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**Collaboration vIa Network (MRNA VACCINE)**

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**Packet 2: "His name is The Dr. Dr., not Dr. Dr. Who!"**

1. A forest fire is used to make this position "evidential" in an argument created by William L. Rowe. The "Courtier's Reply" inspired by *The Emperor's New Clothes* was coined to defend a book espousing this position. Anthony Flew argued that the soft form of this position should be interpreted in a negative sense before changing positions later in life. An argument for this position imagines an object too small to be seen by telescopes (\*) orbiting between Earth and Mars. An argument that supports this position if unresolved centers on a logical problem between the existence of suffering and the three principles of omnipotence, omnibenevolence, and omniscience. For 10 points, name this position supported by arguments like Russell's teapot and the problem of evil. ANSWER: atheism [or answers involving arguments against the existence of God; or against intelligent design] <Erik Christensen, Philosophy>

2. The four seasons structure a poetry collection in this language supposedly composed by "Lady Midnight." All even lines share the same rhyme in this language's eight line "regulated verse" form. Two lines in this language appear as "entering these deep woods, late sunlight / flares on green moss again, and rises" in a David Hinton translation. A repetitive modern poem in this language written as a linguistic demonstration translates as "Lion-Eating Poet in the Stone Den." After supposing there is frost on the ground, the speaker of a poem in this language (\*) bows his head and thinks of home. An anthology of 300 poems in this language contains entries like "Deer Park" and "Quiet Night Thought." For 10 points, name this language used in poetry by Wang Wei ["wong way"] and Li Bai ["lee buy"].

ANSWER: Classical Chinese [or Literary Chinese; or wényánwén or gǔwén; do NOT accept or prompt on "Mandarin"] <Henry Atkins, World Literature>

3. **“BUILD” and “SWAP” steps characterize the P·A·M algorithm, which performs this task “around medoids.” Silhouette scores assess the quality of this task’s output. This task is performed on the rows of a matrix whose columns are the eigenvectors of a Laplacian matrix with the smallest nonzero eigenvalues in its “spectral” form. The expectation-maximization algorithm is used to implement a “soft” form of this task, in which results are assigned probabilistically, via (\*) Gaussian mixture models. “Average,” “complete,” and “single” linkages are used to measure distances between the products of this task in its “hierarchical” form.  $k$  points are chosen at random and then iteratively updated in the “ $k$ -means” form of this task. For 10 points, name this unsupervised machine learning task that involves placing similar observations into namesake groups.**

ANSWER: **clustering** [or any answer equivalent to **creating clusters**; or **clustering** algorithms; prompt on **classification**]

<David Bass, Other Science>

4. **In one story, this figure creates a servant out of wood, but is annoyed when the servant refuses food on his behalf. This figure turns a toy boat into a real one to avoid being drowned by his uncle. In a story depicted in a Bill Reid sculpture, this figure sings to a clamshell that makes strange noises in order to release the first humans. *The Hero with a Thousand Faces* cites a story in which this figure is eaten in the section “The Belly of the (\*) Whale.” He turns himself into a speck of dirt and is swallowed, in order to be reborn as a child who demands to play with the sun and the moon. This figure, who steals the sun, is originally white, but turns black when a fire is lit underneath him. For 10 points, name this trickster bird of Pacific Northwest Native American folklore.**

ANSWER: **Raven** [or **Crow**; or **Big-Crow**; or **Tse-sketco**; or **He'mask**; or **Txamsem**; or **We-gyet**; or **Nankil'slas**; or **Yehl**; or **Kwekwaxa'we**]

<Jaimie Carlson, Mythology>

5. **An early form of pottery in this region was the glossy ‘ripple ware’ of the Badarian Culture. A catfish and a chisel in a serekh represented the name of a king who ruled parts of this region during its Naqada III phase. That king, who may have ruled this region’s undiscovered city of Thinis, was called Min by Herodotus. A siltstone tablet shows a ruler of this region holding an enemy’s (\*) hair and preparing to smite him. An accessory known in Greek as the Pschent represented this region’s unity by combining a red vulture crown and a white cobra crown. The reign of a king named Menes or Narmer marks the end of this region’s Predynastic period. For 10 points, name this region whose “Lower” and “Upper” divisions were united by the first Pharaohs.**

ANSWER: Ancient **Egypt** [or anything with the consonants **kmt**; or Upper **Egypt**; or Lower **Egypt**; prompt on **North Africa**]

