

**2021 ACF Fall**

**Packet F by NYU B, UNC A**

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Tossups

1. One character in this work passed through five keeps and slew six generals in order to return to his liege while escaping from an opposing commander who had gifted him the Red Hare horse in order to sway his allegiances. A commander in this work is tricked into chain linking his ships together, causing him to suffer an epic defeat at the battle of Red Cliffs. In this novel, Cao Cao ("t'sao t'sao") narrowly escapes with his life due to the mercy of Guan Yu, whom he had earlier recruited. For 10 points, the conflict between states such as Wei and Shu appears in what novel that dramatizes a period of Chinese history after the Han dynasty?

ANSWER: ***Romance of the Three Kingdoms*** [or ***Sānguó Yǎnyì***]

<World/Other Literature>

2. One famous action by this leader was instigated by a remark from Filipino diplomat Lorenzo Sumulong criticizing his country. This leader, who was later targeted in a coup by his former mentor Lazar Kaganovich and the Anti-Party group, ascended to power by outmaneuvering Georgy Malenkov. This leader initiated the failed Virgin Lands campaign in Kazakhstan, and is remembered for declaring "we will bury you" and banging his shoe on the table while giving a speech at the United Nations. For 10 points, name this successor to Joseph Stalin who led the Soviet Union during the Cuban Missile Crisis.

ANSWER: Nikita **Khrushchev**

<European History>

3. Margaret Koster used the presence of a small carving of a monster in this painting to argue that one of its figures is dead. In its central background, this painting depicts an object containing ten small medallions depicting scenes from the Passion of Jesus. That object in this painting is a convex mirror which reflects two people wearing red and blue standing in a door frame. A set of clogs and a fluffy brown dog are shown in front of the two main figures of this painting, one of whom wears a fur hat while holding the hand of a woman in a green, floor length dress. For 10 points, name this painting depicting the namesake Italian merchant and his wife by Jan van Eyck.

ANSWER: ***The Arnolfini Portrait*** [accept ***The Arnolfini Wedding***; accept ***The Arnolfini Marriage***]

<Painting/Sculpture>

4. Einstein's heat capacity model treats every atom as one of these systems. A series RLC circuit acts as one of these systems with zeta proportional to the square root of quantity capacitance over inductance. One of these systems subject to a constant external force is called "driven." If these systems'  $Q$ -factor is one-half, they are said to be "critically damped." The second derivative of one type of these systems' position coordinate equals negative their position coordinate times a constant. Pendulums may be modelled as these systems using the small-angle approximation. For 10 points, name these systems that obey Hooke's law and are exemplified by springs.

ANSWER: **harmonic oscillator** [accept driven **harmonic oscillator** or damped **harmonic oscillator** or simple **harmonic oscillator** or **SHO** or quantum **harmonic oscillator** or **QHO**, prompt on **oscillator**]

<Physics>

5. Members of this religion practice silent birth, in which people giving birth are placed in soundless environments. The 8 points of one symbol of this religion represent the 8 dynamics of this religion, including the Supreme Being, the physical universe, and reproduction. This religion's current head founded the Religious Technology Center, which polices members of this religion to ensure adherence to Orthodoxy. Individuals who blaspheme against this religion are labelled "squirrels" and targeted, while faithful adherents strive to reach the Clear state through rigorous auditing. For 10 points, name this religion whose central myth centers on Xenu and was created by L. Ron Hubbard.

ANSWER: The Church of **Scientology**

<Religion>

6. One culture in modern-day Vietnam used this material to craft the Dong Son drums. This material was used to create cauldrons called *dings* that were often adorned with *taotie* motifs during the Shang dynasty. An 1897 British expedition looted many objects made from this material created in the Kingdom of Benin. The lost-wax method was used to make objects out of this material. The invasion of the Sea Peoples during a collapse named for this material's namesake age, which saw the fall of the Mycenaean and Hittite civilizations. For 10 points, name this material that names the Age between the Stone and Iron Age, an alloy of tin and copper.

ANSWER: **bronze** [accept the **Bronze** Age]

<Other History>

7. A character in an opera by this composer sings "I used to be a teacher many years ago, and now I'm here to learn from you" after being gifted a small model elephant. At the end of Act I of one of this composer's operas, the title character sings the aria "batter my heart, three-person'd god." That opera by this composer uses the *Bhagavad Gita* in its libretto and depicts the life of Robert Oppenheimer. In another opera by this composer, the title character views a performance of *The Red Detachment of Women* as guests of the wife of Mao Zedong. For 10 points, name this American composer of the operas *Doctor Atomic* and *Nixon in China*.

