

HARI (Hari's Academic Regionals(-minus) Invitational): Lo, a Harimomentary rabbit stage

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ROUND 4

Tossups

1. **David Carter's compilation of documents related to this event includes accounts by journalist Dick Leitsch. Following this event, the "Annual Reminder" protests in Philadelphia began to be phased out. The editor of *The Ladder*, Barbara Gittings, was one of the organizers of this event. In 2016, the location of this event was made a national monument two weeks after the (*) Orlando nightclub shootings. The "Mayor of Christopher Street" was accused of throwing a brick at a car during this event. Leaflets passed out during this event called to "Get the Mafia and Cops out," because this event began in a Greenwich village bar owned by the Genovese family. For 10 points, name these 1969 protests which sparked the modern LGBT rights movement.**

ANSWER: Stonewall riots

<American History, Nageswaran>

2. **Mary Hervey's analysis of an object in this painting argues that it was based on a planetary clock created by Johannes Schöner. Hervey attempted to determine the identity of this painting's central figures, whose ages are inscribed on a golden dagger. The word "dividirt" appears in an open mathematics textbook in this painting below a globe pointing to Africa. A broken (*) lute string and a silver crucifix obscured by a green curtain are likely references to the Protestant Reformation in this painting. Visitors to London's National Gallery can properly see this painting's anamorphic skull when viewing it from the side. For 10 points, name this painting which depicts two Frenchmen in the court of Henry VIII, by Hans Holbein the Younger.**

ANSWER: *The Ambassadors* [or *The French Ambassadors*]

<Visual Fine Arts, Parameswaran>

3. **A monologue that describes scenes in this city like John Coltrane playing in a club is called *How I Learned What I Learned*. In a 2005 play set in this city, two agents at a Redevelopment Office fight over the demolition of a house at 1839 Wylie. In another play set in this city, Citizen Barlow travels to the metaphorical City of Bones with the help of the (*) 285 year old matriarch Aunt Ester. Those plays set in this city are *Gem of the Ocean* and *Radio Golf*. Rose takes in the motherless Raynell but kicks out her husband in a play set in this city, which ends with a funeral for the garbage truck driver Troy Maxson. For 10 points, what city is the setting of a cycle of plays by August Wilson that includes *Fences*?**

ANSWER: Pittsburgh

<Drama, Zhang>

4. **The "total-etch" type of this material is used in dentistry by using phosphoric acid to remove hydrophilic tooth surface material. Ninhydrin isn't one, but fingerprints on non-porous surfaces are fumed with this type of material in forensics. Low-molecular weight resins with a high glass transition temperature, called tackifiers, are usually added to these materials. (*) Cyanoacrylate is a fast-polymerizing one of these materials known for its strength. Geim and Novoselov first isolated graphene by using one of these materials to pull graphene flakes off from graphite. These materials are called pressure-sensitive if they bind to a surface upon application of pressure. For 10 points, name these materials used to attach items together.**

ANSWER: adhesives [accept specific adhesives like Scotch tape or superglue]

<Chemistry, Chen>

5. Roy Lichtenstein made 25 editions of a 1956 lithograph depicting one of these objects with an anteater-like portrait. BEP Form 5283 allows for the examination and possible redemption of these objects if they are mutilated. Seán Garland was arrested for distributing fake "super" versions of these objects that were produced by North Korea. Some of these items feature an interwoven 3D ribbon made by Crane Co. Timothy (*) Geithner and Jack Lew needed to make their signatures more legible before they could appear on these items. The Secret Service was originally founded to stop the spread of counterfeit versions of these objects, which have the same dimensions as the Philippine peso. For 10 points, coins and what objects make up U.S. currency?

ANSWER: U.S. banknotes [accept Federal Reserve Notes, U.S. paper money, dollar bills, or any equivalent that mention paper money of U.S. dollars; accept specific denominations like 100 dollar bill; accept greenbacks; prompt on money or currency or U.S. dollars; do not accept or prompt on "coins" or other currencies] (The Roy Lichtenstein work is *Ten Dollar Bill*.)