<Lia Rathburn, Other History>

6. *Description acceptable.* **In one organism, this property is conferred by mutations in R·p·o·B and Kat·G. An inducible version of this property is conferred by Amp·C in a set of organisms denoted SPACE·M. In another organism it occurs due to synthesizing D·ala·D·lac instead of D·ala·D·ala. The Kirby·Bauer method tests for this property by assuming a higher M·I·C is correlated with a smaller zone of inhibition. The S·C·C·mec element confers this property via a mutated (\*) P·B·P·2·A protein. Plasmids that confer this property are used with selective media to pick transformants. This property can be conferred by efflux pumps, mutated binding proteins, or beta·lactamases. The strain MRSA [“murr·suh”] has, for 10 points, what property of bacteria with decreased susceptibility to compounds like penicillin?**

ANSWER: antibiotic **resistance** [accept any answer with word forms of **resistance**, especially with specific antibiotics like rifampin, isoniazid, penicillin, beta·lactams, vancomycin, etc instead of just “antibiotic”; prompt on common·language equivalents like “they aren’t affected/killed by antibiotics”]

<Sharath Narayan, Biology>

7. A character in this location relates a dream where “close at mine ear one called me forth to walk/ with gentle voice.” While traveling [*emphasize*] to this location, a character encounters a Scylla-like “portress” made up of serpents and barking dogs below the waist. A character in this location warns against too much inquiry when asked about celestial motions, and explains the ordering of the universe in a long didactic conversation. After journeying through (\*) chaos and the outermost spheres, a disguised character learns of this location’s whereabouts from Uriel. Two characters walking hand-in-hand take “their solitary way” out of this location after gaining knowledge of good and evil. For 10 points, name this biblical location that is “lost” in an epic by John Milton.

ANSWER: The Garden of Eden [accept either underlined portion; or Paradise; prompt on Earth]  
<Henry Atkins, British Literature>

8. Lynne Schreiber’s book *Hide and Seek* describes rituals around this substance originating from the Sotah ritual, in which this object is used in adultery trials. Nazarites must destroy this substance within seven days of interacting with a corpse. It’s not wine, but because Rabbi Akiva’s students failed to show respect to one another, a ceremony involving this substance occurs on Lag B’Omer in Israel at Bar-Yochai’s grave. Children lick honey-covered Hebrew letters after taking part in the upsherin ritual at three years old, which involves this substance. A (\*) sheitel or a scarf called a tichel typically covers this substance in Orthodox communities. The Torah prohibits “rounding off” pe’ah, which is interpreted as this substance in front of the ears in the tradition of payot. For 10 points, a kippah rests atop what substance on a Jewish man’s head?

ANSWER: human hair [or clear-knowledge equivalents or synonyms such as long hair; or hair curls; or sideburns; prompt on pe’ah before mention; prompt on the head before mention]  
<Ganon Evans, Religion>

9. Characters created by this author are depicted in a series of twelve engravings created by John Hamilton Mortimer. An art gallery intended to showcase paintings inspired by the work of this author was opened by John Boydell. A ghost-like woman moves from right to left towards a trembling man against a solid black background in a painting inspired by the work of this author by Henry Fuseli. A portrait believed to depict this author is attributed to John Taylor and was once owned by the Duke of (\*) Chandos. Many paintings inspired by this author’s work portray David Garrick. A woman modeled on Elizabeth Siddall lies in a stream in a painting inspired by a play by this author. For 10 points, what author’s plays inspired paintings such as John Everett Millais’ *Ophelia*?

ANSWER: William Shakespeare [or “William” “”””Shakespeare””””” said very curiously]  
<Chandler West, Painting/Sculpture>

10. A political cartoon from this election year depicts a jockey consoling a man late to a foot race. This election year was the *first* in which “The Hunters of Kentucky” was used as a campaign song. This was the last election *before* the beginning of the Second Party System, in which Republicans named for this election’s winners merged into the Whigs. The last congressional nominating caucus was held in this election year, but lost credibility for selecting a Georgia senator paralyzed by a stroke named William (\*) Crawford. The winner of this election did not win the popular nor electoral vote, and rewarded Henry Clay’s vote wrangling in the House with a Secretary of State nomination. For 10 points, name this election in which a “corrupt bargain” caused Andrew Jackson’s loss to John Quincy Adams.