ANSWER: John Coolidge **Adams**

<Other Fine Arts>

8. This poet described the "pure contralto sings in the organ loft" in a poem that also commands "Unscrew the locks from the doors!" In the same poem, this poet described a friendly group joined by a "twenty-ninth bather." This poet described a substance as "the handkerchief of the Lord" before calling it "the beautiful uncut hair of graves." The speaker of a poem by this author "shall mourn with ever-returning spring" and states "the great star early droop'd in the western sky." A poem by this author opens "I celebrate myself, and sing myself." For 10 points, name this poet who included "When Lilacs Last in the Dooryard Bloom'd" and "Song of Myself" in his collection *Leaves of Grass*.

ANSWER: Walt **Whitman**

<US Literature>

9. This is the heavier of two heteroatoms in beta-mercaptoethanol ("mur-CAP-to-eth-uh-nawl"), which is used to reduce bonds between this element to denature proteins for gel electrophoresis. Ferredoxins are clusters of iron and this element that serve as electron carriers in some biological redox reactions. The tertiary structure of proteins is stabilized by bonds between two atoms of this element that form from two cysteine residues. Four atoms of oxygen and one atom of this element are found in a diprotic strong acid found in acid rain. For 10 points, name this element with atomic number 16, which when bound to two hydrogens is responsible for the odor of rotten eggs.

ANSWER: **sulfur** [or **S**; accept iron-**sulfur** complexes or **disulfide** bonds or **sulfuric** acid]

<Chemistry>

10. A concept this thinker called "positive" rather than "negative" use of power was refined in Achille Mbembe's *Necropolitics*. In his early career, this thinker used the term "archaeology" to denote his form of gathering studies on a certain subject, such as his analysis of an "epistemic change" in which empiricism informed the creation of clinical medicine. Building on a concept created by Jeremy Bentham, this author described an "unequal gaze" in a power dynamic between a guard who can see all prisoners in a building called a "panopticon." For 10 points, name this author of *The Birth of the Clinic* who studied the "birth of the prison" in *Discipline and Punish*.

ANSWER: Michel **Foucault**

<Philosophy>

11. A performer *born* with this surname received a namesake instructional notebook for keyboard and wrote several lost compositions after being forced to give up playing at age 18. A composer with this surname wrote a "Toy Symphony" and an influential treatise on violin playing. A different composer with this surname was able to transcribe Allegri's *Miserere* at the Sistine Chapel after hearing it played once. That composer with this surname entertained the courts of France, England, and Austria on several European tours he took with his sister. For 10 points, give this surname shared by the composer Leopold and his prodigy children, Nannerl and Wolfgang.

ANSWER: **Mozart** [accept Wolfgang Amadeus **Mozart** or Leopold **Mozart** or Nannerl **Mozart** or Anna Maria **Mozart**]

<Classical Music>

12. A leader of this tribe apocryphally stabbed his knife through a treaty which replaced the earlier Treaty of Fort Moultrie. Thomas Jesup used a false white flag to capture a leader of this tribe. One war with this tribe was instigated by the Dade massacre. Spain temporarily called off negotiations over the Adams-Onís Treaty after Andrew Jackson instigated an earlier war with this tribe. This tribe's refusal to sign the Treaty of Payne's Landing led to a war with the U.S where they were led by Osceola. For 10 points, name this Native American tribe that fought three namesake wars against the U.S in Florida.

ANSWER: **Seminole**

<US History>

13. It's not the solar wind, but substorms that occur in this entity are studied by the THEMIS satellites. The declination of this entity is constant at isogonic lines. The *K*-index quantifies horizontal disturbances in this entity, which may result in changes in the size of the F layer. Energetic particles captured by this entity reside in the two Van Allen belts. According to one theory, this entity is created by eddy currents in the liquid iron and nickel in the outer core. Stripes created by seafloor spreading at mid-ocean ridges occur because this entity reverses its polarity over time. For 10 points, on Earth a compass needle points towards what entity's north pole?

ANSWER: **Earth's magnetic field** [or the **geomagnetic field** or **geomagnetosphere**; accept **magnetic field** after "Earth" is read, prompt on **ionosphere** by asking "what phenomenon created the ionosphere?" prompt on **magnetic field** by asking "which magnetic field?"]

