2022 ACF Regionals
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Packet H by McGill A, Johns Hopkins, UNC B, Oklahoma

TOSSUPS

1. Euthymius of Athos popularized a story based on this person’s life in which the paranoid king Abenner imprisons his son after consulting with astrologers. This person is not Ezekial, but similarity to the name of a childhood home may indicate that this figure inspired Quranic mentions of Dhu al-Kifl. This figure was converted to Christianity by the hermit Barlaam according to the hagiography of a person often conflated with him, Saint Josaphat. This figure was legendarily conceived when his mother dreamt of a white elephant entering her side. After leaving his father’s palace, this figure encountered the four sights, making him aware of impermanence. This figure delivered his first sermon in the Deer Park. For 10 points, name this Brahmin prince who meditated under a Bodhi (“BODE-hee”) tree to attain enlightenment.
ANSWER: Gautama **Buddha** [accept **Siddhārtha** Gautama or Siddhārtha **Gautama**; accept **Shakyamuni**; accept **Josaphat** before read; reject “Jehoshaphat”]
<Religion>

2. Muñoz and Eaton proposed a two-state model of this process with an analytically solvable partition function. Martin Karplus pioneered *in silico* studies of this process using lattice models. The kinetics of this process can be understood using a plot in which the log of the relaxation rate forms a “v” plotted against the concentration of guanidinium (“gwahn-UH-din-EE-um”) chloride or urea. Molecules undergoing this process can be studied with phi-value analysis and progress (“pro-GRESS”) through an energy funnel in configuration space. In one model, this process is driven by increased stability of hydrophobic side chains “collapsing” into a globule shielded from the solvent. This process produces secondary structure elements like alpha helices and beta sheets. For 10 points, name this process in which a protein gains its native three-dimensional structure.
ANSWER: protein **folding** [prompt on answers that describe the formation of protein (tertiary) structure; prompt on denaturation by asking “what is the opposite of denaturation?”]
<Chemistry>

3. Peter Mutharika’s national policy for this issue targeted “three ones” and “three zeros.” Festus Mogae’s “war” on this issue included a program for mothers and children. John Iliffe’s (“ILL-if’s”) history of this issue discusses the Rakai report’s data on policies like “zero grazing” and the ABC strategy, which Quett Masire adopted in Botswana. Kinshasa’s Group M was the primary early source of this issue, which George W. Bush addressed with PEPFAR (“pep-far”). The TAC pushed for South African funding for this issue under Thabo Mbeki (“TAH-bo um-BECKY”), who embraced Kary Mullis’s denialism of its origins. In Zambia and eSwatini, the Gates Foundation funded mass circumcision to reduce this issue, which arose in Cameroon from a chimpanzee-derived pathogen. For 10 points, 25 million Africans live with what disease that became an epidemic in the 1980s?
ANSWER: **HIV**/AIDS [or **AIDS** epidemic; or **human immunodeficiency virus** infection; or **acquired immunodeficiency syndrome**; accept HIV/**AIDS** denialism; accept **HIV**-1 or **HIV**-2; accept President’s Emergency Plan for **AIDS** Relief; prompt on sexually-transmitted diseases or infections or epidemics or retroviruses or immunodeficiency or similar; prompt on public health or similar]
(TAC stands for Treatment Action Campaign.)
<World History>

4. This author refers to himself as "the Prize Winner" in a book that refutes Kate Millett's reading of his work as sexist; that book is titled *The Prisoner of Sex*. An essay by this author begins with a discussion of the "psychic havoc" of World War II. This author describes attending a Washington, D.C., event with his friend Mitch Goodman in a book with sections titled "History as a Novel" and "The Novel as History." This author wrote some "superficial reflections on the hipster" in his essay "The White Negro" and wrote a novel about his attendance at the March on the Pentagon. A novel by this author recounts the capital punishment of Gary Gilmore. For 10 points, name this author of the nonfiction novels *The Armies of the Night* and *The Executioner's Song*.
ANSWER: Norman **Mailer** [or Nachem Malech **Mailer**]
<American Literature>

5. An artwork in this medium depicts a disembodied pair of legs and a broken sword against a red mosaic background. For an artwork in this medium, Roger Kastel reused a model lying on two stools from a *Good Housekeeping* ad. On an artwork in this medium, Dawn Baillie placed a Philippe Halsman photograph of seven naked women forming a skull. Spirograph toys inspired hypotrochoid graphs an artwork in this medium whose artist later used paper cutouts to depict a murdered body on another. A Star of David is impaled on barbed wire in the last artwork in this medium designed by Saul Bass. A death's-head moth covers a woman's mouth in an artwork in this medium, another of which features a shark rising toward a nude woman. For 10 points, name this medium that advertises media like *The Silence of the Lambs*.
ANSWER: movie **poster**s [or film **poster**s or cinema **poster**s; accept posters of specific movies; prompt on promotional material; prompt on ads; prompt on one-sheeters; prompt on book cover before "Spirograph" by asking "what was the image later used for?"] (The unnamed films are *Saint Joan*, *Jaws*, *Vertigo*, *Anatomy of a Murder*, and *Schindler's List*.)
<Other Fine Arts>