ANSWER: 1824 [or election of 1824; or 1824 United States presidential election, etc.]  
<Chandler West, American History>

11. A recent derivation of the quantum version of this phenomenon by Smith and Ahmadi considered superpositions of particles with a single degree of freedom under the Page-Wootters formalism. One test of this phenomenon used detectors at Echo Lake and Denver to measure the number of atmospheric muons at two different elevations. This phenomenon can be derived by considering a vertical beam of light bouncing between two mirrors, then considering the same system when the mirrors (\*) move horizontally. This phenomenon's kinetic and gravitational forms both contribute to a small error in GPS satellites. Considering this phenomenon's effect on a person taking a round-trip on a fast rocket leads to the twin paradox. For 10 points, name this effect predicted by special relativity, in which moving clocks run more slowly.

ANSWER: time dilation

<Eric Mukherjee, Physics>

12. In this language, the neutral pronoun *ri* is often used to refer to non-binary individuals. Antonyms in this language can be derived by inserting the prefix "mal-". The circumflexes found on this language's four postalveolar consonants are replaced with digraphs in its dialect called Ido, which means "offspring" in this language. A failed (\*) 1894 reform of this language proposed eliminating all definite articles. Stage One of the Paderborn model for language instruction recommends teaching this propaedeutical ["pro-pay-DEW-tick-ul"] language first. Leo Tolstoy purportedly took only 4 hours to learn this language, whose grammar was first described in the book *Unua Libro* by the Polish doctor L. L. Zamenhof in 1887. A green five-pointed star symbolizes, for 10 points, what constructed language?

ANSWER: Esperanto

<Sharath Narayan, Social Science>

13. People working in this profession used part of their pay to fund the Chatham Chest, which provided disability pensions until its merger with a retirement home in Greenwich. In 1797, people of this profession rebelled in southern England to abolish the "purser's pound" because their rate of pay had not increased for decades. During the 18th century, British people in this profession were supplied food and drink by the Victualling Board, which often included servings of (\*) hard tack and citrus fruit. Many men of this profession led by Fletcher Christian that were transporting breadfruit settled in Tahiti after rebelling against William Bligh. For 10 points, name this profession of the men who participated in the Mutiny on the Bounty.

ANSWER: Royal Navy sailor [or seaman; or other equivalents]

<Erik Christensen, European History>

14. Near the beginning of this novel, a woman steps into her future husband's shoes the first time she meets him. The protagonist of this novel drifts away from his wealthy girlfriend Maxine after his father dies suddenly of a heart attack while in Cleveland for research. A French academic has an affair with Moushumi, the wife of this novel's protagonist. A character in this novel names his son after an (\*) author he was reading when he had a near-death experience in a train wreck. When he begins college at Yale, this novel's protagonist decides to begin going by Nikhil, a name his parents tried to get him to use when he began kindergarten. For 10 points, name this novel about the immigrant Ganguli family and their son Gogol, written by Jhumpa Lahiri.

ANSWER: *The Namesake*

<Chandler West, American Literature>

15. In a 2019 essay, critic J. Hoberman argues that the popularity of this film genre in the U.S. coincided with a growth in cynicism and the decline of the Western. In a film in this genre, the camera zooms in on a teary-eyed priest's face as a man off-screen "goes yellow" and pleads not to be executed. A film in this genre ends with a shot that wipes right of a woman looking at her husband as one of his friends closes a (\*) door. Many films from this genre's first peak in the 1930s, such as *Angels with Dirty Faces*, starred James Cagney. The line "I believe in America" opens a 1972 film in this genre that begins with the wedding of a main character's daughter. For 10 points, name this genre of Francis Ford Coppola's trilogy of *Godfather* films.

ANSWER: gangster films [or crime; or mob; or mafia films]

<Erik Christensen, Other Fine Arts>

16. The first poem in a collection by this author opens by describing how "a hare halted in the clover / As soon as the idea of the flood was finished." This author described their life as "one long party where all / hearts were open wide" at the beginning of a long poem. The speaker of a poem by this author proclaims "I miss Europe with its ancient parapets!" and describes striking against "unbelievable Floridas." This author wrote a collection of (\*) *Illuminations* and a poem about a "mad virgin" and a "hellish husband." After being shot in the wrist, this poet wrote a long prose poem that contains "Bad Blood" and two "Delirium" sections. For 10 points, name this French poet, a lover of Paul Verlaine, who wrote the poems "The Drunken Boat" and *A Season in Hell*.

