

**2022 Medium RaNge Academic, a Vanderbilt and Company  
Collaboration vIa Network (MRNA VACCINE)**

**Edited by: Eric Mukherjee (head), Erik Christensen, Chandler West, Conor Thompson, Ganon Evans, Henry Atkins, Jaimie Carlson, Sam Bailey, Chris Sims, Jacob O'Rourke, and William Grossman**

**Written by: The Editors, Gerhardt Hinkle, Vikshar Athreya, Andrew Hanna, David Bass, Owen Riley, Lia Rathburn, Beni Keown, Vishal Puppala, Aidan Fein, Jacob Augelli, Liam Thompson, Will Alston, Michael Borecki, Sharath Narayan, Zachary Beickman, Rebecca Thomas, Bryanna Shao, and Willie Chen**

**Packet 5: "I saw the Figure 5 in Gold Digger"**

1. PaRSnIP ["parsnip"] and the scoring card method are used to predict whether proteins have this property, which around 30% of recombinant proteins lack. The square root of the heat of vaporization minus  $R \cdot T$  all over molar volume gives a parameter that characterizes this property. The curve of this property versus temperature for cerium chloride is unusually downward sloping. Proteins that lack this property are usually purified by adding chaotropes and zwitterionic detergents, which allows them to be extracted and (\*) refolded from inclusion bodies. The ratio of the extent of this property between two phases gives the partition coefficient, which is used for liquid-liquid extractions. All nitrites have this property, while most hydroxides lack it and thus precipitate. For 10 points, name this property of certain compounds which allows them to dissolve in a solvent. ANSWER: solubility [or word forms; or insoluble due to the first line]

<Eric Mukherjee, Chemistry>

2. In a novel primarily set in this city, a doctor reflects on how Nietzsche imitated Mucius Scaevola after Moji reminds him of how he sexually assaulted her at a party 20 years prior. The documentary *The 50 Year Argument* narrates the history of a magazine based in this city. The only surviving shop from this city's old "Book Row" is the massive Strand Bookstore. This city names a company that often publishes previously untranslated and out-of-print novels under its "Classics" imprint, as well as an (\*) oft-abbreviated literary magazine. During "the summer they electrocuted the Rosenbergs," Esther Greenwood interns at a magazine in this city in Sylvia Plath's *The Bell Jar*. For 10 points, name this city whose publishers include Columbia University Press.

ANSWER: New York City [or NYC; or New York Review of Books; or NYRB] (The first sentence is from Teju Cole's *Open City*; *The 50 Year Argument* was directed by Martin Scorsese.)

<Henry Atkins, American Literature>

3. *Description acceptable.* Ali's quote that "following the middle path is a virtue" originally referred to performing this action. The *awrah* used to perform this action can be used in public if women feel comfortable by practicing the *tilawa* beforehand. Muhammad claimed performing this action once grants ten good deeds and wipes ten bad deeds. Its main performance is split between the seven *mutawatir* and three *mashhur* interpretations. Seven *ahruf* used to perform this activity were compiled into one Qurayshi (\*) dialect by 'Uthman. *Qira'at* and *Tajwid* are two guiding factors when performing this activity. A *hafiz* is someone who performs this activity from memory. For 10 points, name this process of reading an Islamic holy book.

ANSWER: reciting the Quran [accept any answers indicating somebody is reading or speaking the Quran; or memorizing the Quran; prompt on prayer with "What is the person doing while they pray?"]

<Ganon Evans, Religion>

4. This ruler sent three emotionally charged letters to Pope Celestine III asking him to intervene on behalf of their son. While on Crusade, this non-Capetian ruler supported their uncle Raymond of Antioch's plan to attack Aleppo, but a King of France forced them to travel to Jerusalem instead. This ruler was effectively put under house arrest for 16 years after backing a rebellion by their son (\*) Henry the Young King against their husband. This ruler raised 150 thousand marks to ransom their son after his capture by Duke Leopold of Austria. Shortly after the annulment of this ruler's marriage to Louis VII of France, she became the wife of his rival Henry II. For 10 points, name this woman whose son John, King of England inherited her Duchy of Aquitaine.

