

HARI (Hari's Academic Regionals(-minus) Invitational): Harimomentum Sanctuary

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ROUND 6

Tossups

1. **Duncan Watts** titled a 2003 book after this multi-word concept based on his work with **Steven Strogatz**. This concept, which originated in a short story by **Frigyés Karinthy**, is called both "tremendously comforting" and "like Chinese water torture" by **Ouisa Kittredge** in a play. **Paul** pretends to be a son of **Sidney Poitier** in that play titled for this concept by **John Guare** ("gwair"). A measure of this concept named for **Hungarian mathematician Paul (*) Erdős** ("AIR-dush") is an academic analogue of one involving an actor who starred in *Footloose*. This concept, which was tested by forwarding letters to Boston in **Stanley Milgram's** small-world experiment, can be quantified by **Bacon numbers**. For 10 points, name this concept that everyone in the world is a certain number of connections away.

ANSWER: six degrees of separation [accept five degrees of separation or degrees of connectedness; accept six degrees; accept small world phenomenon before read; prompt on connectedness or distance or clustering; anti-prompt on Bacon number before read]

<Other, Zhang>

2. This author concluded that "a return to 'free' competition...means a tyranny probably worse" in highlighting a "great deal of truth" in **Hayek's** *The Road to Serfdom*. This author wrote "highly civilized human beings are flying overhead, trying to kill me" in his 1941 essay "The Lion and the Unicorn." This author essentially copied from **Yevgeny Zamyatin's** novel *We* for the quote "Freedom is the freedom to say that (*) two plus two equals four." This author used **Leon Trotsky** as the model for a character with a "small, goatee beard" who authored a treatise on "oligarchical collectivism." The Tehran Conference inspired this author to divide the world into **Eurasia**, **Eastasia**, and **Oceania** in one of his novels. For 10 points, name this author of 1984.

ANSWER: George Orwell [or Eric Arthur Blair]

<Long Fiction, Parameswaran>

3. In the **X.509** protocol, this concept is encoded by the **DN** value, which is also used in **LDAP**. Software made by **Okta** specializes in the "management" of this concept. This concept can be established with the help of timestamped tickets by the **Kerberos** protocol. "Providers" of this concept grant users access across multiple applications in (*) SSO schemes. This concept is encoded by the radiofrequency signal of a RF chip and the integrated circuit chip in a "smart card." "What you have" is one of three "factors" used to verify this concept in **MFA**, which can also incorporate biometric data. About 10% of Americans are victims of the "theft" of, for 10 points, what concept often verified using documents like a driver's license or passport?

ANSWER: digital identity [accept word forms like identification; accept ID; accept self-sovereign identity or identity management or identity theft; prompt on distinguished name; prompt on authentication before "MFA"; prompt on verification by asking "of what?"; prompt on descriptive answers that refer to who or what something is]

<Other Science, Chen>

4. The slow motif "C, B-flat, up to E-flat" begins the *adagio cantabile* second movement of one of this composer's pieces that is often compared to K. 457. A low C-minor chord played over two octaves begins that piece by this composer, whose first section is marked *grave*. This composer used an E-flat major third to represent the first syllable of (*) "Lebewohl" in one of his pieces. The repeated ostinato "G-sharp, C-sharp, E" begins the *adagio sostenuto* first movement of one of this composer's pieces. This composer of "Les Adieux" also wrote a sonata which Ludwig Rellstab likened to a boat floating in Lake Lucerne. For 10 points, name this composer of the "Pathetique" and "Moonlight" piano sonatas.

ANSWER: Ludwig van Beethoven

<Auditory Fine Arts, Parameswaran>

5. Alexei Orlov received the epithet "Chesmensky" while fomenting early support for this cause in the 1770s. Jakob Fallmeyerar denounced this cause as a "classical intoxication" and claimed that the race in question had been annihilated. The "Authority of the Twelve Apostles" led a secret society that supported this cause whose members included Tsar Alexander I. That society, which supported this cause, was the (*) Filiki Eteria. At Missolonghi, Lord Byron died while fighting for this cause. The 1827 Treaty of London, which achieved goals for this cause, was signed following the destruction of Ibrahim Pasha's fleet at Navarino. For 10 points, give this cause, which sought to grant sovereignty for a country with a capital at Athens.