<Other, Zhang>

6. To explain the emergence of these entities, a philosopher proposed the "epistemic principle of border crossing." One of these entities will naturally arise due to human self-interest in the "invisible hand explanation," in which they develop from dominant protection agencies. These ability of these entities to enforce "patterned" distributions is critiqued in an argument in which one (*) million people voluntarily pay 25 cents to watch Wilt Chamberlain. The role of these entities is compared to a "night watchman" in a book that argues for a "minimal" one. These entities are discussed in the second section of a Robert Nozick book that defends libertarianism. For 10 points, name these political entities that are absent in anarchy.

ANSWER: states [accept governments; accept Anarchy, State, and Utopia; prompt on mutual protection agencies or dominant protection agencies]

<Philosophy, Chen>

7. A 2010 Mother Jones article by Carl Elliot titled for the "Deadly Corruption" of these events discusses Dan Markingson, who was forced by UMN to participate in one of these events that led to his suicide. In the U.S., the majority of these events are run by for-profit organizations called CROs. In collaboration with Open Orphan, the UK conducts the (*) "challenge" variety of these studies. These experiments are divided into phases 1 through 3, which aim to establish safety, efficacy, and a final confirmation. Moderna and Pfizer are some of the companies conducting these studies for the Covid-19 vaccine. For 10 points, pharmaceutical companies must conduct what type of study to get medication approved by the FDA?

ANSWER: clinical trials [or clinical studies; or drug trials; or vaccine trials; accept answers which refer to clinical trials specifically for Covid-19 vaccines; prompt on trials; prompt on answers referring to studies in biology or medicine or pharmacology]

<Current Events, Chen>

8. The anarchist *magonismo* movement was founded in this country by two brothers who ran the newspaper *Regeneration*. This country's secretary of public education proposed the idea of a united people known as the "cosmic race." Dwight Morrow served as ambassador to this country during the *Maximato* ("mahks-ee-mah-toh") period. Communal farms known as (*) ejidos ("ey-hee-doh") were introduced by a president of this country who also nationalized its oil industry in the 1930s. Jose Vasconcelos, a cultural icon of this country, served in the cabinet of Alvaro Obregon. Subcommandante Marcos has led a revolutionary movement from this country's Lacandon Jungle since the announcement of NAFTA. Emiliano Zapata fought in — for 10 points — what country's 1910s revolution?

ANSWER: Mexico

<World History, Liu>

9. One character in this novel dies while urinating on a tree after "knowingly [falling] into a trap of

nostalgia" brought on by a traveling circus. Another character in this novel is drowned and robbed in his own pool by four street children. That character had earlier turned away a relative who has been on the run ever since his 16 siblings were systematically assassinated due to their permanent (*) Ash Wednesday crosses. A character in this novel is shocked to discover that nobody believes a massacre of 3,000 protesting banana laborers actually took place. This novel opens with a flashback to the afternoon when Colonel Aureliano's father took him to "discover" ice. For 10 points, name this novel about seven generations of the Buendia family by Gabriel Garcia Marquez.

ANSWER: One Hundred Years of Solitude [or Cien años de soledad]

<Long Fiction, Schwartz>

10. In this organism, the *sd* locus induces sperm dysfunction in sperm that lack a specific allele of *sd*, resulting in non-Mendelian inheritance. The *Sex lethal* gene, which was discovered in this organism, controls its sex-determination by regulating the alternative splicing of *transformer*. In hybrid dysgenesis, crossing a male of this organism that possesses a (*) P element with a female that lacks a P element produces offspring with an increased mutation rate. Mutations in the *white* gene of this organism causes it to have white-colored eyes, which was one of the first X-linked traits to be discovered. Thomas Hunt Morgan studied this organism in a namesake "room" at Columbia University. For 10 points, name this common model organism, a small flying insect.

ANSWER: fruit fly [or Drosophila melanogaster; or D. melanogaster]

<Biology, Chen>

11. An erroneous history of this empire prompted the essay "How to Write Fake Global History," which responded to Alan Mikhail's *God's Shadow*. The encyclopedia *The Removal of Doubt* was created in this empire, which was home to a scholar who extensively documented the coast of the Americas, Piri Reis. The now-disputed Ghaza thesis states that this empire was founded by tribes fleeing the (*) Mongols. This empire's mythologized founder was a leader of the Oghuz tribe who settled his people in Bithynia. This empire dubbed its most powerful leader as "the lawgiver," while westerners referred to him as "the magnificent." For 10 points, Caroline Finkey documented what empire's history in *Osman's Dream*, which discusses the 1453 capture of Constantinople?