6. Anna-Dorothee von den Brincken proposed an alternate use for the "silent" types of these objects as narrative devices. Simon Marmion divided one of these objects between the three sons of Noah in Burgundian court historian Jean Mansel's *Fleur des Histoires*. Guillaume Le Testu belonged to a collective that produced these objects in Dieppe. A massive example of these objects named for Gervase of Ebstorf influenced the one displayed at Hereford Cathedral; those examples of these objects follow the medieval T-O design. It's not made of silver, but one of these objects was commissioned by Roger II from Muhammad al-Idrisi to have an atypical orientation. For 10 points, name these objects for which Dutch geographer Gerardus Mercator developed a projection method.
ANSWER: **map**s [accept **atlas**es; accept **map** projections; accept T and O **map** or O-T **map** or T-O **map** or Isidoran **map**; accept Hereford **Map**pa Mundi; accept Ebstorf **Map**; accept "silent **map**s"; prompt on *Tabula Rogeriana*]
<European History>

7. These facilities ramp down during the "belly" of the duck curve and then have to quickly ramp up during its "neck." The spinning reserve is a synchronized excess maintained by these facilities to ensure reliability and fault tolerance. The baseload type of these facilities are complemented by a more responsive type of them called peakers. These facilities are typically configured with many devices that each have an output made up of three components separated by a 120-degree phase difference. Cogeneration occurs when the exhaust energy from turbines in these facilities is used for thermal energy. Transformers step up the output of these facilities to a higher voltage for long-distance transmission. For 10 points, name these facilities that supply energy to the electric grid.
ANSWER: **power plant**s [or **power station**s, or **generating station**s; accept thermal **power plant**s; accept **power plant**s that use any input energy source, such as coal, natural gas, nuclear, or hydroelectric; accept baseload **power plants** or peaking **power plant**s; prompt on electrical generators or turbines by asking "as a component of what larger facilities?"; prompt on wind turbines]
<Other Science>

8. A character in this book describes the army recruiting children by saying the afterlife is better than Disneyland. This book's narrator describes a black cloud enveloping her country while on holiday in Madrid. This book's protagonist is accused of theft while lodging with Dr. Heller. This book's narrator rebels by listening to Kim Wilde music and receives an Iron Maiden poster from her parents' trip to Turkey. This book's protagonist contracts bronchitis after breaking up with Markus in Vienna. This book ends with the line "freedom has a price." This book's protagonist visits the prison where her uncle Anoosh died and sees her grandmother before leaving home forever. For 10 points, name this graphic novel set during the Iranian Revolution that chronicles the life of its author, Marjane Satrapi ("mar-JAHN sah-trah-pee").
ANSWER: ***Persepolis*** [accept ***Persepolis**: The Story of a Childhood* or ***Persepolis**: The Story of a Return*]
<World Literature>

9. Alexandr Dugin has revived interest in an opera by this composer that was censored, was retitled as *Hammer and Sickle*, and features a set of four Polish dances in its mostly ballet second act. This composer apocryphally acquainted himself with dissonance by listening to the out-of-tune bells in his native Smolensk. This composer's song cycle *Farewell to Saint Petersburg* features his song "The Lark," a major inspiration for Mily Balakirev ("buh-LAH-kee-riff"). This composer of an overture based on the folk song "Kamarinskaya" composed an opera that focuses on a man who saves a ruler by diverting an army detachment and another based on a Pushkin poem about a knight and his abducted lover. For 10 points, name this early Russian romantic who composed the operas *A Life for the Czar* and *Ruslan and Ludmilla*.
ANSWER: Mikhail **Glinka** [or Mikhail Ivanovich **Glinka**]
<Classical Music>

10. The Kinnara and Kinnari, hybrids of humans and these animals, serve as divine musicians. The droppings of one of these animals turns Don Pedro and Don Diego to stone in a namesake Filipino epic, the *Ibong Adarna*. These animals adorn the Karaweik barge in Yangon. Many Gogoryeo tombs feature a hybrid with a human face and the body of this animal, the Inmyeonjo. One of these animals bearing a shield with symbols of Pancasila ("pahn-chah-SEE-lah") serves as the coat of arms of Indonesia. A figure often represented as one of these animals drives Kaliya into a river; to free his mother from the sons of Kadru ("CAD-roo"), that humanoid one of these animals steals amrit. For 10 points, Garuda ("guh-ROO-duh") is the king of what animals that are enemies of the serpents?
ANSWER: **bird**s [or **avian**s or **Aves**; accept specific types, like the Brahminy **kite** or **eagle**; accept **Garuda** or Ibong **Adarna** before each is read]
<Mythology>

11. Roger of Howden recounts a large ivory horn gifted during one of these events to Baldwin of Ford; during widespread anti-Semitic riots after that one of these events, Jews in York were offered a choice of baptism or death, according to Richard of Devizes. Barons opposed to King John based their political demands on the Charter of Liberties, which was issued during one of these events by Henry I. Henry Beaufort settled for Paris as the location of one of these events since Charles VII controlled the cathedral in Reims ("REEMZ"). George Frideric Handel composed "Zadok the Priest" to be performed at these events, the only regular occasion for which most of the crown jewels leave the Tower of London. For 10 points, name these events, during which the archbishop of Canterbury anoints a British monarch.
ANSWER: **coronation**s of British monarchs [accept **crowning**s before "crown jewels"; accept the **coronation** of Richard I or the **coronation** of Richard the Lionheart or the **coronation** of Henry I or the **coronation** of Henry VI or the **coronation** of George II] (The first sentence is about the coronation of Richard I.)
<Other History>

12. A poem written by this character is often interpreted as a satire of *The Land*, a poetic celebration of the Kentish Weald ("WEELD") written by this character's real-life inspiration. Purity, Chastity, and Modesty dance around this sleeping character before they are dispelled by a trumpet blast. In a (emphasize) *novel*, a man nearly falls to his death after seeing the ankle of this character, who is criticized by Nick Greene. After Sasha abandons this character on a frozen river, this character revisits the poem *The Oak Tree*. This character marries the sea captain Marmaduke Bonthrop Shelmerdine in the 19th century, and had earlier prepared his estate for Queen Elizabeth's arrival. For 10 points, name this 300-year old title character who changes from a man to a woman in a novel by Virginia Woolf.
ANSWER: **Orlando** [accept ***Orlando****: A Biography*] (The real-life inspiration mentioned in the first line is Vita Sackville-West.)
<British Literature>