ANSWER: Eleanor of Aquitaine [or Aliénor of Aquitaine; prompt on Eleanor alone until "Aquitaine" is read]

<Lia Rathburn, European History>

5. While playing this genre, a drummer nicknamed "Klook" innovated the use of the "spang-a-lang" rhythm and the use of bass drum accents as "bomb drops." Many musicians who developed this genre held jam sessions at Minton's Playhouse. A forerunner to this genre, a mostly improvised version of *Body and Soul*, was recorded for RCA by Coleman Hawkins. Horace Silver and Art Blakey incorporated blues and gospel into a (\*) "hard" offshoot of this genre after forming the Jazz Messengers, who would record a version of one its standards called *A Night in Tunisia*. The standard *Ornithology* was written by a musician in this genre who gave the legendary club *Birdland* its name. For 10 points, name this fast and complex style of jazz music pioneered by Dizzy Gillespie and Charlie Parker.

ANSWER: Be**op** [or **bop**; or hard **bop**; prompt on jazz]

<Erik Christensen, Other Fine Arts>

6. In an introduction to a Penguin edition of this novel, Doris Lessing argues for reading it as a powerful statement against World War I. This novel's author denounced pirated editions of it in his "A Propos of [this novel]." While trying to make fun of a man's dialect, a character in this novel incorrectly says "Mun I" instead of "Maun ah." A character in this novel is seen standing in a driveway in the middle of the night by the caregiver Mrs. (\*) Bolton. The husband of this novel's title character owns the Wragby mansion and is paralyzed from the waist down. This novel begins "Ours is essentially a tragic age, so we refuse to take it tragically" and was the subject of a landmark 1960 obscenity trial. For 10 points, name this novel about Constance's affair with the gamekeeper Mellors, written by D.H. Lawrence.

ANSWER: Lady Chatterley's Lover

<Chandler West, British Literature>

7. This ethnic group developed a game in which a blunted javelin was thrown at opponents called *jereed*, masters of which are called *jigit*. The Tibetan *Drugu Rus Dgu* describes an alliance of this ethnic group called the “Nine Bones.” Matthias Alexander Castrén named a nationalist philosophy around Altaic speakers and this ethnic group for the Turan Depression. This ethnic group built fluted domes after they conquered the city of Merv in the 11th century. The “16 States” popularized by nationalists from this ethnic group include the (\*) Ghaznavids. The Ashina clan of this ethnic group preceded the Pechenegs, who spoke the Oghuz branch of their language. After a victory by Alp Arslan at Manzikert, this ethnic group created the Sultanate of Rum. For 10 points, name this nomadic ethnic group of Central Asia which created the Seljuk Sultanate.

ANSWER: Turks [or Gök-Turks or Celestial Turks or Blue Turks; accept Türük Bodun or Tüjué or Kök Türük or Türkler; accept Ashina before “Ashina”; accept Oghuz Turks or Seljuk Turks before mention; accept Turkic peoples; prompt on Oghuz before read]

<Ganon Evans, World History>

8. One work argues that this action should be done when a character attains good fortune, but not when a young woman is enraged or deceived. A woman refuses to perform this action and insists on becoming a nun with a magic begging bowl in *Manimekalai* [“ma-nee-MAY-ka-lai”], one of the Five Great Tamil Epics. After goddesses do this in front of Nara and Narayana, Urvashi is born out of Narayana’s thigh; she becomes the most famous of the *apsaras*, who are known for doing this, unlike their husbands the *gandharvas*. The 108 *karanas* of this practice are described in the (\*) *Natya Shastra*. A divine form of this action is known as *tandava*. Shiva is often depicted as the “Lord of [this action],” which he is frequently depicted doing in sculpture as he tramples on a dwarf. For 10 points, *mudra* hand gestures may be used in what classical Indian art form?

ANSWER: dancing [or word forms; accept tandava or tandava natyam BEFORE mention but prompt after mention; accept more specific kinds of classical Indian dance such as Bharatanatyam; or Kathak; or Kathakali; or Kuchipudi; or Odissi; or Manipuri; or Mohiniyattam; or Sattriya] (Note: the *apsaras* are dancers and the *gandharvas* are singers.)

<Jaimie Carlson, Mythology>

9. Intervals generated by this algorithm obey the parenthesis theorem. When using this algorithm, there always exists a “white path” between an object and its descendants. Because this algorithm is hard to parallelize, reachability-based algorithms are sometimes preferred to algorithms that rely on this one to find (\*) strongly-connected components. This algorithm successively turns vertices white, then gray, then black, and assigns every vertex a discovery and a finishing time. It has a runtime of big-O of V plus E and can be implemented either recursively or using a stack. For 10 points, name this search algorithm that goes all the way down a branch before backtracking, unlike breadth-first search.