ANSWER: Ottoman Empire [prompt on Turkey]

<World History, Ah Now>

12. This figure is described as "a man already dead, a victim of the part that loved" in the title poem of an early Louise Glück collection titled for the "Triumph" of this figure. The weeping of two of this figure's animals upon witnessing the death of another figure is described in a poem by Constantine Cavafy. Scenes like "a weed-choked field" and (*) "an artificial wilderness / and a sky like lead" are found by an object owned by this figure, who "would not live long." W. H. Auden wrote a poem about the "shield" of this figure, which is the subject of the first use of *ekphrasis*. The first line of one epic poem implores a goddess to sing the "rage" of this figure. For 10 points, name this Greek warrior and friend of Patroclus in the Iliad.

ANSWER: Achilles [accept *Triumph of Achilles*, *Horses of Achilles*, or *Shield of Achilles*]

<Non-Epic Poetry, Zhang>

13. Reinhard Selten proposed a form of this concept robust to mistakes that he analogized to a "trembling hand." Whether senders agree on a signal or not differentiate "pooling," "separating," and "semi-separating" forms of this concept. The fact that situations often display multiple examples of this concept led Thomas Schelling to propose the concept of "focal points." McKenzie, Debreu, and Arrow derived the existence of a (*) "general" form of this concept in a system of markets. Evolutionarily stable strategies are examples of these concepts resistant to "invasion" by "mutant" behavior. Both players defecting is one of these concepts in the prisoner's dilemma. No player can increase payoff by unilaterally changing strategy in, for 10 points, the Nash form of what situation?

ANSWER: equilibrium [or equilibria; accept specific types of equilibrium like trembling hand perfect equilibrium or subgame perfect equilibrium or pooling equilibrium or separating equilibrium or semi-separating equilibrium or general equilibrium or Nash equilibrium]

<Social Science, Chen>

14. *Composer and type of piece required.* A siren plays before the entrance of the choir in the second of these works by this composer. In the finale of one of these works, a series of timpani strokes is followed by the brass playing the rising notes "pickup A D, E, F." The book *Testimony* claims that the scherzo of one of these works was intended to be a musical portrait of a recently deceased leader. One of these pieces repeatedly quotes a melody from Franz Lehár's *The Merry Widow* over an extremely long crescendo. The fifth of these works was labeled a (*) "creative response to justified criticism" after the composer was denounced by government officials. One of these pieces includes a repeated "invasion theme" over a snare drum ostinato. For 10 points, name these pieces by a Soviet composer, the seventh of which is nicknamed "Leningrad."

ANSWER: Dmitri Dmitriyevich Shostakovich's symphonies [prompt on partial answers]

<Auditory Fine Arts, Nageswaran>

15. This function is applied to data when "lambda equals 0" in the Box-Cox transformation. In the expectation step of EM algorithms, this function is applied to a different function that takes input "theta" before taking the expectation. Differences between outputs of this function on leading digits gives the distribution in Benford's law. This function partly names the distribution of the product of "i.i.d." random variables, which is related to the (*) normal distribution. This function, which is often applied to the likelihood, is the most used transformation of a right-skewed data set. This function transforms ratios to differences, which is useful since it also inverts exponentials. For 10 points, name this function whose "natural" form uses base e .

ANSWER: logarithm [accept natural logarithm or common logarithm; accept logarithm with any base]

<Math, Zhang>

16. A set of precursors to these figures were killed after failing to keep a torch and cigar burning through the night. One of these figures transforms a hair into a mosquito to avoid wooden effigies. These figures were reincarnated as catfish after being burned in an oven. The mother of these figures was impregnated when a skull in a calabash tree spit into her hand. To avenge the death of the Four Hundred Boys, these figures constructed a fake (*) crab to lure a demon named Zipacna. These figures defeat a bird who claims to be the sun with a blowgun, and they defeat One and Seven Death in the ball game. These figures became the sun and moon after slaying the Lords of Xibalba. For 10 points, the *Popol Vuh* follows what pair of mythological brothers?