ANSWER: Arthur Rimbaud ("Rem-boh") [or Jean Nicholas Arthur Rimbaud]

<Chandler West, European Literature>

17. Hydrofluorocarbon refrigerants with these structures added have greatly reduced global warming potential. In a variant of the pinacol ["PIN-uh-call"] coupling, titanium(III) chloride reductively couples carbonyls to form these structures in the McMurry reaction. Complexes of transition metals to these structures are described by the Dewar-Chart-Duncanson model. Platinum is covalently bonded to three chlorine atoms and complexed to one of these structures in Zeise's salt. Schrock and Grubbs catalysts make two compounds with these structures (\*) exchange parts in a namesake metathesis. Since these structures can't rotate, they may display configurational isomerism denoted E-Z or cis-trans. Fatty acids with these structures have a bent shape and are called "unsaturated." For 10 points, name this functional group consisting of a carbon-carbon double bond.

ANSWER: alkenes [or olefins; before mentioned, accept carbon-carbon double bonds or C-C double bonds and prompt on double bonds or pi bonds; do NOT accept or prompt on "alkanes" or "alkynes"]

<Gerhardt Hinkle, Chemistry>

18. The fifth symphony by a composer from this country includes a vocal reciter speaking the Lord's Prayer—that symphony subtitled "Amen" was composed by "the lady with the hammer." Each of the twelve movements of a symphony from this country called *Stimmen Verstummen* have lengths derived from the Fibonacci sequence. The [read slowly] E-A-E-D-A theme was used to represent a student of one composer from this country named (\*) Elmira in his tenth symphony. The fifth symphony by that composer from this country opens with rising and falling minor sixths and was written as a "creative response to justified criticism" following accusations of not conforming to socialist realism. For 10 points, name this country home to Sofia Gubaidulina and Dmitri Shostakovich.

ANSWER: Russia [or Rossija or Soviet Union or USSR or CCCP] (The first composer mentioned is Galina Ustvolskaya.)

<Aidan Fein, Classical Music>

19. Anthropologist David Graeber details the call and response used by people gathered in this place during an event that inspired the first chapter of his book *The Democracy Project*. In this place, Betsy Fagin operated the People's Library before its collection was loaded into garbage trucks. After their first two options were sealed off, people began gathering in this place on September 17 after the magazine *Adbusters* created a poster saying "bring a tent." Protesters who gathered in (\*) Zuccotti Park within this place began an international movement that popularized the phrase "we are the 99%" until evicted by police a month after calls to vacate from Mayor Bloomberg. For 10 points, name this district and thoroughfare in New York City, the epicenter of the 2011 Occupy movement.

ANSWER: Wall Street [or Occupy Wall Street; accept Zuccotti Park until read; prompt on New York or Manhattan by asking "what specific place within the city?"]

<Erik Christensen, Other>

20. This leader's ideology derived from a concept known as "Westoxication." This leader spent several months in the French village of Neauphle-le-Château ["NOFE-ell le sha-toe"] while communicating to their followers through cassette tapes. In a 1971 polemic, this leader denounced an "illegitimate festival" occurring in their home country and called for their place of exile, Najaf, to "awaken!" The translator Hitoshi Igarashi was murdered as part of a (\*) fatwa this leader issued regarding the Salman Rushdie book *The Satanic Verses*. After their forces took 52 people in an American embassy hostage, this leader denounced the United States as the "Great Satan." For 10 points, name this man who overthrew Reza Shah Pahlavi and became Supreme Leader of Iran in 1979 while holding the rank of Grand Ayatollah.

ANSWER: Grand Ayatollah Sayyid Ruhollah Musavi Khomeini

<Lia Rathburn, World History>

1. A 1974 video essay examines one of the most prolific creators of this type of artwork, Elmyr de Hory, comparing his output to Chartres Cathedral. For 10 points each:

[10m] Identify this type of artwork. Hermann Göring traded 147 looted paintings for an artwork with this quality made by Han van Meegeren.

ANSWER: **forgeries** [or equivalents like **fake works of art**; or **F for Fake**] (Göring traded 147 paintings for “Vermeer’s” *The Supper at Emmaus*.)

[10e] Art dealer Tatiana Khan commissioned a friend to forge a work by this artist after the original was stolen, and then sold that forgery for \$2 million. This Cubist master had “Blue” and “Rose” periods.

ANSWER: Pablo **Picasso** [or Pablo Diego José Francisco de Paula Juan Nepomuceno María de los Remedios Cipriano de la Santísima Trinidad Ruiz y **Picasso**]

[10h] In this BBC series, John Berger argues that “genuineness” and market value drive much of the experience we feel when viewing great works of art. This series and a book of the same name popularized the term “male gaze.”

ANSWER: ***Ways of Seeing***

<Henry Atkins, Painting/Sculpture>

2. George Price and this biologist presented a scenario in “The Logic of Animal Conflict” in which players can either be a hawk or dove with the pay-off expressed in terms of the value of the contested resource and the cost of a fight. For 10 points each:

[10h] Name this British geneticist who formulated the notion of an evolutionarily stable strategy.