ANSWER: depth-first search [or DFS, prompt on search]

<Eric Mukherjee, Other Science>

10. A late piece this composer may have written for the opening of a casino contains a four-note motif taken from a setting of the *Pange lingua* found in *Gradus ad Parnassum*. One of this composer's symphonies begins with eighth, quarter, quarter, quarter, eighth rhythm played successively on [read slowly] G, D, E-flat and low F-sharp. A symphony by this composer begins with split viola accompaniment before the violins introduce a (\*) short-short-long motif. The whole notes [read slowly] C, D, F, E start the last movement of one of this composer's symphonies which culminates in a five-voice fugato. This composer's only two minor-key symphonies are the “Little” and “Great” G minor. For 10 points, name this Classical composer of the “Jupiter” symphony.

ANSWER: Wolfgang Amadeus Mozart [or Johannes Chrysostomus Wolfgangus Theophilus Mozart]

<Gerhardt Hinkle, Classical Music>

11. A poetic commentary on this play is arranged as a series of dramatic monologues spoken by each character after the end of this play, is styled after the prose of Henry James, and was written by W. H. Auden. In an adaptation of this play, a character sings a song which repeats the lines “Now, hoe in hand / I work away all day.” That adaptation of this play ends with a character shouting the line “FREEDOM HI-DAY!” A character in an adaptation of this play is scolded for saying “Uhuru!” and instructs another character to “call me (\*) X.” The devil-god Eshu appears in a postcolonial adaptation of this play by Aime Cesaire. A character in this play was previously imprisoned in a tree by the witch Sycorax. For 10 points, name this Shakespeare play in which Caliban and Ariel are servants to Prospero.

ANSWER: *The Tempest* [or *A Tempest*; or *Une Tempête*] (The Auden commentary is titled *The Sea and the Mirror*.)

<Chandler West, World Literature>

12. *Description acceptable.* This position was dogmatized by Pope Leo X in the bull *Apostolici Regiminis*, which was influenced by a Marsilio Ficino work subtitled for this belief that analyzes an earlier thinker’s “Theology.” In one work, this belief is used to justify the “knowledge of abstract equality” from the imperfection of two stones. In *Meno*, Socrates asks a slave boy questions about geometry to demonstrate (\*) *anamnesis* derived this concept. Simmias and Cebes listen to “affinity” and “cyclical” arguments for this belief in a Platonic dialogue that ends with Socrates drinking hemlock. *Phaedo* consists of four arguments for, for 10 points, what belief claiming that a person’s *psyche* lives on after the death of their body?

ANSWER: immortality of the soul [accept answers saying that the soul exists before birth or after death; prompt on partial answers; prompt on “anamnesis” or “recollection” or “innate knowledge” or similar answers and ask what other concept are those attributed to; prompt on “metempsychosis” or “reincarnation” or similar answers]

<Jacob Augelli, Philosophy>

13. One of the two equations given by reformulating these statements in general relativity is just a restatement of the Bianchi identity. These statements can be written as a pair of equations giving the gradients of a certain tensor and its Hodge dual, with the latter equal to zero, in their “manifestly covariant” form. The fact that these statements are *not* preserved by Galilean transformations, but *are* (\*) Lorentz-invariant sparked the development of special relativity. Taking the curl of two of these statements and using the curl of curl identity allows these statements to be combined to give a pair of wave equations. These statements’ namesake added a displacement current to correct one of them named for Ampère. For 10 points, name these differential equations that form the basis of classical electromagnetism.

ANSWER: Maxwell’s equations [do NOT accept or prompt on “Maxwell relations”]

<Gerhardt Hinkle, Physics>

14. A leader of this organization was invited to China in 1971 to meet with Zhou Enlai [“JOE un-lye”] after being released from prison for the murder of John Frey. Shortly after detailing his infiltration of this organization for the documentary *Eyes on the Prize*, William O’Neal committed suicide. The Weather Underground declared war on the United States government after a leader of this organization was murdered by police in his Chicago apartment as part of (\*) COINTELPRO. The Mulford Act was passed to stop this organization from “copwatching.” This organization offered a Free Breakfast for Children Program and demanded the “power to determine the destiny of our Black Community” as part of its Ten-Point Program. For 10 points, name this leftist organization founded in Oakland by Bobby Seale and Huey Newton.

ANSWER: Black Panther Party for Self-Defense [or Black Panthers; or BPP] (The second sentence refers to O’Neal’s interview given for *Eyes on the Prize*.)

<Chandler West, American History>

15. Along with “first,” an *Atlantic* article named for this adjective discusses the embarrassment of a British man asking whether a maid’s employer was home. A book named for this adjective, which discusses a fiddling politician in the story *Arkansas Traveler*, describes *400 Years in Untold History* and was written by Nancy Isenberg. A (\*) backlash described with this adjective is often used to characterize the U.S. presidential elections in 1968 and 2016. A heavily criticized book named for this adjective describes how people described with this adjective will respond with anger and fear when presented with stress that threatens the status quo; that book by Robyn DiAngelo credits it to their fragility. For 10 points, name this adjective which, in critical race studies, describes a certain type of “privilege” and “supremacy.”