<Other Science>

14. This country is home to popular tourist routes such as the Golden and Diamond Circle. The Westman Islands are located off the southern coast of this country, which is home to a fermented shark dish known as *hákarl* ("HOW-kartl"). The Dettifoss waterfall is located in this country, whose island of Surtsey was formed from a 1963 volcanic eruption. Thingvellir ("THINK-vet-leer") National Park in this country is the original site of the world's oldest surviving parliament, Althing. Flights departing from this country's Keflavik airport were grounded by the eruption of its Eyjafjallajökull ("ay-uff-YAHT-lah-YOH-kut-ul") volcano. For 10 points, name this European island nation with its capital at Reykjavik.

ANSWER: **Iceland**

<Geography>

15. The speaker of a poem in this form blames himself for thinking that "Death could not take a goddess." Another poem in this form describes the speaker's shame from "the clearest knowledge of how the world's delight is a brief dream." A collection mostly of poems in this form addresses a woman who the author met on Good Friday and begins "you who hear the sound in scattered rhyme." Poems in this form contain a "volta" which marks a shift in their tone. *Il Canzoniere* contains hundreds of poems in this form dedicated to Laura. For 10 points, name this form of poetry, whose Italian form is named after Petrarch and has fourteen lines.

ANSWER: **sonnet**

<European Literature>

16. The protagonist of this work is allowed to marry his wife after he accidentally breaks a divine bow. That wife was discovered as a baby inside the furrow left by a plow. In this text, Nala and Nila use stones inscribed with the protagonist's name to create a floating bridge. One character in this text proves his devotion to his friends by ripping open his chest. That character had earlier used his tail to set fire to a city. To distract the protagonist of this work, Maricha ("mah-REE-chah") turns into a golden deer. This text's hero journeys to the island of Lanka to rescue his wife Sita from the demon Ravana. For 10 points, name this Sanskrit epic about the namesake avatar of Vishnu.

ANSWER: **Ramayana**

<Mythology>

17. Derivatives of a function describing an "indirect" form of this quantity are related to the demand function by Roy's identity. Actors are identified as risk-averse or risk-loving depending on whether a function representing this quantity is convex or concave. Points on an indifference curve all have equal values of this quantity. The consumer surplus is the amount of this quantity gained by a consumer minus the price of the item bought. Rational consumer choice theory assumes that consumers maximize this quantity for a given budget. For 10 points, identify this quantity describing the satisfaction a consumer receives from a product, often described in its "marginal" form.

ANSWER: **utility** [accept **marginal utility**]

<Social Science>

18. This author stayed with the Brooker family to write a misleadingly titled non-fiction book detailing the poor working conditions and lifestyles of a community of miners. In a novel by this author, a glass paperweight with coral inside is broken after a voice appears from behind a picture of St. Clement's church. This author of *The Road to Wigan Pier* wrote a novel in which the protagonist yells "Tear her face off" in response to the threat of two rats eating his head. In that novel, the protagonist first sees his eventual lover Julia during the 2 Minutes of Hate in the Ministry of Truth. For 10 points, name this author who wrote about Winston Smith's struggles against Big Brother in *1984*.

ANSWER: George **Orwell** [accept Eric Arthur **Blair**]

<British Literature>

19. A politician with this surname notoriously worked with José López Rega, who led the Triple A death squad during that politician's tenure in office. A different politician with this surname met with Pope Pius XII and was accused of stashing Nazi gold in Swiss banks during a "Rainbow Tour" of Europe. Left-wing supporters of a politician with this surname called the Montoneros were attacked by snipers while greeting that politician in the Ezeiza Massacre. That politician with this surname was supported by the "descamisados" and was succeeded as president by his wife Isabel. For 10 points, give this surname of Argentine president Juan and his wife, former actress Eva?

ANSWER: **Perón** [accept Juan **Perón** or Eva **Perón** or Isabel **Perón**; prompt on **Duarte** with "what was her married name?"]

<World History>

20. These cells are fused with myeloma cells in hybridoma technology. FDCs are found in the germinal centers where these cells develop. Class switching can change a class of proteins these cells produce from their pentameric to their monomeric isotype; those proteins produced by these cells undergo V(D)J recombination to increase their diversity. CD20 is used as a marker for these cells. In birds, these cells mature in the bursa of Fabricius, while in humans, they mature in the bone marrow. For 10 points, name these white blood cells that secrete antibodies in response to infection, contrasted with T cells.