ANSWER: Hero Twins [accept the names Hunaphu and Xbalanque in either order]

<Mythology, Zhang>

17. **Participants in one offensive during this conflict were compared to "sea of black and threatening waters" and aimed to reach 105 North Tower. Revenge in this conflict was inspired by a manuscript condemning a group of brothers "and their descendants, to the last of their race." "A life you love" inspired one man to save the life of another during this conflict. That man reflects that his death during this conflict "is a far, (*) far better rest that I go to than I have ever known."** Members of the Evrémonde family were targeted during this conflict, in part due to a manuscript written by Dr. Manette. Sydney Carton switches places with Charles Darnay to be executed during, for 10 points, which conflict that provides the setting for Charles Dickens's *A Tale of Two Cities*?

ANSWER: the **French Revolution** [prompt on answers relating to the conflict in *A Tale of Two Cities* by asking "Which historical conflict provides the setting for the book?"]

<Long Fiction, Nageswaran>

18. **The interlocking concrete construction method Knitlock was created for projects in this country. Harry Seidler was called the "great disruptor" of this country's architecture. A mosaic by Kumantje Jagamara lies within a round reflecting pool outside this country's Parliament, which consists of a square hill intersected by two hyperboloid arcs. While designing a building in this country, an architect devised a "spherical solution" that was allegedly inspired by (*) orange peels.** The plan for this country's capital drew on the original design by Marion and Walter Griffin. More than a million white tiles comprise the outer shells of a building in this country that was designed by Jørn Utzon. For 10 points, name this country home to the Sydney Opera House.

ANSWER: **Australia** [or Commonwealth of **Australia**]

<Other Fine Arts, Zhang>

19. **It's not reflectivity, but the ratio of the "specular" and "diffuse" forms of this quantity is used to explain Rician ("rice-ian") fading in the theory of TWDP. A ratio of this quantity is given by the Friis transmission equation, in which this quantity is proportional to a product of directivities. The ratio of this quantity of an antenna and that of an ideal isotropic antenna is its gain. For an isotropic antenna, this quantity per unit (*) area is independent of the azimuth and elevation angles. In radar, this quantity drops off with the fourth power of distance. Intensity is this quantity divided by area. For a resistor, the current times voltage is the amount of this quantity dissipated.** For 10 points, give this quantity which represents the amount of energy per unit time in watts.

ANSWER: **power** [prompt on p]

<Physics, Parameswaran>

20. **In this country, Karl Thopia invited a foreign power to help him win the Battle of Savra after driving out Charles and Joanna of Anjou. This country is home to a dwindling population of *burrnesha*, sworn virgins who became men to adhere to a 15th century *kanun*. The head of this country's Kastrioti family founded the League of (*) Lezhë, which was victorious at the 1450 siege of Krujë. This country was formed out of a Byzantine successor state in Epirus. The Kastrioti coat of arms, which depicts a two-headed eagle on a red background, was later adopted by this country. Alfonso V of Naples bankrolled a revolt in this country that was crushed by Mehmet II. Skanderbeg is a national hero in, for 10 points, what Balkan country with the capital Tirana?**

ANSWER: **Albania**

<European History, Parameswaran>

Bonuses

1. "Purely intellectual processes" like reason cannot demonstrate the veracity of these events since they cannot communicate their individuality. For 10 points each:

[10m] Name these events, which must be "ineffable, noetic, transient, and passive" according to one thinker who delivered a 1900-1902 series of Gifford Lectures titled for types of these events.

ANSWER: **religious experiences** [accept **mystical experiences**; accept *Varieties of **Religious Experience***]

[10e] This philosopher combined psychology and theology in his study *Varieties of Religious Experience*.

ANSWER: William **James**

[10h] This view holds that all religions grow from a single core truth that is manifest in the commonness of individual religious experiences. Walter Stace championed this view, which is contrasted with constructivism.