ANSWER: white [or White Trash; or White Fragility or “First White President”]  
<Erik Christensen, Social Science>

16. In one of these locations, a character recounts a Song of Solomon “to be sung to the cosmonauts” after three boys begin to play music on their recorders. In one of these locations, people exchange photographs that are described as “phantoms.” Many “microscripts” were made by Robert Walser while he was going on walks outside of one of these locations in Waldau. One of these locations is the setting of a play which features three murderous “physicists” and was written by Friedrich (\*) Durrenmatt. At one of these locations, a man seduces his Russian love interest on Walpurgis Night. After dreaming of a child being dismembered in the snow, a man leaves one of these places, where he was visiting his cousin Joachim. For 10 points, name these locations, one of which is visited by Hans Castorp in Thomas Mann’s *The Magic Mountain*.

ANSWER: sanatorium [or asylum; or mental institution; or madhouse (as that is the term used in *The Physicists*)]  
<Andrew Hanna, European Literature>

17. Jan Gehl [“yan gale”] credits this thinker with greatly influencing his work focusing on making decisions at the human scale. This thinker argued that economics is “disorganized complexity” with a large number of variables in contrast with the small number of variables in physics. A book by this thinker argues that a discipline influenced by Clarence Stein and Ebenezer Howard was fundamentally biased against the things it sought to improve. In that book, this thinker slams the (\*) “Towers in the Park” model pioneered by Le Corbusier. This thinker noted that keeping businesses open at night reduces crime by ensuring more “eyes on the street,” promoting safety on sidewalks. For 10 points, name this urbanist author behind the book *Death and Life of Great American Cities*.

ANSWER: Jane Jacobs  
<Erik Christensen, Other>

18. This quantity is allowed to fluctuate along individual branches in the BEAST algorithm, which is the “relaxed” form of another technique. This quantity is equal for all inputs in the Jukes–Cantor model. The Watterson estimator approximates the parameter theta, which equals four times N-sub-E times this quantity. The rate of fixation of a novel allele equals the neutral form of this quantity according to a theory proposed by Motoo Kimura. Dates of evolutionary divergence can be calculated using a (\*) “molecular clock” because this quantity remains constant over long time scales. Cancer cells increase this quantity by upregulating expression of error-prone polymerases. Intercalating agents and UV light can increase, for 10 points, what quantity, symbolized mu, which represents the frequency of changes to an organism's genome?

ANSWER: mutation rate [or mu before mentioned; or substitution rate; prompt on partial answer]  
<Sharath Narayan, Biology>

19. **Factories that made material for this activity were found in Carteia, one of a complex of Roman settlements in southern Spain highly valued for it along with Baeto Claudia. Many poor urban Romans would bring their own materials to do this activity at their local thermopolium. Materials for this activity were distributed to the public through the massive (\*) annona system.** An instruction manual for this activity in Vulgar Latin called the Apicius ["uh-PIC-ee-us"] frequently prescribes the use of a paste made by evaporating in the sun called garum. Wealthy Romans heavily partaking in this practice apocryphally would vomit on purpose to continue doing it. For 10 points, name this activity which was subsidized in the Roman Empire along with circuses, the main use of olive oil.

ANSWER: **eating** [or **cooking** or **baking**; or answers involving **banquets** or **meals**]

<Erik Christensen, Other History>

20. **A woman peels an orange and a toreador smokes a cigarette in two paintings this artist created in Seville. This artist curated Louisine Havemeyer's collection and depicted her in a white ball gown against a yellow background. Ludovic-Napoléon Lepic ["luh-peek"] gifted this artist a Brussels Griffon which was included in a turquoise-heavy painting of a young girl resting on an armchair. The Paris Salon accepted this artist's painting *The Mandolin Player* in 1868. Kitagawa (\*) Utamaro's boudoir ukiyo-e woodprints inspired this artist's paintings of nude women changing such as *The Toilette* and *The Coiffure*. This artist leans on an umbrella and views Louvre paintings in a print series by her friend Edgar Degas ["day-gah"], whom she helped popularize in the US.** For 10 points, name this Impressionist who often depicted mothers and children in paintings like *The Child's Bath*.

ANSWER: Mary **Cassatt** [or Mary **Stevenson** Cassatt] (The painting described in the third sentence is *Little Girl in a Blue Armchair*.)