13. This scientist is the alphabetically (emphasize) *first* in a doubly eponymous method in robot dynamics that iterates out from the base link to find the net force on each link, then iterates back towards the base to find torques. Equations named for this scientist express the relationship between the time derivative of angular momentum in the body frame and in the space frame. The same axis is used for the first and third rotations when defining a set of quantities named for this scientist that specify rigid body orientation. Paths for which the action is stationary are solutions to a set of equations named for Joseph-Louis Lagrange ("zhoh-zef loo-ee lah-granzh") and this scientist. This scientist's formula transforms complex exponentials to coordinates on the unit sphere. For 10 points, name this prolific 18th-century Swiss mathematician.
ANSWER: Leonhard **Euler** ("OY-ler") [accept Newton–**Euler** method; accept **Euler**'s equations; accept **Euler** angles; accept **Euler**–Lagrange equations; accept **Euler**'s formula]
<Physics>

14. The FAO estimates that up to 30% of this industry's output is IUU, or "illegal, unreported, and unregulated," with an annual cost of up to 23 billion dollars. After being a victim of labor trafficking, Vannak Anan Prum is fighting against the slavery that sustains this industry in Thailand. Carlos Rafael earned a nickname that puns on *The Godfather* as a kingpin of this industry before federal agents disguised as Russian mobsters took him down. A low-impact technique in this industry uses seines ("sayns") that are pursed at the bottom. This industry is banned in a huge sanctuary created by closing 80% of Palau's exclusive economic zone. Benthic habitats are destroyed by this industry's bottom trawls. For 10 points, what industry's wild harvests are contrasted with farmed aquaculture?
ANSWER: **fish**ing [or word forms like commercial **fish**eries; accept **seafood**; accept specific marine species like **shrimp** or **cod** or bluefin **tuna**; prompt on food or catching food or harvesting food; reject "whaling"] (Carlos Rafael was nicknamed "The Codfather.")
<Current Events>

15. This thinker's review of his student Jacob Moleschotts's book *The Theory of Food* is the origin of the punning dictum "Man is what he eats." One of this thinker's books touts the impossibility of a "religion of the elephants" in stating that self-consciousness dependent on nature is the defining characteristic of mankind. This thinker's view that humans created the concept of God by elevating abstract human characteristics led to his proclamation that "theology is anthropology." This philosopher's thought bridges that of his teacher Hegel and a younger thinker who wrote, "The philosophers have only *interpreted* the world," in a pamphlet titled for this man. For 10 points, name this German philosopher who wrote *The Essence of Christianity* and who titles a set of "theses" by Karl Marx.
ANSWER: Ludwig **Feuerbach** ("FOY-er-bock") [or Ludwig Andreas von **Feuerbach**; accept "Theses on **Feuerbach**"] (Feuerbach's eating dictum is only a pun in German, since it reads, "Der Mensch ist was er isst.")
<Philosophy>

16. An essay that unusually proposes that this author was murdered discusses his 17-act play *The Living Corpse*. In a story by this author, a man walks in circles before yelling "I'm coming!" and lies on his servant to save him from freezing in a snowstorm. In another story by this author, a hermit cuts off his finger to resist temptation. George Saunders's *A Swim in a Pond in the Rain* ends by discussing a story by this author, whose title character dies while clearing snow off a roof and is named for the crockery that he breaks as a child. This author of "Master and Man" wrote a story whose title character hears the words, "It is finished" and screams for three days. In that novella by this author of "Alyosha the Pot," a judge dies after hanging curtains. For 10 points, name this author of *The Death of Ivan Ilyich.*
ANSWER: Leo **Tolstoy** [or Lev Nikolayevich **Tolstoy**] (The essay mentioned in the first line is Elif Batuman's "The Murder of Leo Tolstoy," which is included as a chapter in *The Possessed.*)
<European Literature>

Note to moderator: Read the answerline carefully.
17. Carroll Quigley placed this process after the "Age of Expansion." This process titles a book that opens by comparing two farms in Montana and later analyzes Australian mining, Norse Greenland, and Tikopia. Reduced social resilience leads to this process in Peter Turchin's cliodynamics. McAnany and Yoffee's volume "questioning" this process debunks the "myth of ecocide." Citing the Ik and Hohokam ("ho-HO-kum"), Joseph Tainter attributed this process to lower marginal returns, resource depletion, and catastrophes. This process titles a book that cites deforestation in Chaco Canyon and Rapa Nui ("RAH-puh NOO-ee") and drought in the Maya Yucatán to explain "how societies choose to fail or succeed"; that book was written by Jared Diamond. For 10 points, a history by Edward Gibbon attributes what disputed process to the Roman Empire?
ANSWER: societal **collapse** [accept similar answers like the **fall** of civilizations or civilizational **decline**; accept general **crises** in civilization; accept *The History of the **Decline** and Fall of the Roman Empire*; prompt on depopulation or local extinction or similar; prompt on *The Evolution of Civilizations* or Age of Conflict by asking "what did Quigley place at the end of that progression?"]
<Social Science>