ANSWER: **perennialism**

<Philosophy, Zhang>

2. After a courthouse puts up a banner stating "READ YOUR BIBLE," a lawyer calls for another banner to be posted praising this book, to balance the original. For 10 points each:

[10h] Name this book. In a play, Henry Drummond stacks this book on top of the Bible and puts it in his bag after his rival Matthew Harrison Brady dies.

ANSWER: *On the **Origin of Species***

[10m] Drummond defends the teaching of evolution in this play by Jerome Lawrence and Robert E. Lee. It is a thinly veiled retelling of the Scopes Monkey Trial.

ANSWER: ***Inherit the Wind***

[10e] Much like *Inherit the Wind*, this play by Arthur Miller criticizes the spread of McCarthyism during the 1950s. John Proctor begs "leave me my name" before being hanged in this play about the Salem Witch Trials.

ANSWER: *The **Crucible***

<Drama, Schwartz>

3. As the chairwoman of this region, Khertek Anchimaa-Toka became the first non-royal female head of state. For 10 points each:

[10h] Name this region which formed an independent state until 1944. After the fall of the USSR, this region in Siberia joined the Russian Federation as a republic with its capital at Kyzyl.

ANSWER: Tannu **Tuva** [accept **Tuvan** People's Republic]

[10e] This leader orchestrated a 1929 coup in Tuva due to Donduk Kuular's association with Buddhist monks. This "man of steel" led the Soviet Union through World War II.

ANSWER: Joseph **Stalin** [accept Ioseb Besarionis dze **Jugashvili**]

[10m] Like Stalin, the Tannu Tuva government opposed this Lenin program, which involved mixing free market and capitalist ideas with communism. It would be replaced by the first Five Year Plan.

ANSWER: **New Economic Policy** [or **NEP**]

<European History, Nageswaran>

4. The name of the first movement of this composer's violin concerto, 1726, is a reference to the address of the Curtis Institute of Music. For 10 points each:

[10h] Name this composer of that violin concerto composed for Hilary Hahn. This composer was also commissioned by the Curtis Institute of Music to write *blue cathedral*.

ANSWER: Jennifer Elaine **Higdon**

[10e] Higdon's lone opera *Cold Mountain* is an adaptation of a novel set during this conflict. Julia Ward Howe wrote "The Battle Hymn of the Republic" during this conflict.

ANSWER: American **Civil War**

[10m] A piece by Jennifer Higdon in this genre was premiered by Yuja Wang along with the National Symphony Orchestra. Isata Kanneh-Mason recently recorded an A-minor piece in this genre by Clara Schumann.

ANSWER: **piano concerto**

<Auditory Fine Arts, Nageswaran>

5. Answer the following about how satellites perform attitude control, the maintaining of orientation. For 10 points each:

[10e] Satellites determine position using a horizon sensor, which detects the amount of this type of radiation given off by Earth. This type of radiation is detected by thermal imaging cameras.

ANSWER: **infrared** radiation [or **IR**; prompt on "**black-body** radiation" by asking "In what region of the electromagnetic spectrum?"]

[10m] Satellite rotation is sensed by the ring laser type of these devices that rely on the Sagnac effect. Other examples of these orientation-sensing devices consist of a wheel suspended by three gimbals.

ANSWER: **gyroscopes** [or ring laser **gyroscopes**; prompt on **interferometers**]

[10h] Satellites can stabilize using tidal forces to align an axis in a technique named after this quantity's gradient, which is a 3 by 3 tensor measured by "full tensor" devices. This quantity is measured in units of gals.

ANSWER: **gravity** [or (lowercase) **g**; or acceleration due to **gravity**; or **gravitational** acceleration; or Earth's **gravitational** field; prompt on **acceleration** with "acceleration induced by what force?"; prompt on **field** strength of "the field associated with what force?"]

<Physics, Chen>

6. The St. Onuphrius Monastery was built at the location where this figure died. For 10 points each:

[10e] Name this disciple who died at the *Akeldama*, or Field of Blood, either by hanging himself for betraying Jesus or by simply exploding.