ANSWER: John Maynard **Smith**

[10e] The hawk-dove formulation is a model in the evolutionary version of this economics subfield. The prisoner’s dilemma is a scenario in this discipline where players’ strategies are either to defect or remain silent.

ANSWER: **game** theory

[10m] Smith postulated a two-fold cost of this ability. Muller’s ratchet may explain why this ability evolved, because it prevents the accumulation of deleterious mutations.

ANSWER: **sexual** reproduction

<Vishal Puppala, Biology>

3. This historian’s [*emphasize*] nephew constructed a stele [“stel-uh”] now housed in the Louvre that depicts a victory over the Lullubi tribe. For 10 points each:

[10h] Name this priestess who chronicled Lugalanne’s revolt against her father, Sargon the Great. This aunt of Naram-Sin is the earliest known author in history.

ANSWER: **Enheduanna**

[10m] Enheduanna was briefly expelled from this city during Lugalanne’s revolt. This city’s “Great Ziggurat” was excavated by Leonard Woolley.

ANSWER: **Ur** [reject “Uruk”]

[10e] Enheduanna lived during the reign of this Mesopotamian empire, considered the first in world history. Sargon the Great founded this empire after defeating Lugalzagesi, the king of Sumer.

ANSWER: **Akkadian** Empire

<Owen Riley, Other History>

4. The protagonist of this novel gets beaten up by a group of teenagers after playing a punching game in an arcade. For 10 points each:

[10m] Name this short Kenzaburō Ōe ["oh-ay"] novel in which the protagonist Bird goes on a drinking binge and attempts to find an abortion clinic for his already-born, brain-herniated child.

ANSWER: *A **Personal Matter*** [or ***Kojinteki na taiken***]

[10e] Ōe ["oh-ay"] won this award in 1994. Ōe's countryman Yasunari Kawabata also won this prize, awarded annually by the Swedish Academy for an author's body of work.

ANSWER: **Nobel** Prize in **Literature** [prompt on just **Nobel**]

[10h] *A Personal Matter* begins with Bird purchasing one of these items while his wife is giving birth. This item recurs throughout the novel as a symbol of a dream Bird believes is dead due to the birth of his child.

ANSWER: a **map** of **Africa** [or **maps** of specific regions like West or Central **Africa**; anti-prompt (ask "can you be less specific?") on **maps** of specific African countries; prompt on partial answers]

<Chandler West, World Literature>

5. Zvi Griliches ["GRILL-i-kus"] found farmers adopted the "hybrid" version of this crop in an economically rational way in a 1957 paper. For 10 points each:

[10m] Name this crop. Henry Wallace sold seeds of this crop before his political career.

ANSWER: **corn** [or **maize**]

[10e] Griliches modeled the diffusion of hybrid seed with this kind of curve. This curve also describes population growth that starts nearly exponential and flattens out as the carrying capacity is reached.

ANSWER: **logistic** curve [prompt on "**S-shaped** curve"]

[10h] In 2016, Monsanto commercialized corn tolerant of glyphosate, glufosinate, and this controversial herbicide. This herbicide's vapor pressure makes it prone to drift on neighboring fields where it can cause serious damage.

ANSWER: **dicamba** [or **Clarity**; or **Banvel**; or **DiFlexx**; prompt on **Status** or **Marksman**]

<Sam Bailey, Social Science>

6. One woman from this group's folklore sticks her future husband in her pocket after defeating him in battle. For 10 points each:

[10h] Name this system of folklore. Another warrior queen from this group's folklore imprisons a wizard in the tallest turret of her castle, only for him to escape after her husband brings him three pails of water.

ANSWER: **Slavic** folklore [accept any individual country in Slavic folklore: **Russian**, **Polish**, **Ukrainian**, **Czech**, **Serbian**, **Belarussian**, **Bulgarian**, **Croatian**, **Slovakian**, **Bosnian**, **Slovenian**]

[10e] The warrior Nastasya Mikulishna ["me-koo-leesh-nuh"] gets married to Dobrynia Nikitich, who is a *bogatyř* ["BOG-a-teer"], a heroic Russian one of these people. British examples of these people include Kay and Galahad.

ANSWER: **knights-errant** [accept **bogatyřs** or **bogatyřka**s before mention; or **Knights** of the Round Table; prompt on **fighters**, **warriors**, or other equivalents]

[10m] Marya Morevna imprisons this man, who subsequently kidnaps her. This immortal sorcerer hides his soul in a needle in an egg in a duck in a chest on an island.