ANSWER: Greek independence [accept equivalents]

<European History, Parameswaran>

6. The Stewart acid-base balance approach is used to explain why this substance unusually has a pH of about 5.5, which is why a rapid influx of it may cause acidemia. This substance is the most commonly used crystalloid expander, although the lactate-containing Ringer's solution is a common alternative to it. At 3% or 7% concentration, this substance acts as a mucolytic agent. This substance is most commonly used at a (*) 0.9% concentration that is called "normal" or "physiological" since it is isotonic to serum. In patients unable to take in fluid by mouth, this substance is administered using an IV line into the bloodstream. For 10 points, name this substance, a solution consisting of table salt dissolved in water.

ANSWER: saline [or sodium chloride solution; or NaCl, accept salt water or salt solution before "table salt" is read, prompt on water; prompt on IV fluids]

<Biology, Chen>

7. The role of this group in society is outlined by *streedharma*. The Markandeya Purana contains a section declaring the spiritual representation of this group to be the origin of existence. In the now outlawed Pottukattu ceremony, some of these people would become *devadasis*. These people's energy is embodied by the deity Shakti. Until 2018, these people were (*) barred from entering the Sabarimala Temple in Kerala. This general group of people tie strings around the wrists of another group in exchange for gifts and the promise of protection during the Raksha Bandhan ceremony. Under some conditions, these people were expected to self-immolate in the practice of *Sati*. For 10 points, name these people who are usually not allowed to enter Hindu temples while menstruating.

ANSWER: Hindu women [or females; or girls; accept mothers; accept wives; accept sisters] <Religion, Nageswaran>

8. **This character observes a view where the "grey sky and the grey earth mingled inseparably" while looking for a hospital from their window. A caretaker for this character states that "nobody could accuse us of doing anything wrong" to justify kicking them out of a house. While their furniture is being moved, this character causes their mother to faint when he grabs hold of a (*) painting of a woman dressed only in furs. This character dies shortly after alarming three bearded lodgers during their sister's impromptu violin recital due to a rotting apple that his father lodged in his back. For 10 points, name this character who "awakes from troubled dreams" to find himself turned into a bug in *The Metamorphosis*.**

ANSWER: Gregor Samsa [accept either underlined portion]

<Short Fiction/Other, Schwartz>

9. **This artist copied the figure of a lady with two horns from *The Garden of Earthly Delights* for his work *Belvedere*. The resort town of Atrani appears several times in this artist's works, including in his *Metamorphosis* series. This artist's obsession with a "regular division of the plane" — inspired by the Alhambra — can be seen in works which contrast black-and-white (*) tessellations of knights and birds. This artist used the "Penrose triangle" in a work depicting people climbing an unending staircase. This artist's lithograph of two hands drawing each other into existence is discussed in a Douglas Hofstadter book which he names along with Kurt Gödel and J.S. Bach. For 10 points, name this Dutch artist of many paradoxical drawings.**

ANSWER: M.C. Escher [or Maurits Cornelis Escher]

<Visual Fine Arts, Parameswaran>

10. **Antonin Scalia argued that a legislation of this kind violated the 10th Amendment in his opinion in *Printz v. U.S.* An attack ad telling Joe Manchin to "honor his commitment" was aired after Manchin worked with Pat Toomey to draft this type of policy. In 1991, then-congressman Bernie Sanders controversially announced he would vote against one type of this legislation as he was against a (*) "one-size fits all policy." The 1967 Mulford Act was this type of legislation meant to counter the Black Panthers. The Brady Bill was an example of this kind of policy that was passed in response to the attempted assassination of Ronald Reagan. For 10 points, name this broad policy initiative opposed by the NRA due to 2nd Amendment concerns.**

ANSWER: gun control [accept specific types of gun control such as assault weapons ban; anti-prompt on background checks by asking "What general policy are they?"]

