
ANSWER: the **_Rigveda_** [prompt on the vedas]
[10e] The "Gambler's Lament" is a secular *sūkta*, one of the poems of this type that make up the *Rigveda*. "Amazing Grace" is an English language example of these typically religious songs.
ANSWER: **hymn**s
<Jordan Brownstein, World Literature>

16. This leader organized a punctuality contest in his country whose grand prize, a 60-thousand-dollar villa, was won by a man nicknamed "Mr. White Man's Time." For 10 points each:
[10h] Name this former President of the Ivory Coast who was acquitted by the ICC alongside Charles Blé Goudé.
ANSWER: Laurent **Gbagbo**
[10e] Ouattara began as an economist for this organization, which helped install him as part of the Ivory Coast's Structural Adjustment Program. Along with the World Bank, this institution was created at the Bretton Woods Conference.
ANSWER: **International Monetary Fund** [or **IMF**]
[10m] Côte d'Ivoire is also home to the headquarters of the African Development Bank, which began after a conference in this country. In 2020, this country overthrew its longtime president after riots began on the anniversary of the 1985 ousting of its president Gaafar Nimeiry.
ANSWER: **Sudan**
<Emmett Laurie, World History>

17. This opera features the aria "Son lo spirito che nega sempre," at the end of which the title character puts his fingers in his mouth and loudly whistles along to the strings' concluding melody. For 10 points each:
[10h] Name this Italian opera written after the success of a similar opera by Charles Gounod. A 2000 Robert Carsen production of this Arrigo Boito opera was revived by the Met in 2018.
ANSWER: *Mefistofele*
[10e] Arrigo Boito is better known as the lyricist to operas like *Simon Boccanegra* and *Falstaff* by this composer. This composer also wrote *La Traviata*.
ANSWER: Giuseppe **Verdi**
[10m] 12 years after his supposed retirement, Verdi was finally persuaded by Boito to write this opera, whose title character first enters with the aria "Esultate." It is Verdi's most popular opera based on a Shakespeare tragedy.
ANSWER: *Otello*
<Michael Yue, Other Arts>

18. The Aramaic term Ramsha denotes an evening service beginning at 6:00 p.m. for Syriac Christians, which is an Eastern analogue of these services. For 10 points each:
[10h] Identify these evening services in the Liturgy of the Hours, notable for its use of the Magnificat hymn during the Psalmody.
ANSWER: **Vespers** [accept **Great**, **Daily**, or **Small** **Vespers**]
[10e] The Vespers, Matins, and the First Hour are performed together overnight during a vigil where these objects are praised for their "Gladsome Light." Vigils in remembrance of the dead feature people holding these objects overnight.
ANSWER: **candle**s
[10m] An All Night Vigil beginning on Halloween extends into this holy day of obligation. The Day of the Dead celebrations are held on this day. Give the name of the feast, not the calendar date.
ANSWER: **All Saints' Day** [or **All Hallows' Day**; or **Feast of All Saints**; or **Solemnity of All Saints**]
<NourEddine Hijazi, Belief>

19. Samuel Johnson defensively declared that "patriotism is the last refuge of a scoundrel" in the aftermath of this event, which Horace Walpole stated was centered on a "morsel of rock." For 10 points each:
[10h] Name this brief diplomatic snafu that resulted from Francisco Bucareli's capture of Port Egmont. Louis XV's dismissal of the militant Duc de Choiseul during this event buttressed the contemporary idea of French timidity.
ANSWER: **Falklands Crisis** of 1770 [accept the **Spanish** capture of the **Falkland**s; prompt on the capture of the Falkland Islands from Great Britain]
[10m] The Falklands Crisis was an early success for this Tory's ministry, which delegated military affairs to George Germain and the 4th Earl of Sandwich. Supposedly, this PM declared "Oh God! It is all over" after receiving news of a crushing defeat.
ANSWER: Lord **North** [accept Frederick **North**, **2nd Earl of Guilford**; prompt on the Earl of Guilford] (That defeat was Yorktown.)
[10e] Following the fall of his ministry, North formed a coalition with Charles James Fox, which did little other than signing this treaty that officially ended the American Revolutionary War.
ANSWER: Treaty of **Paris** (1783) [accept The **Definitive Treaty of Peace Between the Kingdom of Great Britain and the United States of America**]
<Tracy Mirkin, Other History>

20. Barbara McClintock first described how these genetic sequences cause color patterning in maize. For 10 points each:
[10e] Name this kind of DNA sequence that can change its position or replicate itself within the genome.
ANSWER: **transposon**s [or **transposable** elements; or **jumping gene**s]
[10h] Margaret Kidwell showed that in *Drosophila*, this class of transposons causes hybrid dysgenesis in crosses between wild males and lab-raised females. Gerald Rubin and Allan Spradling developed techniques to transform *Drosophila* with these transposons.
ANSWER: **P element**s
[10m] One consequence of P element hybrid dysgenesis is an increase in this parameter, which can cause genome instability. The Luria–Delbrück experiment aimed to show that short-term selective pressures do not increase this parameter, and estimated its value in *E. coli* as 2.45 times 10-to-the-negative-8th.
ANSWER: **mutation rate** [prompt on mu]
<Shan Kothari, Biology>