18. The U-shape popular in art from this country was inspired by the mark of a cross-legged person in sand. An artist from this country created thousands of paintings of yam roots and used the "dump dump" technique to paint *Earth's Creation* while at the Utopia art colony. The Hermannsburg School centered on an artist from this country who created watercolor landscapes of ghost gum trees. After studying with the Papunya Tula art collective, Geoffrey Bardon popularized this country's Indigenous style of "dot painting" among children. This country's Indigenous artists include Albert Namatjira and Emily Kame Kngwarreye ("ING-wur-ai"). For 10 points, what country contains a building with a roof made of sail-like shells that was designed by Jørn Utzon ("YAWN oot-sun") for its Sydney Harbour?
ANSWER: **Australia** [or Commonwealth of **Australia**]
<Painting/Sculpture>

19. Either "secondary" or this adjective describes hosts in which parasites perform only asexual reproduction, in contrast to definitive hosts. This adjective names a discredited hypothesis of ecologists like Joseph H. Connell that holds that biodiversity is maximized by certain levels of disturbance. This adjective names an animal-specific protein family that contains six types of ropelike, stress-resistant, non-nucleotide-binding proteins with rod domains. This adjective names the diverse protein family of desmin, vimentin, nuclear lamins, and acidic and basic keratins. With an average diameter of 10 nanometers, this type of cytoskeletal filament is wider than microfilaments and narrower than microtubules. For 10 points, what term also names short-lived chemical species that further react to give the final products of a reaction?
ANSWER: **intermediate** [accept reaction **intermediate**s or reactive **intermediate**s; accept **intermediate** filaments; accept **intermediate** disturbance hypothesis; accept **intermediate** host; prompt on IF or IVT or IDH by asking "what does that stand for?"]
<Biology>

20. A 19th-century diary in this language was written by the overseer of the planter Thomas Spalding on Sapelo Island. Francis Scott Key provided a translation of the Bible in this language to a man known as "Uncle Moreau." Spanish and this language were spoken by the explorer Estevanico. This language was used for the longest unbroken treaty in American history, signed with the first kingdom to recognize the United States' independence. George Sale's translation of a text written in this language was owned by Thomas Jefferson. Followers of Wallace Fard were given names originating from this language to replace their "slave names." For 10 points, name this language used by the enslaved scholar Omar ibn Said ("ih-bun sah-YEED") to write his autobiography, which included Quranic verses.
ANSWER: **Arabic** [or al-**ʿarabiyyah** or **ʿarabīy**; accept specific dialects like Moroccan **Arabic** or **Darija**; prompt on Berber or Amazigh by asking "Estevanico likely spoke a Berber-influenced dialect of what language?"] (The diary in the first line is the Bilali Document. The fourth line refers to the Moroccan-American Treaty of Friendship.)
<American History>

Tiebreaker. An artist from this country created a piece that requires two participants to bind their hands together with a Möbius strip as part of the *Nostalgia of the Body* series. An artist from this country who died of lead poisoning painted the *War and Peace* panels at the UN Headquarters. Lygia Clark was a leading member of this country's Neo-Concrete movement. An artist from this country depicted a woman with giant feet next to a cactus in the painting *Abaporu.* A hyperboloid cathedral made from concrete columns sits in this country's bird- or airplane-shaped capital city. A 98 foot-tall concrete and soapstone sculpture atop a mountain in this country depicts a religious figure with his arms open. For 10 points, name this home country of Tarsila do Amaral, which contains the *Christ the Redeemer* statue.
ANSWER: **Brazil** [or **Brasil**; or Federative Republic of **Brazil** or República Federativa do **Brasil**] (The second line refers to Candido Portinari.)
<Painting/Sculpture>

BONUSES

1. The surface air temperature increase along the coastal northeastern US in the 21st century is associated with a weakening of this phenomenon and a more persistent positive North Atlantic Oscillation. For 10 points each:
[10h] Identify this phenomenon that is monitored by the RAPID/MOCHA/WBTS ("rapid mocha W-B-T-S") array. The NADW and AABW water masses are part of this phenomenon that is key to global heat redistribution.
ANSWER: **Atlantic meridional overturning circulation** [or **AMOC** ("A-mock"); prompt on MOC ("mock") or meridional overturning circulation; prompt on thermohaline circulation]
[10e] A 2021 *Nature Geoscience* communication compiled many proxies measuring the AMOC's ("A-mocks") weakening, such as delta-15N data from these organisms. These marine invertebrates have a "bleached" appearance after they expel zooxanthellae ("zoh-uh-zan-thell-ee").
ANSWER: **coral**s [prompt on Anthozoa] (The referenced article is "Current Atlantic Meridional Overturning Circulation weakest in last millennium" by Caesar, L., McCarthy, G. D., Thornalley, D. J. R., et al.)
[10m] During circulation, upwelling brings cold deep water to the surface as this transport mechanism creates divergence zones in surface water. In this transport mechanism, surface water moves perpendicular to the wind.
ANSWER: **Ekman** transport [accept **Ekman** spiral]
<Other Science>

2. *Two answers required.* After one of these composers included a deliberately high violin note in an oratorio, the other composer refused to play it, potentially because he was not even able to reach it. For 10 points each:
[10h] Name these two composers who met through concerts organized by Pietro Ottoboni. The German-born one of these composers imitated the Italy-born other one by including twelve of a certain type of work in his opus 6.
ANSWER: Arcangelo **Corelli** AND George Frideric **Handel** [accept in either order]
[10e] Both Corelli and Handel included twelve "grosso" compositions in this form in their opus 6. More common "solo" pieces in this form feature virtuosic passages for a solo instrument with orchestral accompaniment.
ANSWER: **concerto** [or **concerti**; accept **concerto** grosso or **concerti** grossi]
[10m] Ottoboni also sponsored Alessandro Scarlatti, who led a school of opera based in this Italian city. Enrico Caruso's version of "O sole mio" exemplifies a hugely popular style of "canzone" from this city.
ANSWER: **Naples** [or **Napoli**; accept **Neapolitan** Opera School; accept canzone **napoletana**]
<Classical Music>