<American History, Nageswaran>

11. **These things were first discussed by Empedocles, although he used the word "roots" instead of the name that later became common. Aristotle's *De Caelo* claims these things are limited to the sublunary sphere, because unlike the heavens it has generation and corruption. The regular polyhedra are known as Platonic solids because of Plato's association of them with these things in the *Timaeus*. (*) Thales proposed one of these things as the *arche*, or ultimate underlying substance, but Anaximander claimed it must be *apeiron* instead since none of these things can produce their opposite. Aristotle added *aether* to this collection of things, which previously had four members. For 10 points, name this classical collection of the substances air, water, fire, and earth.**

ANSWER: classical elements [or the four elements; accept air, water, fire, and earth in any order before mention]

<Philosophy, Berns>

12. **Francisco Barreto died while leading an expedition to capture this good at Manica. Al-Bakri wrote of how the Soninke dominated the trade in this good, especially in the town of Bure. The primary export of the city of Sofala was this good, which led Europeans to associate Great Zimbabwe with the Biblical land of Ophir. Kumbi Saleh's rich deposits of this good led to the rise of an empire conquered by the (*) Almoravids in the 1100s. Salt was traded for this good in sub-Saharan towns like Taghaza. An object of this material that mythically fell from the sky was adopted by Osei Tutu as his throne; that "stool" of this material symbolized the Ashanti Empire. For 10 points, what precious metal names a "coast" that is in present-day Ghana?**

ANSWER: gold

<World History, Parameswaran>

13. **This character's veil is compared to a "wall of stone and steel," inside of which is "resurrection and life," at the funeral of a man whose genitals she earlier compares to "de change uh life." Mrs. Turner attempts to matchmake this character with her brother while she is married to a man whom she meets while working at a store with Hezekiah. This character spends much of her youth beneath a (*) pear tree that symbolizes her sexuality. After this character's husband fires a half-empty pistol three times, this character is forced to shoot him since he has contracted rabies. This character moves to the Everglades with that husband after Jody Starks dies. For 10 points, name this character, the protagonist of *Their Eyes Were Watching God*.**

ANSWER: **Janie Crawford** [accept either name]

<Long Fiction, Martin>

14. **The U.S. Army developed "Ufer" types of these circuit elements using concrete-encased electrodes. A potential difference between two terminals on these elements can create their namesake "loops." The inputs to non-inverting logic gates are typically connected with resistors to these elements in a "pull-down" configuration. On circuit diagrams, these elements are typically symbolized by three (*) horizontal lines of decreasing length. In houses, a bare copper wire acts as this element, and it is also performed by the third terminal on AC outlets. In most applications, the Earth acts as this circuit element. Electricals contain live and neutral wires and one denoting, for 10 points, what element, which provides a reference voltage near zero?**

ANSWER: **ground** [accept **the Earth** before mentioned; accept equivalents such as **zero volts** before mentioned]

<Physics, Parameswaran>

15. **Description acceptable. Since 2016, a series of "files" related to this event has been compiled by Sari Horwitz and Scott Higham of the *Washington Post*. DATA 2000 allowed qualified professionals to obtain "X-waivers" to mitigate this event. Alex Gibney's 2021 documentary *The Crime of the Century* details contributions by AmerisourceBergen, Cardinal, and McKesson to this event. Chris Christie chaired a Trump-era commission to combat this event. The (*) Sackler family received immunity from lawsuits resulting from this event after a bankruptcy settlement. Waves of this event correspond to deaths resulting from OxyContin and fentanyl. For 10 points, what crisis in the U.S. stems from overprescription and illegal use of pain relief medication?**

ANSWER: **opioid epidemic** [accept answers that mention **opioids** and an ongoing **crisis**; prompt on **opioid** or **drug addiction**; prompt on **drug crisis**; do not accept or prompt on "War on Drugs"]