ANSWER: **B** cells [or **B** lymphocytes, accept **plasma cells**, prompt on lymphocytes, leukocytes, memory cells, or white blood cells]

<Biology>

## Bonuses

1. Bernie Sanders broke from Barack Obama and Hillary Clinton to endorse this politician's party in a September 2021 snap election. For 10 points each:

[H] Name this current leader of the New Democratic Party. During the 2021 election, this politician criticized his country's current Prime Minister for insufficiently distinguishing himself from Conservative leader Erin O'Toole.

ANSWER: Jagmeet **Singh** [accept Jagmeet **Singh** Jimmy Dhaliwal; accept Jagmeet Singh Jimmy **Dhaliwal**]

[E] Singh's leadership of the New Democratic Party marked the first time that a major Canadian party was led by a politician of this ethnicity. The first Canadians of this ethnicity were mainly Sikh immigrants from Punjab.

ANSWER: **Indian**-Canadian [accept **Indo**-Canadian; accept **South Asian** Canadian; accept **Desi**; prompt on **Asian** Canadian]

[M] In the 2019 elections, Singh's New Democratic Party lost most of its seats in this province to a regionalist "Bloc." This province has allowed for a ban on religious clothing such as *niqabs* and turbans.

ANSWER: **Quebec** [accept the Bloc **Québécois**]

<Current Events>

2. Fitch's algorithm may be used in the construction of these entities. For 10 points each:

[M] Name these branching diagrams that show evolutionary relationships between organisms.

ANSWER: **phylogenetic trees** [or **evolutionary trees** or **phylogenies**; prompt on **trees**; accept but DO NOT REVEAL **cladograms**]

[H] Insects appear on phylogenetic trees as this type of group. These groups all share a common ancestor and contain all of that ancestor's descendants.

ANSWER: **clades** [accept **monophyletic** groups; accept **holophyletic** groups]

[E] Another example of a clade is this group of organisms, which dominated the Jurassic and Cretaceous periods. Triceratops is a bird-hipped one of these organisms.

ANSWER: **dinosaurs** [or **Dinosauria**]

<Biology>

3. The losing side in this battle was led by Robert Heriot Barclay. For 10 points each:

[M] Name this battle that saw Oliver Hazard Perry defeat a British fleet near Put-In-Bay. Perry famously wrote to William Henry Harrison that "We have met the enemy and they are ours" after this battle.

ANSWER: Battle of **Lake Erie** [or Battle of **Put-In-Bay**]

[E] The Battle of Lake Erie took place during this war between the United States and Britain. British troops burned Washington, D. C. during this war whose Battle of New Orleans took place after the Treaty of Ghent was signed.

ANSWER: War of **1812**

[H] Perry had a navy blue flag with this five-word phrase flying above the USS *Niagara* in the Battle of Lake Erie. Perry reportedly took this phrase from Captain James Lawrence's dying command aboard the USS *Chesapeake*.

ANSWER: "**Don't Give up the Ship**"

<American History>

4. An offshoot of this artistic movement led by Rosso Fiorentino was named for its center in the court at Fontainebleau. For 10 points each:

[M] Name this artistic movement that succeeded the High Renaissance. This movement's focus on elongated and disproportionate figures can be seen in the work of painters like Il Bronzino and Parmigianino.

ANSWER: **Mannerism**

[E] Parmigianino created a portrait of this figure "with the long neck" where she holds a massive child representing her son Jesus.

ANSWER: **Madonna** [or **Mary**]

[H] This early Mannerist painter showed Mary and Jesus standing on a pedestal flanked by cherubs in his painting *Madonna of the Harpies*. This artist may have depicted himself in a *Portrait of a Sculptor* with a blue sleeve.

ANSWER: **Andrea del Sarto** [accept either underlined part]

<Painting/Sculpture>

5. This author opened one poem by telling readers, "As you set out for [the title place] / hope your road is a long one, / full of adventure, full of discovery." For 10 points each:

[H] Name this poet of "Ithaka" who calls the title people a "kind of solution" in his poem "Waiting for the Barbarians."

ANSWER: Constantine P. **Cavafy** [or Constantine Peter **Cavafy**; or C.P. **Cavafy**; or Konstantinos Petrou **Kavafis**]

[M] The speaker tells this historical figure to "say goodbye" to "the Alexandria you are losing" in a Cavafy poem titled "The God Abandons" this person. In a play by Shakespeare, this historical figure gives a funeral oration that begins, "Friends, Romans, countrymen, lend me your ears."