ANSWER: **Koschei** the Deathless [or **Kashchei** the Immortal]

<Jaimie Carlson, Mythology>



7. Workers in this industry struck under the slogan "I AM a Man." For 10 points each:

[10m] Name this industry, whose workers began striking in response to the deaths of Echol Cole and Robert Walker. Martin Luther King Jr. was in Memphis supporting the strike in this industry in 1968 when he was assassinated.

ANSWER: **sanitation** industry [or **garbagemen**; or any other answers suggesting **garbage** collection; or Memphis **sanitation** strike]

[10e] In the 1830s, this state's future capital prohibited the killing of vultures since they ate trash. The Wheeling Convention led to this state's creation, whose population struggles with black lung due to its coal-heavy economy.

ANSWER: **West Virginia** [or **WV**]

[10h] At a 1969 event in this city, protestors threw bras and makeup into a "Freedom Trash Can." Lenora Slaughter's "rule seven" segregated that event in this city, which was also the site of the segregated Chicken Bone Beach.

ANSWER: **Atlantic** City

<Chandler West, American History>

8. Adorno and Horkheimer used this term to describe the replacement of use value with exchange value in products which formerly had a genuine character. For 10 points each:

[10h] Name this concept, which titles a chapter of *Dialectic of Enlightenment* about a complex that fetishizes the social valuation of products that were formerly purposeless.

ANSWER: **culture industry** [or **Kulturindustrie**]

[10e] *Dialectic of Enlightenment* compares the culture industry with more forceful social control in Stalinism and this ideology. A government of this ideology denounced "degenerate art" and produced the film *Triumph of the Will*.

ANSWER: **fascism** [or **national socialism**; or **Nazism**]

[10m] *Word forms acceptable*. Adorno and Horkheimer argued that the Enlightenment over-emphasis on this quality led to technocratic movements. Max Weber argued that bureaucratic practices with this quality replacing religious traditions led to the "iron cage of modernity."

ANSWER: **rational** [or **rationality**; or **rationalization**; or other word forms; or answers like **overational** or word forms]

<Erik Christensen, Philosophy>

9. In a story by this author, a member of the Blue Veins society plans to propose to Molly Dixon. For 10 points each:

[10h] Identify this author, who wrote a story which ends with the light-skinned Mr. Ryder acknowledging 'Liza Jane as his wife from when he was enslaved.

ANSWER: Charles W(addell) **Chesnutt** (The unnamed story is "The Wife of His Youth.")

[10e] Another Chesnutt story is about a cursed vine that this fruit grows on, which the formerly enslaved Julius McAdoo advises a white couple not to buy. In a John Steinbeck novel titled for this fruit, the Joads travel to California to escape the Dust Bowl.

ANSWER: **grapes** [or "The Goophered **Grapevine**"; or *The **Grapes** of Wrath*]

[10m] This literary critic was a staunch supporter of Chesnutt's work. This author also wrote a novel which details the paint magnate Silas Lapham's attempts to marry one of his daughters to Tom Corey.

ANSWER: William Dean **Howells**

<Chandler West, American Literature>

10. A graph is called critical if removing any edge or vertex decreases this quantity. For 10 points each:  
[10m] Name this quantity. A graph's value for this quantity is greater than or equal to the size of its maximal clique, since this value for a complete graph is equal to its number of vertices.

ANSWER: **chromatic** number

[10e] In 1976, Appel and Haken proved that the chromatic number of any simple planar graph is at most this number. Any map can be colored with this many colors such that no two neighboring regions share a color.

ANSWER: **four** [or **four** color theorem]

[10h] Solving the Hadwiger-Nelson problem, which asks about coloring the plane, involves finding the chromatic number of graphs of this type. The Moser spindle is the smallest graph of this type with a chromatic number of four.

ANSWER: **unit distance** graphs [or answers indicating that all the graph's **edges have unit length**]

<Beni Keown, Other Science>

11. Answer the following about evangelism in South Korea, for 10 points each:

[10e] A plurality of the country's Protestants are members of this movement, which has its origins at the Azusa Street Revival and includes practices such as speaking in tongues and baptism in the Holy Spirit.

ANSWER: **Pentecostalism**

[10m] South Korea is home to a "prayer movement" named for these landforms. Dominion theology describes education and family as seven of these locations in a "mandate" required for Christ to return to Earth.