<Current Events, Zhang>

16. **This concept is only applicable in situations that satisfy the 50% bar rule or the 51% bar rule, depending on state. A controversial restriction on the application of this concept in cases involving rescue workers is called the Fireman's rule. The Hand's Formula criterion, which states probability of loss times gravity of loss is greater than burden, is used to establish this concept when applying the (*) "reasonable person" standard. The "contributory" or "comparative" forms of this concept are applied when a plaintiff also displays this concept. Establishing this concept requires demonstrating both duty of care and breach of that duty. A defendant's carelessness leads to harm in, for 10 points, what concept in tort law often applied in drunk driving cases?**

ANSWER: **negligence** [prompt on **carelessness** or **recklessness**; prompt on **duty** of care with "which is required to establish what concept?"; prompt on legal **fault** or **liability** with "which can be established by demonstrating what tort?"]

<Social Science, Chen>

17. A rule named for this mathematician states that the derivative of an integral is equal to that integral of the partial derivative of the original integrand. He's not Cauchy, but this man created a criterion for determining alternating series' convergence based on whether the absolute values of their terms decrease monotonically to 0. Another rule named for this man states that for the n th derivative of $f(x)$ times g , binomial coefficients multiply each product of derivatives of f and g whose orders sum to n . This man, who names that generalization of the product rule, introduced the d/dx ("d over d x") notation for differentiation, unlike the dots and fluxions of an earlier English scientist. For 10 points, name this mathematician who co-invented calculus with Isaac Newton.

ANSWER: Gottfried Wilhelm Leibniz [accept Leibniz integral rule or general Leibniz rule]

<Math, Zhang>

18. "Sidney Allen" was the pseudonym used by Sadakichi Hartmann while writing critiques in one of this photographer's journals. This photographer commented that he had "photographed god" with regards to a picture he took at Lake George. A "round straw hat; funnel leaning left" inspired a picture by this photographer of the *Equivalents* series. Edward Steichen designed the cover for this photographer's journal (*) *Camera Work*. Sculptures by Constantin Brâncuși (brahn-KOOSH) were among the *avant-garde* works exhibited at his 291 gallery. A woman holds a baby in front of a clothesline in this photographer's most famous work, which depicts crowded passengers on the *SS Kaiser Wilhelm II*. For 10 points, name this "godfather of modern photography," who took the photograph *The Steerage*.

ANSWER: Alfred Stieglitz

<Other Fine Arts, Parameswaran>

19. This poet wrote more than three hundred short poems in the collection *Stray Birds*. Another collection by this poet asks "Who are you, reader, reading my poems an hundred years hence?" and opens with a queen letting her last servant be the title *Gardener* of her "flower garden." This poet said "we are too poor to be late" and "Time is endless in thy hands, my lord" in a (*) 1910 collection that he translated into English himself. That poem was cited by the Nobel Prize Committee as part of this poet's ability to demonstrate how "all things temporal are swallowed up in the eternal" and is found in a collection that begins with the lines "Thou hast made me endless, such is thy pleasure." For 10 points, name this Bengali poet of *Gitanjali*.

ANSWER: Rabindranath Tagore

<Non-Epic Poetry, Zhang>

20. John Morgan published the biography of a figure who lived amongst these people for 30 years and became the subject of the phrase "you've got Buckley's chance." After being shipwrecked, the white woman of Gippsland was supposedly taken captive by these people, justifying a punitive expedition against them by Angus McMillan. George Augustus Robinson's peace missions failed to prevent the genocide of these people during the (*) Black War. These people allowed John Batman's party to set up camp at Indented Head; Batman later signed an 1835 treaty with these people, granting him land rights near Port Philip. Captain Cook encountered these people at Botany Bay. For 10 points, name these indigenous peoples of Australia.

ANSWER: Australian Aborigines [accept Indigenous Australians or Indigenous Tasmanians before "Australia" is mentioned; accept specific tribes such as Wathaurong, Wurundjeri, etc.]

<World History, Parameswaran>

Bonuses

1. Many interesting molecules have been discovered in outer space using spectroscopic techniques. For 10 points each:

[10e] Drossart *et al.* first discovered a cyclic cation containing three members of this lightest element on the periodic table in the atmosphere of Jupiter in 1989.