ANSWER: Mark **Antony** [or **Marcus Antonius**] (the play is *Julius Caesar*)

[E] Cavafy was an early 20th century poet who wrote in this modern language. The ancient form of this language was originally used to write down Homer's *Iliad*.

ANSWER: **Greek**

<European Literature>

6. These people participated in a ritual called sparagmos, during which they would sacrificially rip apart live animals with their bare hands. For 10 points each:

[M] Name this group of wild women that were often in a state of frenzied ecstasy from a combination of dancing and drinking.

ANSWER: **Bacchae** [accept **maenads** or **Bacchantes** or **Bassarids**]

[E] The Bacchae ("bock-kai") worshipped this Greek god of wine and festivity.

ANSWER: **Dionysus**

[H] The Bacchae were named after the bassaris, a type of clothing worn by Dionysus and made from this animal's skin. In some stories, Dionysus sent one of these animals from Teumessus to ravage the city of Thebes.

ANSWER: **fox**

<Mythology>

7. This shogunate's ruling family used three hollyhock leaves for its emblem. For 10 points each:

[E] This last shogunate of Japan was founded after Ieyasu's victory at the Battle of Sekigahara, ending the Sengoku Jidai, or Warring States period.

ANSWER: **Tokugawa** Shogunate

[M] This first of the three great unifiers of Japan used innovative military techniques to win the Battle of Nagashino. This man was later betrayed in the Honno-Ji incident and forced to commit *seppuku*.

ANSWER: **Oda** Nobunaga

[H] Oda brought this shogunate to an end when he overthrew its final shogun Yoshiaki. This shogunate ruled Japan during its Muromachi period, and followed the Kamakura shogunate.

ANSWER: **Ashikaga** Shogunate

<World History>

8. Despite asking Simon Wheeler for information about Reverend Leonidas Smiley, the narrator is told a story about this character who is "educated" by Jim Smiley. For 10 points each:

[M] Name this character who loses a contest after he is fed a few pounds of quail shot to slow him down.

ANSWER: **Dan'l Webster** [accept either name; accept "The **Celebrated Jumping Frog** of Calaveras County;" prompt on frog]

[E] Dan'l Webster is the title character of "The Celebrated Jumping Frog of Calaveras County," a story written by this author of *The Adventures of Huckleberry Finn*.

ANSWER: Mark **Twain** [or Samuel Langhorne **Clemens**]

[H] The narrator of "The Celebrated Jumping Frog of Calaveras County" abruptly leaves while Simon is trying to tell him a story about one of these creatures with one eye and no tail. While walking home with one of these creatures, a girl named Sylvia encounters a hunter at the beginning of Sarah Orne Jewett's story "A White Heron."

ANSWER: **cow** [or **cattle**] (Sylvia's cow is humorously named Mistress Moolly)

<US Literature>

9. Juergen ["YER-gen"] Teller photographed celebrities looking uncomfortable on a dirty sidewalk for the February 2021 issue of this magazine. For 10 points each:

[H] Teller photographed those celebrities in front of trees and parked cars in a photoshoot for this magazine. Sara Moonves is the editor-in-chief of this fashion magazine, which hosts the podcast *5 Things with Lynn Hirschberg*.

ANSWER: **W** [accept answers like "**W** magazine"]

[M] In one of Teller's portraits, this actor looks incredibly pained as he sits in an undersized metal chair. This South Korean actor played Glenn Rhee in *The Walking Dead*, and portrayed the patriarch Jacob Yi in *Minari*.

ANSWER: Steven **Yeun** [or **Yeun** Sang-yeop]

[E] In 2015, Teller garnered controversy for a similar photoshoot depicting this celebrity and her then-husband, Kanye West. This celebrity appeared nude on the cover of *Paper* magazine's 2014 "Break the Internet" issue.

ANSWER: **Kimberly** Noel **Kardashian** West [both underlined parts needed; accept Kim **Kardashian West**; prompt on **Kim** or **Kardashian** alone; do not accept or prompt on "West" alone]

<Pop Culture>

10. This language's `dplyr` package competes with its `data.table` package. For 10 points each:

[H] Name this language whose "tidyverse" group of packages also includes `tibble` and `ggplot2`.