3. This novel is titled for a phrase that appears alongside a painting of a flower and briefly gives the unnamed protagonist hope for the future. For 10 points each:
[10h] Name this novel in which the protagonist's poverty is contrasted with his wealthy former classmate Koomson. The protagonist is known only as "the man" in this novel by Ayi Kwei Armah ("uh-YEEK-way ar-mah").
ANSWER: *The **Beautyful Ones Are Not Yet Born***
[10m] This home country of Ayi Kwei Armah provides the setting for *The Beautyful Ones Are Not Yet Born*. Ama Ata Aidoo ("ah-mah ah-tah AI-doo") is from this country, where the novelist Yaa Gyasi ("JEH-see") was born.
ANSWER: **Ghana** [or Republic of **Ghana**]
[10e] The unnamed protagonist of *The Beautyful Ones Are Not Yet Born* refuses a bribe at his railway station workplace; Obi accepts a bribe in *No Longer at Ease*, a novel by this author of *Things Fall Apart*.
ANSWER: Chinua **Achebe** ("CHIN-wah uh-CHEH-bay")
<World Literature>

4. Philosophers like al-Tawḥīdī and Miskawayh were patronized by this dynasty, which comprised three emirates ruled by Imad al-Dawla and his brothers from Shiraz, Ray, and Baghdad. For 10 points each:

[10h] Name this Daylamite dynasty, a contemporary of the Samanids and Saffarids during a period that Vladimir Minorsky dubbed the "Iranian intermezzo." In 1055, the Seljuk Tughril Beg captured Baghdad from this Shī‘a dynasty.

ANSWER: **Buyid** dynasty [or the **Buyid**s; or **Buwayhid** dynasty; or Āl-e **Būya**]

[10m] The Buyids compiled the encyclopedia *al-Ḥāwī* by al-Rāzī, who reformed these places in Baghdad on the eve of its Buyid conquest. Saladin preserved one of these places dedicated to Saint John near Jerusalem's Holy Sepulchre.

ANSWER: **hospital**s [accept **hospice**s or **clinic**s or **ward**s; accept **medical** facilities or **health care** facilities or similar; or al-**Bīmāristān**; or **dar al-shifa**; or **mustashfa**; accept Knights **Hospitaller** or Order of Knights of the **Hospital** of Saint John of Jerusalem] (The second sentence refers to the original hospital of the Knights Hospitaller.)

[10e] Many early hospitals in dar al-Islam were built in holy sites like Kairouan and this city where the prophet Muḥammad drafted a constitution. In 622, Muḥammad's followers traveled (emphasize) *to* this city in the Hijra ("HEHJ-ruh").

ANSWER: **Medina** [or **Yathrib**; or al-**Madīna**; or al-**Madīnah** al-Munawwarah; accept Constitution of **Medina** or Charter of **Medina** or Dustūr al-**Madīna** or Ṣaḥīfat al-**Madīnah** or Mīthāq al-**Madīna**]

<World History>

5. A widely adopted writing system for this type of word in the Alaskan Inupiaq language was created in 1994 by a group of Inupiat middle school students in Kaktovik, Alaska. For 10 points each:

[10h] Name this type of word that is the subject of disagreement between linguists Peter Gordon and Daniel Everett. In a certain language, the words *hói* and *hoí*, two words of this type, are distinguished only by tone.

ANSWER: **number**s [or **numeral**s or **number** words or **count**ing words or **count**ing systems; accept descriptions such as "words used to **count**"; accept specific answers like Pirahã **number**s] (The unnamed language is Pirahã.)

[10e] The Kaktovik number graphemes ("GRAF-eems") were designed because Inupiaq counts in base 20. Arabic numerals worked poorly in Inupiaq because they were designed for a numeral system with this number as the base.

ANSWER: **ten** [or **10**; or base **ten**; accept **decimal**]

[10m] Most grammarians include cardinal numbers among these parts of speech that usually precede a common noun in English. Other examples of these parts of speech include articles like "the" and demonstratives like "that."

ANSWER: **determiner**s [or **determinative**s or **determinant**s; accept **DET**]

<Social Science>

6. Answer the following about femtochemistry, for 10 points each.

[10m] In a pioneering study, Ahmed Zewail's group used ultrashort laser pulses to measure the properties of this configuration for the dissociation reaction of cyanogen iodide. This unstable configuration is the high energy point along the reaction coordinate.

ANSWER: **transition state** [or **TS**; accept **activated complex**]

[10h] Zewail's study used this technique, which uses ultrashort laser pulses to excite the sample and measure absorption or stimulated emission from the excited state.

ANSWER: **pump-probe** spectroscopy [accept **pump-probe** microscopy; accept **femtosecond transition-state spectroscopy** or **FTS** (the name originally used by Zewail et al.)]

[10e] Pump-probe techniques can be used to image molecules that don't undergo this process, unlike conventional two-photon microscopy. Excited electronic states decay by emitting a photon in this process, which has a shorter lifetime than phosphorescence.

ANSWER: **fluorescence** [or word forms]

<Chemistry>

7. The lesbian biker RC introduces Agnes to the potentially AWOL Gulf War veteran Peter in this author's play *Bug*. For 10 points each:

[10h] Name this contemporary playwright who wrote a screenplay adaptation of his play *Killer Joe*, which is about a man who is hired to kill the mother of the drug dealer Chris. The devout Baptist Ken suddenly loses his faith and travels to London in this author's play *Man from Nebraska*.