ANSWER: hydrogen

[10m] The first chiral molecule in outer space was discovered in 2016 and contained this functional group. This functional group is commonly synthesized in the lab via the reaction of an alkene with a peroxyacid.

ANSWER: epoxide

[10h] This general class of organic molecules is thought to be ubiquitous in the interstellar medium. Members of this class of molecules are classified using Clar's rule and examples include anthracene and coronene.

ANSWER: polycyclic aromatic hydrocarbons [accept PAHs; prompt on hydrocarbons]

<Chemistry, Tong>

2. Broadway's first traffic jam was due to a lecture given by this philosopher, for 10 points each:

[10h] Name this philosopher who distinguished "duration" from clock time as separate from mechanical causality because it is not attached to space in his doctoral thesis. This thinker was criticized for using the term *Élan vital* to explain evolution.

ANSWER: Henri Bergson

[10m] Henri Bergson paired time with this concept in the title of that doctoral thesis subtitled "An Essay on the Immediate Data of Consciousness." Compatibilists believe that this concept and determinism can coexist.

ANSWER: free will

[10e] Bergson famously debated against this physicist whose theory of relativity Bergson described as "a metaphysics grafted upon science," though "not science."

ANSWER: Albert Einstein

<Philosophy, Martin>

3. Choe Chung established one of Korea's earliest private schools dedicated to the study of this philosopher. For 10 points each:

[10e] The Joseon dynasty adopted a revival of what philosopher's ideas as the state philosophy? The sayings of this Chinese philosopher are collected in the *Analects*.

ANSWER: Confucius [accept Confucianism; accept neo-Confucianism]

[10m] Confucianism in Korea built upon earlier hierarchies such as the bone-rank system, which was used by this kingdom. This kingdom unified Korea in the 7th century after defeating its rivals Baekje and Goguryeo.

ANSWER: Unified Silla [or Later Silla]

[10h] Members of this Joseon noble, scholarly class were expected to be knowledgeable in the Confucian classics. To enter this class, one had to perform well on the *gwageo* civil service exam.

ANSWER: yangban

<World History, Parameswaran>

4. After switching her white maid outfit with her master, a maid convinces people that she is the lady of the house in a play written in this language. For 10 points each:

[10m] Name this language, the original language of Ariel Dorfman's *Death and the Maiden*. Two prisoners narrate movie plots in a novel written in this language which was later adapted into a play.

ANSWER: **Spanish** (The first play mentioned is Sergio Vodanovic's *El Delantal Blanco*.)

[10h] The first play by Sergio Vodanovic, who also wrote *El Delantal Blanco*, is titled for these animals. An Osvaldo Dragún play is titled for a man who becomes one of these animals when it is the only job available.

ANSWER: **dogs** [accept **perros**; accept *Deja que los perros ladren*; accept *Let the dogs bark*; accept *Historia del hombre que se convirtió en perro*; accept *The Story of the Man Who Turned into a Dog*]

[10e] Ariel Dorfman's *Death and the Maiden* was adapted from a play to a work in this medium by Roman Polanski. Peter Shaffer's play *Amadeus* was also adapted into this medium.

ANSWER: **films** [accept **movies**; accept **motion pictures**]

<Drama, Nageswaran>

5. It was believed that this metal could be used to repel fairies because it helped churches survive lightning strikes. For 10 points each

[10e] Name this metal. U-shaped objects made of this metal are hung on doors as a sign of good luck.

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

[10h] The myth behind lucky horseshoes is attributed to this English saint, who nailed a horseshoe to the Devil's foot to repel him. This saint, who established Benedictine practices at the Abbey of Glastonbury, also repelled the Devil by clamping him with a pair of red-hot tongs.

ANSWER: Saint **Dunstan**

[10m] In an Austrian myth, a knight had an iron statue of one of these animals installed on Saint Stephen's Cathedral because one helped the knight escape the devil. Basilisks can be killed by the sound of one of these animals.