<Ganon Evans, Painting/Sculpture>

1. The discovery of these particles in 1983 helped to verify Glashow-Weinberg-Salam theory. For 10 points each:  
[10m] *Two answers required.* Name these two particles in the Standard Model. Reactions involving neutrinos must be mediated by these two particles.

Answer: **W** AND **Z** boson [or **W**-plus or **W**-minus instead of **W**; or **Z0** or **Z**-nought instead of Z]

[10e] The W and Z bosons are carriers of this fundamental force, which governs beta decay. Despite its name, this force is significantly stronger than gravity.

Answer: **weak** nuclear force

[10h] The mass of the W boson is equal to the mass of the Z boson times the cosine of this value. The  $B^0$  ["B-zero"] boson is multiplied by the cosine of this value in the mathematical formulation of the photon.

Answer: weak **mixing angle** [or **Weinberg angle**]

<Beni Keown, Physics>

2. A Catholic girls' school set on this geographical feature titles a Scholastique Mukasonga novel. For 10 points each:

[10h] Name this geographical feature that titles a novel in which Anis Zani and his fellow drug addict friends are written about by the journalist Samara. In another novel set on this geographical feature, the unnamed narrator returns home and learns about the mysterious Mustafa Sa'eed.

ANSWER: **Nile** River [or **an-Nīl**; or *Our Lady of the Nile*; or *Adrift on the Nile*] (The novel in the second sentence is *Season of Migration to the North* by Tayeb Salih.)

[10e] *Adrift on the Nile* is a novel by this Egyptian Nobel laureate who also wrote the *Cairo Trilogy*.

ANSWER: Naguib **Mahfouz**

[10m] This character's trip aboard the *Karnak* is detailed in the novel *Death on the Nile*. This Belgian man dies in the novel *Curtain*.

ANSWER: **Hercule Poirot** [accept either underlined name] (Those novels are by Agatha Christie.)

<Chandler West, World Literature>

3. Around 400 BCE, techniques for producing this material spread from the Urewe culture in the African Great Lakes region across the continent. For 10 points each:

[10m] Name this material, whose production along with ceramics across Africa is associated with the Bantu expansion. This material was worked in a furnace called a bloomery.

ANSWER: **iron** [or **Fe**, prompt on **metal**]

[10e] This modern-day country was the furthest extent of the Bantu expansion, where different Bantu groups would become the Zulu and Xhosa.

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

[10h] The Bantus are thought to have originated in a plateau at the border between this country and its *western* neighbor, and split into two groups while migrating through it. The UNESCO site of Shum Luka is in this country.

ANSWER: **Cameroon**

<Erik Christensen, Other History>

4. In the opening scene of this film, commonly considered a prologue to seven episodes, the protagonist rides in a helicopter carrying a giant statue of Jesus. For 10 points each:

[10m] Name this film, which follows the life of a gossip reporter in a non-linear structure. In one of those episodes, the protagonist of this film visits the site of a spotting of the Virgin Mary which the Catholic Church refuses to recognize.

ANSWER: *La **Dolce Vita*** [or *The **Sweet Life***]

[10e] Like many films by Federico Fellini, *La Dolce Vita* is set in this Italian city, where the American Sylvia famously wades into the Trevi Fountain.

ANSWER: **Rome** [or **Roma**]

[10h] This Paolo Sorrentino film, set in Rome and influenced by *La Dolce Vita*, follows Jep, a 65-year-old fashion writer and socialite who visits the wreck of the Costa Concordia after meeting a very old nun at a dinner party.

ANSWER: *The **Great Beauty*** [or ***La grande bellezza***]

<Erik Christensen, Other Arts>

5. A Kate Wagner blog is dedicated to room-by-room takedowns of these sorts of buildings. For 10 points each:

[10m] Give the pejorative term for massive, shoddy suburban houses built en masse with no clear architectural plan. These buildings proliferated from the 80s onward as an alternative to more expensive custom upscale housing.

ANSWER: **McMansions** [or **Millenium Mansion**; prompt on mansions]

[10e] Much of the growing supply of McMansions became unsellable during this period, triggered by the housing bubble bursting and a subsequent crisis in subprime mortgages.

ANSWER: The **Great Recession** [or the **2007** or **2008 Recession**; or **2007** or **2008 Financial Crisis**]

[10h] Among the many distinctive features of McMansions are overly large and mismatched examples of these roofed, windowed structures that project vertically from a building's roof plane.