ANSWER: **Judas** Iscariot

[10m] The minor prophet Zechariah threw this amount of money to a potter, which is read as a prediction of the Church's purchase of the *Akeldama* from potters. Judas received this amount of money for his betrayal of Jesus, and donated it to the Church to buy the land.

ANSWER: **30 silver** coins [or **30 pieces of silver** or other equivalents; prompt on partial answers like **30 coins**]

[10h] Matthew instead claimed that this other prophet predicted the purchase of the *Akeldama* when he bought a field at Anathoth during the Babylonian Captivity. This prophet speaks to God at a potter's house and is later thrown into a mud-filled cistern.

ANSWER: **Jeremiah**

<Religion, Zhang>

7. Excess amounts of this molecule in the bloodstream combined with low amounts of oxaloacetate can lead to the formation of ketone bodies. For 10 points each:

[10m] Name this molecule produced from the breakdown of long chain fatty acids in beta-oxidation.

ANSWER: **acetyl-CoA** [or **acetyl-coenzyme A**]

[10e] Acetyl-CoA reacts with oxaloacetate at the beginning of this metabolic cycle. This process follows glycolysis and precedes the electron transport chain in cellular respiration.

ANSWER: **Krebs** cycle [or the **citric acid** cycle; or the **tricarboxylic acid** cycle; or the **TCA** cycle]

[10h] Beta-oxidation can only begin once fatty acids have been transported into the mitochondria via a shuttle named for this molecule. This molecule binds to acetyl-CoA in a transesterification catalyzed by its namesake palmitoyltransferase.

ANSWER: **carnitine** [accept **carnitine** shuttle]

<Biology, Schwartz>

8. This composer departed from *opera seria* by de-emphasizing embellishment to achieve "noble simplicity." For 10 points each:

[10m] What German composer worked with librettist Ranieri de Calzabigi to "reform" opera in works such as *Alceste*?

ANSWER: Christoph Willibald **Gluck**

[10h] Gluck wrote two reform operas centered on this character in two places. Gluck's rival Niccolò Piccinni wrote a less successful version of the second of those two operas, where this woman serves the Scythian king Thoas.

ANSWER: **Iphigénie** [accept **Iphigenia**; accept **Iphigénie** en Aulide or **Iphigénie** en Tauride]

[10e] Gluck and Piccinni feuded while composing in this city. Modern-day opera performances in this city take place in the Palais Garnier or Opéra Bastille.

ANSWER: **Paris**

<Fine Arts, Zhang>

9. This country's emperor Menelik I is legendarily the son of the Queen of Sheba. For 10 points each:

[10e] Name this country, whose other emperors from the Solomonic Dynasty include Tewodros II and Yohannes IV. Its last emperor was Haile Selassie.

ANSWER: **Ethiopian** Kingdom [or **Abyssinia**]

[10m] Yohannes IV died in the Battle of Gallabat against followers of this figure, known as the Ansar. This Nubian figure, born Muhammad Ahmad, began a Sufi rebellion against the British.

ANSWER: the **Mahdi**

[10h] This city was the nominal capital of Ethiopia during the civil war that followed Tewodros II's assassination. This Ethiopian city was founded by Fasilides, who built a gigantic bath in it.

ANSWER: **Gondar**

<World History, Zhang>

10. An experimental poetry journal founded in this city took its title from Raymond Roussel's novel *Locus Solus*.
For 10 points each:

[10m] Name this city, which was home to a modernist "school" of poets including Ted Berrigan and Kenneth Koch. Their acquaintance wrote that "it is 12:20...on a Friday" in this city when he hears about Billie Holiday's death.

ANSWER: **New York** City (The poem is Frank O'Hara's "The Day Lady Died.")

[10e] Likely inspired by Dadaists, Berrigan cut up lines of other poems to create poems in this form. Berrigan's 1964 collection of poems in this form references Shakespeare's 154 poems in this form.

ANSWER: **sonnets**

[10h] This other New York School poet described how "the glass chose only to reflect what he saw" in a poem that titles a 1974 collection by him.

ANSWER: John **Ashbery** (The poem is *Self-portrait in a Convex Mirror*.)