ANSWER: **rooster** [or **cock**; prompt on **chicken**]

<Mythology, Parameswaran>

6. This musician plays the melody alongside trombonist Ryan Porter in his rendition of "Clair de Lune" as a slow dance. For 10 points each:

[10h] Name this saxophonist, who holds his instrument in front of the moon on the cover of his 2015 album *The Epic*. In 2018, this musician released the album *Heaven and Earth*.

ANSWER: Kamasi **Washington**

[10m] Supposedly the first piece that Washington played on the saxophone was Wayne Shorter's standard "Sleeping Dancer Sleep On." Shorter later founded this jazz fusion band, which recorded the Charlie Parker tribute song "Birdland."

ANSWER: **Weather Report**

[10e] Washington backed this singer on a dark track titled "u" and helped produce the jazz-inspired songs on this rapper's hip-hop album *To Pimp A Butterfly*.

ANSWER: Kendrick **Lamar** [or Kendrick Lamar **Duckworth**]

<Fine Arts, Parameswaran>

7. A French mania in which these people bit and meowed at each other has been suggested to be manifestations of their unhappiness. For 10 points each:

[10e] Name these women, who lived in convents and obeyed the rules of poverty, chastity, and obedience. These people are referred to by the title "sister."

ANSWER: **nuns**

[10m] The spirituality of nuns can be understood through the "Sisterbook of Toss," a manuscript produced in this city. Another theologian from this city debated Martin Luther during the Marburg Colloquy.

ANSWER: **Zurich**

[10h] This nun recorded the visions she had in three books starting with the *Liber Scivias*. Known as the "Sibyl of the Rhine," she also composed one of the oldest musical dramas, *Ordo Virtutum*.

ANSWER: **Hildegard** of Bingen [or Saint **Hildegard**]

<European History, Parameswaran>

8. The University of Science and Technology of China constructed a quantum computer with 66 of these entities, making it the fastest such computer. For 10 points each:

[10e] Name these units of information in quantum computing. They can be visualized using a Bloch sphere.

ANSWER: **qubits** [or **quantum bits**]

[10h] Right now, quantum computing is in the "noisy intermediate-scale" era, meaning quantum computers contain too many qubits to benefit from this type of code but not enough to become fault tolerant. Peter Shor names one of these codes, which also include the bit flip code.

ANSWER: quantum **error correction** codes [or **error-correcting** codes]

[10m] Quantum computers face the issue in which qubits gain this property with their surrounding environment, and undergo decoherence. This property is a statistical correlation between the quantum states of two particles.

ANSWER: quantum **entanglement** [or being **entangled**]

<Physics, Parameswaran>

9. Name these cities with leaning towers, for 10 points each:

[10e] The iconic leaning tower in this Italian city began to lean less than a decade into its over two hundred year long construction.

ANSWER: **Pisa**

[10h] Another leaning tower is a pavilion that sits atop this city's Tiger Hill. I. M. Pei designed a museum in this city near Shanghai that combines geometric patterns with this city's classical gardens like Lion Grove Garden and Humble Administrator's Garden.

ANSWER: **Suzhou** ("soo-joh")

[10m] Capital Gate, known as this city's "Leaning Tower," is the steepest leaning tower in the world at 18 degrees. Frank Gehry designed a Guggenheim Museum that is still under construction in this Middle Eastern city, which also houses a branch of the Louvre.

ANSWER: **Abu Dhabi** [accept Guggenheim **Abu Dhabi** or **Abu Dhabi** Louvre]

<Geography, Zhang>

10. This author criticized the British political climate in the 1930s in his satirical novel *The Revenge for Love*. For 10 points each:

[10h] Name this English author, who wrote about the relationship between Kreisler and the title artist in Paris in his 1918 novel *Tarr*. He edited the magazine *BLAST*, an icon of Vorticism.

ANSWER: Percy Wyndham **Lewis**

[10e] An essay by this author that describes a vortex as the "point of maximum energy" coined the name of Vorticism. "Rock Drill" and "Pisan" are two of the sections of his poetry collection *The Cantos*.