ANSWER: the **R** language

[M] This data structure is R's simplest; R stores numbers as instances of this data structure with one component. A form of graphics named for these things is contrasted with raster graphics and uses them to trace smooth lines.

ANSWER: **vectors** [accept **vector** graphics]

[E] R's `ggplot2` package takes a `binwidth` parameter when producing one of these graphs. Similar to bar graphs, these plots show the number of values that fall within specific bins.

ANSWER: **histograms**

<Other Science>

11. The Lincolnshire Rising of 1536 was one rebellion against the dissolution of these locations. For 10 points each:

[H] Name these locations whose dissolution began after the passage of the Act of Supremacy. Robert Aske and Thomas Darcy later led a different rebellion against the dissolution of these places.

ANSWER: **monasteries** [accept **abbey**s; accept **priories**; accept **friaries**; accept **convents**]

[E] This ruler dissolved English Catholic monasteries after forming the Church of England. This ruler broke with the Catholic Church in order to divorce Catherine of Aragon, the first of his six wives.

ANSWER: **Henry VIII** [prompt on **Henry**]

[M] While Henry managed to dissolve some Irish monasteries, many were not destroyed until this ruler's invasion of Ireland. This ruler's forces perpetrated the Drogheda Massacre during that invasion of Ireland.

ANSWER: Oliver **Cromwell**

<Other History>

12. Characterized by their extensive webs of cracks, Ge and Guan ware were among the five styles of this artistic medium in China. For 10 points each:

[E] Name this medium produced in China's Five Great Kilns. Iconic blue and white works in this medium have been the subject of many imitations in Europe since the 1600s.

ANSWER: **pottery** [or **porcelain** or **ceramics** or **stoneware**; prompt on **chinaware**; prompt on **clay**]

[M] The Song dynasty's Five Great Kilns improved upon this technique of adding a glassy decorative layer to ceramics. This technique left mixed splashes of color on many Sancai figurines from the earlier Tang dynasty.

ANSWER: **glazing**

[H] Song kilns mixed iron oxide into many of their glazes to create celadons, which describes any glazed pottery of this color. Pottery under Korea's Goryeo dynasty was largely composed of celadons of this color.

ANSWER: **jade** [accept **green** or blue-**green** or gray-**green**]

<Other Fine Arts>

13. For 10 points each, answer some questions about the progression of the novel according to Ian Watt's book *The Rise of the Novel*.

[E] Watt describes how the "economic individualism" of this character created by Daniel Defoe helped spark the rise of the novel. In the novel this character titles, he gets shipwrecked on an island and befriends Friday.

ANSWER: **Robinson Crusoe** [accept either]

[H] Watt then describes how this author improved upon Defoe's form of the novel by using a "single action" to drive the plot as demonstrated in a novel whose protagonist is brutally mistreated by Mrs. Jewkes and Mr. B.

ANSWER: Samuel **Richardson** (the novel is *Pamela*)

[M] Watt claims that this author and his novel about Squire Allworthy's nephew who marries Sophia Western had less of an impact on the form of the novel than Defoe and Richardson.

ANSWER: Henry **Fielding** (the novel is *Tom Jones*)

<British Literature>

14. Hymns from the Rig Veda call this god "the hotar, the lavishest of wealth" and "radiant One, to whom the holy oil is poured." For 10 points each:

[M] Name this god who serves as the initial recipient of all sacrifices in Hinduism. Before Shiva, this god served as the god of destruction because of his never-ending desire, as represented by a substance with which he is associated.

ANSWER: **Agni**

[E] Agni is the god of this substance, which Hindus consider to be the constituent substance of the sun and lightning. In the now-defunct practice of Sati, a widow would immerse herself in this substance at her husband's funeral.

ANSWER: **fire**

[H] These ritual sacrifices in Hinduism are made by placing offerings in a sacred fire. A similarly named ritual in Zoroastrianism involves the preparation of *haoma* and bolsters the integrity of Ahura Mazda.

ANSWER: **yajna** [or **yasna**]

<Religion>

15. Answer the following about the Jahn–Teller effect, for 10 points each:

[E] The Jahn–Teller effect, in which a molecule becomes distorted to lower its energy, often occurs in coordination complexes of this transition metal. This metal is used in electrical wires and forms bronze when alloyed with tin.

ANSWER: **copper** [or **Cu**]

[M] Complexes that experience the Jahn–Teller effect most commonly have this molecular geometry, in which a central atom is bonded to six ligands.