<Non-Epic Poetry, Parameswaran>

11. Answer the following on different Greek myths regarding the alphabet, for 10 points each:

[10e] Aeschylus oddly claims that this Titan taught humans how to combine Greek letters, though he is probably better known for helping humanity by giving them fire.

ANSWER: **Prometheus**

[10h] This figure, a daughter of Inachus who is often syncretized with the Egyptian goddess Isis, was said by Isidore of Seville to have created the Egyptian alphabet while in Greece. The name of the Bosphorus strait references how this figure once crossed it.

ANSWER: **Io** (The Bosphorus's name roughly means cattle strait, referencing how Io was in the form of a cow)

[10m] Like Io, this figure was also lusted after by Zeus, who was in the form of a bull. This woman's brother Cadmus was said to have brought back the Phoenician alphabet to Greece during his travels to find this figure.

ANSWER: **Europa**

<Mythology, Hong>

12. In the CNDO method of this technique, only valence electrons are assumed to contribute to bonding and two-electron repulsion integrals are ignored. For 10 points each:

[10h] Name this general class of semi-empirical methods that approximate wavefunctions of molecular orbitals with Slater determinants.

ANSWER: **Hartree-Fock** method [accept **HF**; accept **self-consistent field** method or **SCF**]

[10m] The Hartree-Fock method relies on iteration to solve this equation, whose general time independent form states that the wavefunction is an eigenfunction of the Hamiltonian operator.

ANSWER: **Schrodinger** equation

[10e] Computational methods like Hartree-Fock are necessary since the Schrodinger equation can only be exactly solved for systems with this many electrons. A neutral hydrogen atom has this many electrons.

ANSWER: **one**

<Chemistry, Tong>

13. Activists in this state performed the play *You Made Me A Communist*. For 10 points each:

[10h] Name this Indian state, the only remaining stronghold of the Communist Party of India. In 1946, communists rebelled against this state's Travancore Kingdom.

ANSWER: **Kerala**

[10e] This first prime minister of India avowed socialism, as exemplified by his praise of Lenin in *Glimpses of World History*. He instituted India's first-ever Five Year Plan.

ANSWER: Jawaharlal **Nehru**

[10m] Kerala communists also participated in these nonviolent protests against the Travancore Kingdom's treatment of Dalits. Mahatma Gandhi coined the name of these protests, whose name in Sanskrit translates to "soul force."

ANSWER: **satyagraha**

<World History, Nageswaran>

14. This character worries that his name would be dishonored and his victories stained if a voyage were to succeed. For 10 points each:

[10h] Name this character, whose attempts to stop that voyage include tricking the explorers into believing the natives of one territory are Christian. Venus, however, repeatedly defends the voyagers from this character's plots.

ANSWER: **Bacchus**

[10m] Bacchus attempts to stop the journey of this "eloquent captain." During his voyage, this character battles the evil giant Adamastor and develops a relationship with the nymph Tethys.

ANSWER: Vasco **da Gama**

[10e] Vasco da Gama is the hero of *The Lusiads*, the national epic of this country.

ANSWER: **Portugal** [accept the **Portuguese** Republic]

<Long Fiction, Nageswaran>

15. A legend that poker cheaters would be thrown into these locations may have inspired the name of the last dealt card in Texas Hold 'em. For 10 points each:

[10e] Name these locations. State statutes that permit gambling only in these locations have led to permanent casino boats anchored in them.

ANSWER: **rivers** [prompt on bodies of water]

[10m] Due to their sovereignty, states cannot fully ban gambling in these locations, making them popular sites for casinos. Casinos in this type of location include WinStar and Foxwoods.

ANSWER: Native American **reservations**

[10h] A state law prohibiting owning more than one casino forced MGM to sell a casino in this city, one of the largest to legalize gambling, to Marian Ilitch. Another casino in this city is located in its Greektown Historic District.

ANSWER: **Detroit**, Michigan [The casinos are MGM Grand Detroit, MotorCity Casino Hotel, and Greektown Casino Hotel.]

<Geography, Zhang>

16. This action was performed in 1953 after its artist created several paneled white monochrome paintings. For 10 points each:

[10h] Name this action performed by Robert Rauschenberg for over two months on a sketch that was likely intended to be part of the *Woman* series.