ANSWER: Tracy **Letts**

[10m] Letts's play *Bug* is primarily set in one of these locations. Hannah Jelkes's grandfather Nonno writes his last poem in one of these locations in Tennessee Williams's play *The Night of the Iguana*.

ANSWER: **hotel** room [or **motel** room]

[10e] Letts won the Tony Award for Best Actor for his role as George in the revival of this author's play *Who's Afraid of Virginia Woolf?*

ANSWER: Edward **Albee** [or Edward Franklin **Albee** III]

<American Literature>

8. American neutrality during this war prevented the SMS *Cormoran* from creating a German port; when the Americans entered the war, the Germans decided to scuttle the ship instead. For 10 points each:

[10e] Name this war that the United States entered in part due to unrestricted submarine warfare used by German U-boats, such as during the sinking of the *Lusitania*.

ANSWER: **World War One** [or the **Great War**; or **WWI**; or the **First World War**]

[10h] The *Perth Amboy* was attacked by a U-boat during an offensive off the coast of this state's town of Orleans; that attack on this state was the only attack on the continental United States during its involvement in World War I.

ANSWER: **Massachusetts** [or **MA**]

[10m] The wreck of the *Cormoran* lies next to a ship sunk during Japan's occupation of this island in World War II. Henry Glass captained the *Charleston* during a bloodless capture of this island in the Spanish-American War.

ANSWER: **Guam** [or **Guåhan**]

<American History>

9. Answer the following about the controversial former archbishop of Lusaka Emmanuel Milingo. For 10 points each:

[10e] Milingo is best known for agitating for reform to allow Catholic clergy to engage in this practice. This is the only sacrament that Catholic priests are barred from receiving.

ANSWER: **marriage** [or getting **married** or equivalents; accept Holy **Matrimony**]

[10m] Milingo was excommunicated from the Catholic priesthood in 2001 after getting married in a ceremony administered by this other church. This church's blessing ceremonies feature mass weddings.

ANSWER: **Unification** Church [or Family Federation for World Peace and **Unification**; accept **Unificationist**s; prompt on Moonies]

[10h] Milingo's excommunication was delivered in this manner, since it was automatically issued by virtue of his marriage. This two-word Latin phrase refers to actions taken by the church that happen without any deliberation by judges, unlike ferendae rulings.

ANSWER: **latae sententiae** excommunication

<Religion>

10. Two musicians of this ethnicity collaborated on the 2008 album *Kinsmen*. For 10 points each:
[10h] Name this ethnicity of the players on the 2006 jazz album *Raw Materials*. An American pianist and Harvard professor of this ethnicity known for leading jazz trios recorded the 2021 album *Uneasy* alongside Linda May Han Oh and Tyshawn Sorey.
ANSWER: **Indian**-American [accept **Tamil**; accept **Kannada**; accept **Desi**; prompt on South Asian] (The unnamed musicians are Vijay Iyer and Rudresh Mahanthappa.)
[10m] Indian classical music and jazz were played together by the ensemble Shakti, which was led by John McLaughlin ("muh-CLOCK-lin"), a pioneer of this musical subgenre. Mahavishnu Orchestra, Weather Report, and Return to Forever all primarily played this style of jazz.
ANSWER: jazz **fusion** [accept **progressive** jazz]
[10e] The ensemble Shakti also included Zakir Hussain, who played the tabla, an instrument of this type. A typical jazz trio consists of a pianist, a bassist, and a player of a "kit" of these instruments.
ANSWER: **drum**s [accept **drum** kit; accept **percussion**]
<Other Fine Arts>

11. Livy claims that Servius Tullius moved his residence to the Esquiline, one of these locations, to make it more respectable. For 10 points each:
[10e] Name these places that include the Capitoline and the Palatine ("PAL-uh-tine"). Seven of these geographical landforms are traditionally said to form the heart of ancient Rome.
ANSWER: **hill**s of Rome [accept Esquiline **Hill** or Capitoline **Hill** or Palatine **Hill**; accept **collis** or **colles**; accept **mons** or **montes**]
[10m] The Quirinal ("KWIR-ih-null") Hill was named after the Sabine and early Roman god Quirinus ("kwih-RAI-nuss"), whose name later became an epithet of this Roman god. Numa Pompilius constructed a temple to this god, whose doors remained closed throughout Numa's reign.
ANSWER: **Janus** [or **Ianus**; accept **Janus** Quirinus]
[10h] This mythical monster, whose name is derived from the Greek for "bad," lived on the Aventine ("AA-vin-tine") Hill before the founding of Rome. According to tradition, the Ara Maxima in the Forum Boarium was located at the site where this figure was strangled to death.
ANSWER: **Cacus** [accept ***kakos***]
<Mythology>

12. In 2014, the FDA recommended halving the dosage of this drug for women, since ten to fifteen percent of women who take it may risk impaired driving eight hours later, compared to three percent of men. For 10 points each:

[10h] Name this imidazopyridine ("imid-azo-pyridine") $GABA_A$ ("GAB-uh-A") receptor agonist. This psycholeptic Z-drug is prescribed far more often than other nonbenzodiazepines ("non-ben-zoh-dai-AA-zuh-peens"), like eszopiclone ("ess-ZAHP-ih-clone") or zaleplon ("zuh-LEP-lahn").