ANSWER: **dormers**

<Henry Atkins, Other>

6. The emotional demands placed on other people by people with this condition is referred to as "*this condition* supply." For 10 points each:

[10e] Name this mental disorder, which is characterized by an abnormal level of vanity and named for a mythological figure obsessed with his own reflection.

ANSWER: **narcissistic** personality disorder [or **NPD**; or **narcissism**]

[10h] Meier and Bushman have developed a surprisingly effective test of a single question for diagnosing NPD called SINS, which involves participants affirming or denying this short statement. You may give the exact statement or a close approximation.

ANSWER: **I am a narcissist** [or similar answers like "**I am narcissistic**"]

[10m] In the D-S-M-5, personality disorders are grouped under these categories. The narcissistic personality disorder is in the "B" group of this name along with antisocial, borderline, and histrionic personality disorder.

ANSWER: **cluster** [or **cluster B**]

<Erik Christensen, Social Science>



7. The hero Lugalbanda uses his super speed to travel to Uruk where Inanna advises him on how to capture this city. For 10 points each:

[10h] Name this legendary enemy city of Uruk. A Sumerian 'epic' is named for Enmerkar and a Lord of this city.

ANSWER: **Aratta** [or *Enmarkar and the Lord of Aratta*]

[10e] This later King of Uruk is Lugalbanda's son and Enmerkar's grandson. This man's companion Enkidu is killed after they slay the Bull of Heaven together.

ANSWER: **Gilgamesh** [or **Bilgamesh**]

[10m] Lugalbanda is given his speed after earning the favor of one of these animals called Anzû. A giant in the shape of one of these animals takes away the immortality of the Aesir by abducting Idunn and her golden apples.

ANSWER: **bird** [or **eagle**]

<Lia Rathburn, Mythology>

8. In 2012, women in this country performed a week long "sex-strike" against its leader Faure Gnassingbé ["for nyah-san-GBAY"], whose father Eyadéma was the longest ruling post-colonial leader in Africa. For 10 points each:

[10h] Name this country whose rich phosphate deposits were exploited as Germany's first African colony.

ANSWER: **Togo** [or the **Togolese Republic**; or **Togoland**]

[10m] Togolese President Sylvanus Olympio called this other leader a "black imperialist" over Togo's dependency on his Akosombo Dam on the Volta for electricity. This C-P-P leader was overthrown while visiting China.

ANSWER: Kwame **Nkrumah**

[10e] In 1963, Leon Poullada discovered Olympio's body on the doorstep to one of these locations. In 2018, the Trump administration moved one of these locations in Israel from Tel Aviv to Jerusalem.

ANSWER: U.S. **embassy** [or the American **embassy** or **diplomatic missions** or a **foreign mission** in place of embassy]

<Ganon Evans, World History>

9. While attempting to read a poem with this title at a conference at Madison Square Garden, Taslima Nasreen was booed off stage. For 10 points each:

[10h] Give this one-word title of a poem whose opening line states "I've given you all and now I'm nothing." A poem with this title contains the line "Go fuck yourself with your atom bomb."

ANSWER: "**America**" [do NOT accept or prompt on answers with extraneous words]

[10m] This author asked "America when will we end the human war?" in that poem. The third section of a long poem by this author repeats the refrain "I'm with you in Rockland."

ANSWER: Allen **Ginsberg** [or Irwin Allen **Ginsberg**] (The unnamed poem is *Howl*.)

[10e] This author described seeing "a Banner in gladsome air" in his poem "America." He also wrote about Captain Ahab's hunt for the title creature in *Moby Dick*.

ANSWER: Herman **Melville**

<Willie Chen, American Literature>

10. A class of enzymes named for this reaction that act on aromatic amino acids employ iron and tetra-hydro-bio-pterin as cofactors. For 10 points each:

[10h] Name this reaction which the aromatic side-chain of phenylalanine undergoes to form tyrosine.

ANSWER: **hydroxylation** [or anything involving adding a **hydroxyl** group]

[10m] A mutation in the P·A·H gene causes this autosomal recessive disorder, preventing the metabolism of phenylalanine. When untreated, it causes intellectual disability and a mouse-like odor.

ANSWER: **P·K·U** [or **phenylketonuria**]

[10e] Phenylalanine has this property, as does valine and alanine, which causes non-polar residues to aggregate in the core of proteins. Phospholipid tails orient towards each other because they have this property.

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

<Vishal Puppala, Biology>

11. The cosmological principle suggests that the spatial distribution of matter in the universe is homogeneous and has this property. For 10 points each:

[10m] Name this proposed property of the universe by which physical properties are uniform regardless of the direction of measurement.