ANSWER: **mountains** [or the Prayer **Mountain** movement; or the Seven **Mountain** Mandate]

[10h] South Korea is home to this largest megachurch in the world, which preaches the "Threefold Blessings of Salvation." A video of its head pastor, Young Hoon Lee, stating that a card would fend off COVID-19 has gone viral.

ANSWER: **Yoido** Full Gospel Church

<Ganon Evans, Religion>

12. In February 2021, this leader's government became embroiled in scandal regarding sexual assault and misogyny after the allegations of a junior staffer against a former Defence Minister. For 10 points each:

[10m] Name this leader of the Liberal/National Coalition, who became Prime Minister of his country during a leadership spill in 2018.

ANSWER: Scott **Morrison** [or **Scomo**]

[10e] Morrison was criticized for his response to a series of these events peaking in December 2019. Many eerie pictures of an orange sky were taken in California during an intense period of these events in July and August 2020.

ANSWER: **fires** [or bush**fires**; or wild**fires**; or forest **fires**]

[10h] Morrison pledged an independent investigation to this leader of the Opposition, who has called for women in his own party to come forward and identify abusers. This politician lost a leadership contest to Bill Shorten in 2013.

ANSWER: Anthony **Albanese** [or **Albo**]

<Erik Christensen, Other>

13. The infinitesimal changes in this quantity is equal to  $T dS$  minus  $P dV$ . For 10 points each:

[10m] Name this quantity whose change for a closed system is equal to the heat transferred to the system minus the work done by the system.

ANSWER: **internal energy** [or **U**; prompt on **energy**]

[10e] The aforementioned expression for the internal energy of a closed system is one way of expressing this law, a version of the law of conservation of energy applied to thermodynamics.

ANSWER: **first law** of thermodynamics.

[10h] The change in internal energy equals  $\delta Q$  minus  $P dV$  for this idealized kind of process, which occurs so slowly that the system remains in equilibrium throughout.

ANSWER: **quasistatic** process

<Eric Mukherjee, Physics>

14. The archeological site of Taruga contains evidence of iron-smelting by this culture. For 10 points each:

[10h] Name this culture founded in present-day Nigeria that created feline humanoid forms of pottery. Clay figures from this pearl millet growing-culture were unearthed and used as scarecrows in yam fields in the early 1900s.

ANSWER: **Nok** culture

[10e] The Nok culture created large life-sized sculptures of humanoid forms using this material. This material was used to create the soldiers, chariots, and horses of an “army” in the tomb of Qin Shi Huang.

ANSWER: **terracotta** [or the **Terracotta** Army; or **hóng táo**]

[10m] Nok terracotta figurines have led archeologists to hypothesize that they are the ancestors of this ethnic group. Obas of this ethnic group ruled the Oyo Empire, which failed to conquer the Edo states of Benin.

ANSWER: **Yoruba**

<Vikshar Athreya, World History>

15. A poem titled for this quality tells the addressee to “murmur, a little sadly, how Love fled /... and hid his face amid a crowd of stars.” For 10 points each:

[10m] Name this quality. A speaker who describes himself as “a tattered coat upon a stick” embarks on a voyage to a “holy city” because he has this quality.

ANSWER: being **old** [or equivalents like being **aged**; or “When You are **Old**”]

[10e] This Irish poet of “When You Are Old” wrote “that is no country for old men” in “Sailing to Byzantium.”

ANSWER: William Butler **Yeats** (“yates”)

[10h] This poet wrote that to be old is to “to hear the world applaud the hollow ghost / which blamed the living man” in “Growing Old.” This poet and critic used his father’s sermons as material for the elegy “Rugby Chapel.”

ANSWER: Mathew **Arnold**

<Conor Thompson, British Literature>

16. A revolt on September 3, 1843 forced this country’s first king Otto to accept a constitution, but he would interfere in the government for another twenty years before being deposed. For 10 points each:

[10e] Name this country, whose War of Independence with the Ottoman Empire in the 1820s was won after France and the UK intervened at the Battle of Navarino.

ANSWER: Kingdom of **Greece** [or **Hellas**]

[10h] Otto’s successor George was offered the title King of the Hellenes by followers of this irredentist concept that sought to revive the Byzantine Empire. The “Enosis” sought by Greek Cypriots is inspired by this concept.

ANSWER: **Megali Idea** [or the **Great Idea**]

[10m] During the reign of Otto, the Greek church gained a degree of autocephaly from the holder of this position. Another holder of this position did not recognize the Bulgarian Exarchate after the country gained independence.