ANSWER: **zolpidem** [accept **Ambien** CR or **Intermezzo** or **Edluar** or **Zolpimist** or **Stilnox** or **Stilnoct** or **Sanval** or **Ivadal**; prompt on sleeping pills or sleep aids by asking "what specific drug?"; prompt on unfamiliar drug names (many of which start with Zol) by requesting "please give a common American name"]

[10e] Zolpidem treats insomnia better than this indolamine sold as Circadin in prolonged-release tablets. Artificial light inhibits the pineal ("PAI-nee-al") gland's production of this hormone, which may treat jet lag or non-24-hour sleep-wake disorder.

ANSWER: **melatonin** [or ***N*-acetyl-5-methoxy tryptamine**; accept prolonged-release **melatonin**; prompt on PRM]

[10m] Like melatonin, this amino acid's beta-isomer may promote sleep; lifters already take it as a supplement since it forms carnosine with histidine. The Cahill cycle converts pyruvate ("pai-ROO-vayt") to this small amino acid with a methyl side chain.

ANSWER: **alanine** [or **Ala** or **A** or alpha-**alanine** or **2-aminopropanoic acid**; accept beta-**alanine** b-**alanine** or beta-**ALA** or **3-aminopropanoic acid**; accept L-**alanine** or D-**alanine**; accept glucose–**alanine** cycle] (Evidence in mice for β-alanine as a sleep-promoting neurotransmitter comes from a December 2021 *Current Biology* paper from Keenan et al.)

<Biology>

13. In a 2018 paper, Hoffmann et al. attributed paintings on stalagmites in La Pasiega, Maltravieso, and Doña Trinidad to this species. For 10 points each:

[10m] Name this species, whose first remains were discovered in the Kleine Feldhofer Grotte. Clive Finlayson linked this species's extinction to a lack of available water based on studies from the Gorham's Cave complex.

ANSWER: **Neanderthal**s [or **Neandertal**s or ***H****omo sapiens* ***neanderthalensis***]

[10h] Around 43,000 years ago, this culture migrated out of Africa to become the first modern humans to permanently settle in Europe. This culture depicted the first human figurines in the Venus of Hohle Fels ("HO-luh FELLS").

ANSWER: **Aurignacian** ("or-ig-NAY-shin") [accept Proto-**Aurignacian**]

[10e] The Aurignacian culture existed as part of this period in human culture that started with the invention of stone tools by Neanderthals. This early phase of the Stone Age forms the near entirety of human prehistory.

ANSWER: **Paleolithic** Age [accept **Old Stone Age**; prompt on Stone Age]

<Other History>

14. *Description acceptable.* Two visitors to this place give insults such as "damn your pig" and "damn your prune sauce" in response to every dish they are offered. For 10 points each:
[10h] Name this place. A man declares "there's not a pond or a slough within five miles of" this place "but they can tell the taste of" after running a carriage in circles around this place and crashing into a horse-pond.
ANSWER: **Hardcastle house** [accept descriptions like the **house** or **estate** from ***She Stoops to Conquer***]
[10m] A woman with this first name dresses as a barmaid to woo Charles Marlow in the Hardcastle house. In another play, a woman with this first name gives a speech concluding that "our lances are but straws."
ANSWER: **Kate** [accept **Kate** Hardcastle; accept **Kate** Minola or **Katherina** Minola (from *The Taming of the Shrew*)]
[10e] This author of *The Vicar of Wakefield* drew from the time he accidentally walked into a private mansion in writing about Charles Marlow's mistaking the Hardcastle house for an inn in his play *She Stoops to Conquer.*
ANSWER: Oliver **Goldsmith**
<British Literature>

15. Very few of this artist's paintings survive, partially because many of them were lost at sea on a voyage to Sweden. For 10 points each:
[10h] Name this artist of a painting that depicts a blindfolded Christ being mocked. Mary wears a solid black dress in an Annunciation scene that this artist included in an altarpiece that includes depictions of Saints Sebastian and Stephen flanking the central scene in its closed view.
ANSWER: Matthias **Grünewald** [or Matthias **Gothart**; or Matthias **Neithardt**; accept **Mathis** in place of "Matthias"]
[10m] Grünewald is best known for this altarpiece, whose sculptural elements were created by Nikolaus of Haguenau. Its typical closed view depicts a crucifixion.
ANSWER: ***Isenheim*** *Altarpiece*
[10e] Grünewald's *Stuppach Madonna* was attributed to this artist for several centuries. This Flemish artist painted many fleshy nudes and the *Marie de' Medici* cycle.
ANSWER: Peter Paul **Rubens**
<Painting/Sculpture>

16. Julie Ward posited that this thinker was the first to properly claim "all men are equal" because he included Africans in his considerations. For 10 points each:
[10h] Name this Ethiopian philosopher who, with his student Walda Heywat, wrote the *Hatäta*, which Claude Sumner has compared to Descartes's *Discourse on Method*.
ANSWER: Zera **Yacob**
[10e] Yacob legendarily wrote the *Hatäta* while living in one of these places. Prisoners chained up in one of these places view nothing but shadows on the wall in an "allegory" from Plato's *Republic*.
ANSWER: **cave** [or **cavern**; accept the Allegory of the **Cave**]
[10m] Yacob's *Hatäta* opens by presenting a form of this argument by pointing out that a person's existence is contingent on the existence of their parents. The kalām version of this argument hinges on the impossibility of a temporal infinite regress.
ANSWER: **cosmological** argument for the existence of God [accept kalām **cosmological** argument; accept argument from **universal causation**; accept argument from **first cause** or **causal** argument; accept **prime mover** argument; prompt on the existence of God]
<Philosophy>