ANSWER: **isotropy** [or **isotropic**]

[10h] The existence of this region of the C·M·B provides the strongest evidence against an isotropic universe. This region may be associated with a supervoid near the constellation Eridanus.

ANSWER: CMB **cold spot** [or WMAP **cold spot**]

[10e] The Sachs–Wolfe effect describes how C·M·B photons are redshifted due to this force. This force curves space according to general relativity, and classically its strength equals big G times two masses over distance squared.

ANSWER: **gravity** [or **gravitational** force]

<David Bass, Other science>

12. While at Harvard, John Warren paid Paul Revere’s son John to steal these items. For 10 points each:

[10m] Name these items that William Mayo secured as teaching tools from the Dakota War. After a Columbia student was caught stealing one of these items, the Doctor’s Riot erupted in 1788.

ANSWER: dead **bodies** [or obvious equivalents such as **corpses**; or **cadavers**]

[10e] In 1836, this man hosted a public autopsy of the purportedly 161 year-old enslaved woman Joice Heth, who was a member of his “freak show” alongside the dwarf “Tom Thumb.” The Ringling brothers bought out a circus this man founded with James Bailey.

ANSWER: P.T. **Barnum** [or Phineas Taylor **Barnum**; accept **Barnum** and Bailey Circus; or Ringling Brothers and **Barnum** and Bailey Circus]

[10h] Discussion of the cadaver trade is absent from this historian’s *The Half Has Never Been Told*, which analyzes the role slavery played in the Antebellum economy. He also wrote the influential *Creating an Old South*.

ANSWER: Ed **Baptist** [or Edward **Baptist**]

<Chandler West, American History>

13. Two colorful astronauts float near a projection of Apollo 13 in this artist's exhibition *Space Walk*. For 10 points each:

[10h] Name this Nigerian artist known for decapitating models from English painting and replacing their clothes with Dutch wax fabric in sculptures.

ANSWER: Yinka **Shonibare**

[10e] Shonibare used a Black model in his recreation of a Caravaggio painting on a wooden shield depicting this woman. In Shonibare's work, the snakes that make up this woman's hair are made of Ankara cloth.

ANSWER: **Medusa**

[10m] A 2015 Shonibare exhibition depicted the "Rage" of Ancient Greek Gods dressed as these people. A wax sculpture of one of these people with real hair and clothing is the only sculpture by an artist known for painting people with this profession.

ANSWER: **ballerina** [or a **ballet** dancer; prompt on **dancer** alone with "What type of dancer?"] (The sculpture in the second sentence is Edgar Degas' *Little Dancer of Fourteen Years*.)

<Ganon Evans, Painting/Sculpture>

14. Answer the following about references to British poetry made in Vladimir Nabokov's *Pale Fire*, for 10 points each:

[10h] King Charles' homeland of Zembla is a reference to this poem, which expounds an optimistic philosophy based on the Great Chain of Being. This poem notes that "whatever is, is right."

ANSWER: "An **Essay on Man**" (by Alexander Pope)

[10e] The poem "Pale Fire" refers to the Red Sox beating the Yankees 5-4 "On Chapman's Homer," a reference to this author. This author also wrote "Ode on a Grecian Urn."

ANSWER: John **Keats**

[10m] In Kinbote's notes, a boy points to a spot in Dulwich Forest where his "papa pisses," a reference to this author's "Pippa Passes." The speaker of one of this author's poems looks at a painting made by Fra Pandolf.

ANSWER: **Robert Browning** [prompt on **Browning**]

<Andrew Hanna, British Literature>

15. This question is introduced in a paragraph that describes someone who "made the beds, shopped for groceries... chauffeured Cub Scouts and Brownies" but silently cannot ask it. For 10 points each:

[10h] Give this silent question, coined in the introduction of a 1963 book about a "problem with no name" which the subject is too afraid to even ask.

ANSWER: "**Is this all?**"

[10e] The difficulty of confronting the question of "Is this all?" is addressed in *The Feminine Mystique*, a book written by this second wave feminist and co-founder of NOW.

ANSWER: Betty **Friedan**

[10m] The criticism of Freud in *The Feminine Mystique* was influenced by this book, rejecting the idea that there is no feminine libido. This book's second section, titled "Lived Experience," controversially defended abortion and lesbian relationships.

ANSWER: *The **Second Sex*** [or *Le **Deuxième Sexe***]

<Erik Christensen, Philosophy>

16. The first time this figure appears, a large pillar rises and moves towards the protagonist. For 10 points each:  
[10h] Name this figure, who tells the protagonist of the story in which he appears that he is a genius and can save mankind from suffering. This title figure of that story is a figment of the protagonist Korvin's imagination.