ANSWER: Ecumenical **Patriarch** of **Constantinople** [prompt on **patriarch**]

<Erik Christensen, European History>

17. Out of Debussy's three late chamber works, his one for this ensemble is acknowledged to strongly reflect his earlier style, and it opens with a rather non-pastoral Pastorale. For 10 points each:

[10h] *Three answers required.* Name this unusual trio used for the first of Debussy's "sonatas for diverse instruments." It became a standard chamber ensemble, with later pieces including Takemitsu's *And then I knew 'twas Wind*.

ANSWER: **flute**, **viola**, and **harp** [accept in any order; do NOT accept or prompt on partial answers or on answers that also include additional instruments]

[10m] Another standard chamber ensemble was established by this piece that uses flute, clarinet, violin, cello, piano, and a vocalist using Sprechstimme ["SHPRECK-shtim-uh"]. This Schoenberg piece sets 21 poems about a commedia dell'arte character.

ANSWER: **Pierrot lunaire** ("pee-air-OH loo-NAIR") [or *Dreimal sieben Gedichte aus Albert Girauds "Pierrot lunaire"*; or *Three times Seven Poems from Albert Giraud's "Pierrot lunaire"*; prompt on *Pierrot* ensemble]

[10e] The horn trio, consisting of horn, violin, and piano, was popularized by an E-flat major piece by this Romantic composer. The first symphony by this composer of a famous "lullaby" was nicknamed "Beethoven's tenth."

ANSWER: Johannes **Brahms**

<Gerhardt Hinkle, Classical Music>

18. Pascal's triangle can be used to determine the splitting pattern caused by this phenomenon. For 10 points each:

[10m] Name this phenomenon also called J-coupling, which in one technique usually only occurs between hydrogens attached to adjacent non-equivalent carbons.

ANSWER: **spin-spin** splitting [or **spin-spin** coupling; or **indirect dipole-dipole** coupling; prompt on **dipole-dipole** coupling or **dipolar** coupling or **dipole** coupling]

[10e] Spin-spin coupling is a feature of this form of spectroscopy, which uses a strong magnetic field to probe molecular structure. Hydrogen-1 and carbon-13 are common target nuclei in this technique.

ANSWER: **NMR** spectroscopy [or **nuclear magnetic resonance** spectroscopy]

[10h] This equation says the coupling constant J equals A times the cosine squared of the dihedral angle plus B times the cosine of the dihedral angle plus C. It's used to find the angles of the carbon backbone in protein NMR.

ANSWER: **Karplus** equation

<Eric Mukherjee, Chemistry>

19. In *Too Loud a Solitude*, a novel written by an author from this country, the protagonist smuggles large amounts of books home from his job. For 10 points each:

[10m] Name this country. In another novel written by an author from this country, the protagonist loses his job as a surgeon because of an editorial he wrote comparing the government to Oedipus.

ANSWER: **Czechoslovakia** [or **Czech** Republic; or **Czechia**] (The other novel is *The Unbearable Lightness of Being* by Milan Kundera.)

[10h] The protagonist of this novel, Herr Doktor Peter Kien, sleeps on a small divan so that his apartment has more room for his massive private library, which he believes is the largest in the city and values more than people.

ANSWER: **Auto-da-Fé** [or *The **Blinding***; or *Die **Blendung***; or *The **Tower of Babel***] (by Elias Canetti.)

[10e] Jorge of Burgos commits suicide by eating the poisoned pages of Aristotle's *Poetics* and setting a library on fire in this author's novel *The Name of the Rose*.

ANSWER: Umberto **Eco**

<Chandler West, European Literature>

20. Alicia Keys used this technique to play Joplin's "Maple Leaf Rag" at the 2019 Grammys as a nod to Hazel Scott, who notably used this unusual technique. For 10 points each:

[10h] Identify this technique, which Scott used to play her song "Black & White Are Beautiful." Cory Henry used this technique for portions of his solo on Snarky Puppy's "Lingus," while Bill Evans used this technique on his album *From Left to Right*.

ANSWER: Playing **two pianos** simultaneously [accept **keyboards** in place of pianos; prompt on playing two instruments simultaneously with "which instrument?"]

[10e] Earlier in his career, Evans played on Oliver Nelson's album titled for this genre *and the Abstract Truth*. This genre, developed from African-American work songs and spirituals, typically takes a 12-bar form.

ANSWER: **blues** [or *The **Blues** and the Abstract Truth*]

[10m] Evans's "Amen" chord on the tune "So What" consists of a major third stacked on top of three of this interval, making it essentially the bottom five strings of a guitar. This interval has a just intonation ratio of 4:3.

ANSWER: perfect **fourth**

<Aidan Fein, Other Fine Arts>