17. Bobby Troup wrote a standard for the Nat King Cole trio titled "Get Your Kicks on [this highway]." For 10 points each:
[10e] Name this iconic highway, the first to connect Chicago and Los Angeles.
ANSWER: US **Route 66** [or US **Highway 66**; or **US 66**; prompt on the Main Street of America; prompt on, BUT DO NOT OTHERWISE REVEAL, Will Rogers Highway]
[10h] A runner of this ethnicity named Andy Payne won the "Bunion Derby," a footrace from New York to LA. along much of Route 66. In 1952, the US Highway 66 Association unofficially named the road after a comedian of this ethnicity.
ANSWER: **Cherokee** [or **Tsalagi**; or **Anigiduwagi**; accept **Cherokee** Nation; prompt on Native American or Indigenous American] (The highway is unofficially named for Will Rogers.)
[10m] Hugh Davis built a massive blue whale and a re-creation of this object along Route 66 in Catoosa, Oklahoma. A Wisconsin waterpark that is the largest in the US is named for this object, which was re-created in Grant County, Kentucky, by the Creation Museum founder Ken Ham.
ANSWER: Noah's **Ark** [accept **Ark** Encounter]
<Geography>

18. Answer the following about the physical limits on a cell's ability to detect and absorb molecules based on Howard C. Berg and Edward M. Purcell's classic paper "Physics of chemoreception," for 10 points each.
[10m] The authors use an analogy between steady-state diffusion and this branch of physics to show that a relatively small amount of receptors are just as good at intake as a perfectly absorbing sphere. The first semester of E&M contains a treatment of this branch of physics in which source charges are stationary or move very slowly.
ANSWER: **electrostatics** [prompt on electromagnetism]
[10h] They demonstrate that local stirring to increase intake is feasible only for cells with a large enough value for this property. Forward scatter intensity is generally proportional to this quantity in flow cytometry.
ANSWER: cell **size** [accept cell **radius** or **diameter**; accept cell **volume**; accept cell **surface area**]
[10e] Their central result is a bound on the error in a cell's ability to measure this quantity due to statistical fluctuations. On the scale of cells, molecules move via diffusion down gradients in this quantity.
ANSWER: **concentration**
<Physics>

19. In this novel, the psychiatrist Anne Debreuilh ("duh-BROY") has an affair with an American writer, based on the author's affair with Nelson Algren. For 10 points each:
[10h] Name this novel, in which the newspaper editor Henri Perron argues with Robert, who founds the SRL.
ANSWER: *The **Mandarins*** [or *Les **Mandarins***]
[10e] *The Mandarins* was written by this author, who described the three-way relationship between Pierre, Xavière, and Françoise in *She Came to Stay*. This philosopher also wrote *The Second Sex*.
ANSWER: Simone de **Beauvoir** [or Simone Lucie Ernestine Marie Bertrand de **Beauvoir**]
[10m] Beauvoir's soon-to-be-published novel *The Inseparables* is based on recollections of her friend Zaza, who is described in her biography, titled *Memoirs of a Dutiful* [one of these people]. This is the last word in the title of a Eudora Welty novel centered on the death of Judge McKelva.
ANSWER: **daughter** [or **fille**; accept *The Optimist's **Daughter***; accept *Memoirs of a Dutiful **Daughter*** or *Mémoires d'une jeune **fille** rangée*]
<European Literature>

20. Theodore Beza and François de Tournon debated at an event organized by this woman in which Francis, Duke of Guise ("GEEZ"), and Anne de Montmorency banded in a Catholic "triumvirate." For 10 points each:
[10e] Name this queen mother of three French monarchs, who organized the Colloquy of Poissy in an attempt to reconcile Catholics and Huguenots. This Florentine woman instigated the Saint Bartholomew's Day Massacre.
ANSWER: **Catherine de' Medici** [prompt on Catherine; prompt on de' Medici]
[10h] The failed Colloquy of Poissy incited Huguenots led by Louis de Bourbon, Prince of Condé, to challenge Francis II's rule in a 1560 conspiracy named for this location. Catherine de' Medici signed an edict of pacification at this location in 1563, guaranteeing Huguenot religious freedoms after the first of the French Wars of Religion.
ANSWER: Château d'**Amboise** ("AHM-bwahz") [accept **Amboise** conspiracy; accept Edict of **Amboise**]
[10m] The peace ensured in the Edict of Amboise fractured when Louis, Prince of Condé, and this nobleman attempted to kidnap Charles IX in a plot termed the Surprise of Meaux ("moh"). This Huguenot nobleman was stabbed and then thrown out of a window during the Saint Bartholomew's Day Massacre.
ANSWER: Gaspard de **Coligny** ("gahs-PAR duh coh-lee-NEE") [accept Seigneur de **Châtillon**]
<European History>

Extra. The Shali Fortress was made from salt and rock near one of these geographical features in Siwa. For 10 points each:
[10e] Name these features, one of which supports the oldest pre-desertification city of Ghadames ("gah-DAM-ess"). The aquifers of these desert locales help sustain life for caravans and date palms.
ANSWER: **oasis** [or **oases**]
[10m] All of Africa's "Big 5" species of animals depend on oases in the Moremi Game Reserve created by this river's delta, which flushes water into Lake Ngami and the Boteti River in the Kalahari Desert.
ANSWER: **Okavango** ("oh-kuh-VAHN-go") River [accept **Okavango** delta]
[10h] This ethnic group depends on oases like Timia and Tessalit to support rare fruit growth. Members of this ethnic group take pilgrimages to the tomb of their queen Tin Hinan near Abalessa in the Hoggar Mountains.
ANSWER: **Tuareg** ("TWAH-reg") [or **Twareg** or **Touraeg**; or Kel **Tamasheq**; or **Imuhagh** or similar; prompt on Imazighen or Amazighs or Berbers]
<Geography>