ANSWER: "The **Black Monk**" [or **Chyorny monakh**; prompt on a monk]

[10e] "The Black Monk" is a short story by this Russian author, who is often considered the master of the short story. This author's plays include *Uncle Vanya* and *The Cherry Orchard*.

ANSWER: Anton **Chekhov**

[10m] In Chekhov's story "The Lady with a Dog," Gurov reunites with Anna at an event of this type in her hometown. In *Madame Bovary*, Emma begins an affair with Léon after encountering him at one of these events.

ANSWER: **opera** performance [or **musical**]

<Chandler West, European Literature>

17. Answer the following questions about composers influenced by jazz, for 10 points each:

[10m] This composer traced the history of jazz with his *Swing Symphony*, which includes the movement "St. Louis to New Orleans." This founder of Jazz at Lincoln Center also won the Pulitzer Prize for a jazz oratorio about the slaves Jesse and Leona, *Blood on the Fields*.

ANSWER: Wynton **Marsalis**

[10e] This composer employed the Charleston rhythm and a blues progression in the first and second movements of his Piano Concerto in F. This composer also composed the jazz-influenced opera *Porgy and Bess*.

ANSWER: George **Gershwin**

[10h] This composer quoted Gershwin's "I Got Rhythm" and included a 12-bar blues theme in his *Afro-American Symphony*, which was the first symphony by an African-American to be performed for a United States audience.

ANSWER: William Grant **Still**

<Aidan Fein, Classical Music>

18. Answer the following about traditional healing in West African medicine. For 10 points each:

[10m] During the Liberian Civil War, priests would heal soldiers by communicating in a tree with the Bongoman Devil through one of these objects. The Emperor of Japan owns one of these objects which was hung from a tree to lure Amaterasu out of a cave.

ANSWER: **mirrors**

[10e] Demon bounty hunters in West Africa wear juju charms blessed by healers with this trait. In the African Great Lakes region, witch doctors have targeted people with this trait for usage of their body parts in rituals.

ANSWER: **albino** people [or answers indicating answers someone with **albinism**]

[10h] In Burkina Faso, soaking a metal arrow in water for 72 hours then using that water for a potion drunk out of the ground is said to grant this ability. A Jennifer Wenzel book titled for this trait studies millenarian Xhosa traditions such as Mhlakaza's cattle slaughter decree and Makhanda's promise of this trait for warriors.

ANSWER: being **bulletproof** [or any answers indicating that someone is **immune** or **invulnerable** to damage from **bullets** or **guns** or being **shot** or other obvious synonyms; prompt on being immune to damage or invulnerable or other equivalents with "To what, specifically, are they invulnerable?"]

<Ganon Evans, Religion>

19. This city spent the entirety of one conflict surrounded by soldiers representing the Republika Srpska [serp-ska], who killed civilians at the Markale marketplace massacres. For 10 points each:

[10m] Name this city, which was marked with sniper alleys and besieged for almost four years during a war in the 1990s.

ANSWER: **Sarajevo**

[10e] The Siege of Sarajevo took place during one of the several wars that occurred during the collapse of this country, which was led by Josef Tito for 37 years.

ANSWER: Socialist Federal Republic of **Yugoslavia**

[10h] After the Log Revolution, Serbs in Croatia declared this breakaway state during the Croatian War. This state's army fought alongside the Republika Srpska to unify with Serbia, but was defeated during Operation Storm.

ANSWER: Republic of Serbian **Krajina**

<Erik Christensen, European History>

20. The "rate-zonal" and "isopycnic" forms of this technique use density gradients to separate particles in a sample into bands. For 10 points each:

[10e] Name this lab technique that involves spinning samples at high speeds.

ANSWER: **centrifugation** [or ultracentrifugation; or rate-zonal centrifugation; or isopycnic centrifugation; or density gradient centrifugation]

[10m] *Description acceptable.* Unlike isopycnic centrifugation, rate-zonal centrifugation results can be ruined by this error because the density gradient is less dense than particles in the sample. This error causes DNA bands in gel electrophoresis to run off of the positive end of the gel.

ANSWER: **letting it run for too long** [accept answers indicating that an excessive amount of time is used; prompt on answers that indicate an excess of some quantity, like overshooting]

[10h] Rate-zonal centrifugation separates particles by this quantity, which is measured in svedbergs. Differential centrifugation can only separate particles if their values for this quantity differ greatly.

ANSWER: **sedimentation coefficient** [prompt on s]

<David Bass, Chemistry>