ANSWER: **erasing** a sketch by Willem de Kooning [accept word forms; accept ***Erased** de Kooning*]

[10m] Robert Rauschenberg deemed the gilded frame of *Erased de Kooning* as inseparable from the drawing because of an inscription by this partner of his. This Pop artist was better known for incorporating encaustic wax techniques into depictions of American flags and targets.

ANSWER: Jasper **Johns**

[10e] Robert Rauschenberg and Willem de Kooning were both considered part of this American art movement, which also included Jackson Pollock.

ANSWER: **abstract expressionism** [prompt on partial answer; prompt on *ab ex*]

<Visual Fine Arts, Martin>

17. This character's valedictorian classmate "Shiny" becomes a professor at a HBCU, while he attends Atlanta University rather than an Ivy League after the death of his mother. For 10 points each:

[10h] Identify this unnamed narrator of a novel first published anonymously in 1912. This character first learns he is biracial after his principal asks "all of the white scholars" in his class to stand.

ANSWER: the **Ex-Colored Man**

[10m] This author of *The Autobiography of an Ex-Colored Man* also wrote the "Black National Anthem" *Lift Every Voice and Sing*.

ANSWER: James Weldon **Johnson**

[10e] After a white speaker disparages the intellectual potential of Black children, eighth grade graduates sing *Lift Every Voice and Sing* "out of habit" in this autobiography by Maya Angelou.

ANSWER: ***I Know Why the Caged Bird Sings***

<Short Fiction/Other, Zhang>

18. According to this school of economics, the purpose of taxes is to make people want money, reduce inflation, reduce inequality, and discourage bad behaviors. For 10 points each:

[10m] Name this theory which claims that since the United States controls its own supply of money, deficits aren't necessarily harmful.

ANSWER: **Modern Monetary Theory** [or **MMT**]

[10h] This economist detailed the rationale for MMT in her 2020 book *The Deficit Myth*. This economist also advised the Democrats on the Senate Budget Committee and Bernie Sanders's 2016 campaign.

ANSWER: Stephanie **Kelton**

[10e] One critique of MMT is that it simply restates the ideas of this economist, who supported using fiscal and monetary policy to deal with crises in *The General Theory of Employment, Interest and Money*.

ANSWER: John Maynard **Keynes**

<Social Science, Nageswaran>

19. Mary Lyon was inspired by the writings of Joseph Emerson to found one of these places that grew out of the Mount Holyoke Seminary. For 10 points each:

[10e] What kind of institutions include the "Seven Sisters," which were specifically founded to educate women?

ANSWER: women's **colleges** [or women's **universities**; prompt on women's **schools**]

[10h] A women's education activist with this surname was inspired by her nephew's education at Middlebury College to run an all-female school from her home. As president of the WCTU, a woman with this surname created the slogan "Do Everything."

ANSWER: **Willard** [accept Emma **Willard**; accept Frances **Willard**]

[10m] This other woman pioneered higher education by becoming the first female recipient of a medical degree in the U.S. After graduating from Geneva Medical College, this woman mentored Marie Zakrzewska (**"zahn-ruh-zoo-skah"**).

ANSWER: Elizabeth **Blackwell**

<American History, Ah Now>

20. This classification system predicts that chromium will form silicates when oxidized and sulfides when not. For 10 points each:

[10h] Name this geochemical classification scheme which groups elements as either lithophiles, chalcophiles, atmophiles, or siderophiles based on their preferred host phases.

ANSWER: **Goldschmidt** classification

[10e] Siderophiles are named for their ability to sink into the core due to their affinity for this element. Hematite and magnetite are the two primary ores of this element.

ANSWER: **iron** [or **Fe**]

[10m] Victor Goldschmidt first devised his classification by studying these bodies, which led him to overestimate the amount of sulfur in the Earth. Amino acids have been found in the carbonaceous chondrite variety of these objects.

ANSWER: **meteorites** [accept specific examples like "carbonaceous chondrite **meteorites**" and "stony **meteorites**"; accept **meteors** or **meteoroids**; prompt on **asteroids**]

<Other Science, Schwartz>