ANSWER: **octahedral**

[H] The Jahn–Teller effect is strongest in four-valence electron compounds when this quantity is high, indicating a low splitting energy. Ligands with high multiplicity have a high value for this quantity.

ANSWER: **spin** [or **intrinsic angular momentum**; prompt on **angular momentum** alone]

<Chemistry>

16. A play set in this country ends with Styles asking a man who introduces himself as Robert to hold his smile while he takes a picture. For 10 points each:

[H] Name this country which is the setting of a play where a man steals an identity card off of a dead body outside Sky's bar. This country is also the setting of a play about Zachariah and his half brother Morris.

ANSWER: **South Africa** [Republic of **South Africa**; or **RSA**]

[E] The work-seeker permit that Sizwe Banzi needs to stay in Port Elizabeth was an aspect of this South African system of government-enforced segregation.

ANSWER: **apartheid**

[M] This anti-apartheid founder of the Serpent Players wrote both *Sizwe Banzi is Dead* and *Blood Knot*. In another one of this man's plays, Mastor Harold spits on his servant, Sam.

ANSWER: Athol **Fugard**

<World/Other Literature>

17. Answer the following about the music of the Shona people of Zimbabwe, for 10 points each.

[E] The hosho, which is often used to add rhythmic texture to Shona music, is a seed-filled percussion instrument performed in this way. Other instruments performed this way include maracas.

ANSWER: **shaking** [or **rattling**; accept **shakers**; accept clear equivalents that describe moving the instrument back and forth]

[M] Shona music centers on the *mbira*, which is alternatively known as a piano named for this body part. In Western piano music, this body part is represented by the number "1" in sheet music fingerings.

ANSWER: **thumbs**

[H] The mbira-derived instrument marimbula features in the music of this country, which is the origin of music styles including conga, mambo, and cha-cha-cha.

ANSWER: **Cuba**

<Classical Music>

18. Answer the following questions about how magnetic fields store and transfer energy, for 10 points each:

[M] These electrical components, which typically consist of coils of wire wrapped around an insulating core, store energy in a magnetic field. Their strength is measured in henries.

ANSWER: **inductors** [accept **solenoids**]

[H] The propagation of the energy flux of an electromagnetic field can be calculated from this vector, which is proportional to the cross product of the electric field and magnetic field.

ANSWER: **Poynting** vector [prompt on  $\mathcal{S}$ ]

[E] The amount of this quantity created by a magnetic field is always zero because the magnetic force is perpendicular to the magnetic field. In algebra-based physics, this quantity equals force times distance.

ANSWER: **work**

<Physics>

19. The Taa language spoken in Botswana has the largest functional load of these sounds, having between 45 and 115 depending on their classification. For 10 points each:

[H] Name these speech sounds, the factor contributing to the grouping of southern African Khoisan ("KOY-sahn") languages like Taa. These sounds' labial variety is written as a bullseye in IPA.

ANSWER: **click** consonants [prompt on **consonants**]

[E] In Taa and other Khoisan languages, alveolar and uvular clicks cannot occur before the "back" form of these sounds, which are contrasted with consonants.

ANSWER: **vowels**

[M] Central Khoisan languages use one of three suffixes to denote this quality of the word. While this concept can be assigned based on qualities like length, it is often assigned arbitrarily in languages like Spanish and German.

ANSWER: grammatical **gender**

<Social Science>

20. This ruler attempted to seek the aid of Lars Porsena, the king of Clusium, after an action committed by his son Sextus. For 10 points each:

[H] Name this ruler. This ruler was overthrown by a group that included his own nephew Lucius Junus Brutus.

ANSWER: Lucius **Tarquinius Superbus** [accept **Tarquin the Proud**; prompt on **Tarquin**; do NOT accept or prompt on "Lucius Tarquinius Priscus" or "Tarquin the Elder"]

[M] Lars Porsena was a king of these peoples, from whom the Tarquin dynasty is descended. These ancient Italian peoples warred with Rome until they were assimilated into the Roman Empire in 27 BC.

ANSWER: **Etruscans**

[E] Tarquin ordered the construction of the Temple of Jupiter on the Capitoline, one of these geographical features. Rome was legendarily founded on seven of these features, including the Aventine and Palatine.

ANSWER: **hills** [accept the seven **hills** of Rome; accept the Capitoline **Hill**; accept the Aventine **Hill**; accept the Palatine **Hill**]

<Other History>