ANSWER: Ezra **Pound**

[10m] Lewis was likely the inspiration for Shawn, the foil of Shem, in this novel. Written by one of Lewis's "men of 1914," this novel follows the Earwicker family.

ANSWER: ***Finnegan's Wake***

<Long Fiction, Parameswaran>

11. In the first story in the *Masnavi*, a physician hired by one of these people cures a handmaiden by bringing her lover, a goldsmith. For 10 points each:

[10m] Name this type of person. The title of a poem by Ferdowsi, the national epic of Iran, is translated as the "Book of" these people.

ANSWER: **kings** [accept *Book of Kings*; accept "The **King** and the Handmaiden"; accept ***Shahnameh***]

[10e] *Masnavi* or *Spiritual Couplets* was written by the Sufi poet Rūmī, who wrote in this language also used in the *Rubaiyat*.

ANSWER: **Persian** [or **Farsi**]

[10h] Rumi dedicated a Divan upon the disappearance of his teacher and spiritual mentor Shams, a figure from this Iranian city. This non-Isfahan city was also home to Saib, a 17th-century master of the ghazal, one of whose poems provided the title *A Thousand Splendid Suns*.

ANSWER: **Tabriz** [accept Shams of **Tabriz** or Shams-i **Tabrizi**; accept Saib **Tabrizi**]

<Non-Epic Poetry, Zhang>

12. Kaggle runs competitions to incentivize development of programs in this field. For 10 points each:

[10m] Name this subfield of AI in which training data is input into a model, and the model creates predictions about the features of future inputs.

ANSWER: **machine learning** [or **ML**]

[10e] Tin Kam Ho created a machine learning algorithm that uses random decision forests, which aptly are made up of these data structures. These connected acyclic graphs contain a root and leaves.

ANSWER: decision **trees**

[10h] Machine learning algorithms often suffer from this phenomenon common in regression-based models, in which a model performs much better on training data than on unseen or "test" data.

ANSWER: **overfitting** [prompt on bias-variance tradeoff]

<Other Science, Schwartz>

13. The Percussive Arts Society divides drum rudiments into four classes: diddles, flams, drags, and these techniques. For 10 points each:

[10e] Name these techniques that produce a sustained sound on a percussion instrument and are denoted by a tremolo.

ANSWER: drumrolls

[10m] Advanced players of this instrument produce a roll using a technique called a "thumb roll." More commonly, players produce a roll by shaking this instrument.

ANSWER: tambourine

[10h] Rolls are not necessary on this pitched instrument because its steel bars resonate greatly. Notes on this instrument can be dampened by hand or by using a pedal like that of a piano's, unlike using mallets like on a vibraphone.

ANSWER: glockenspiel [accept orchestral bells; prompt on bells]

<Auditory Fine Arts, Zhang>

14. You are a Tamil Iyer performing *sandhyavandanam* ("SUN-dyah-VUN-duh-num"). For 10 points each:

[10m] Because you have received one of these objects known as a *yajnopavit* (yat-NYO-puh-VEETH), you can perform *sandhyavandanam*. The Zoroastrian *kushti* is another sacred variety of these objects.

ANSWER: string [accept thread; prompt on girdle by asking "What general type of object is the kushti?"]

[10e] Like other Iyers ("eye-yehrs"), you belong to this highest caste in Hinduism. Members of this caste were historically priests due to supposedly representing the mouth of Purusha.

ANSWER: Brahmins

[10h] At many points during *sandhyavandanam*, you perform libations, or *arghyam*, to this deity. In a popular yoga pose known as this deity's namaskar ("num-UH-scar"), the performer begins with their hands clasped, prostrates themselves on the floor, and returns to the original position.

ANSWER: Surya [accept Surya Namaskar] (The exercise is also called the Sun Salutation.)

<Religion, Nageswaran>

15. During a 1986 conflict, these vehicles were equipped with the MILAN anti-tank missile system. For 10 points each:

[10h] Name these vehicles, approximately 400 of which were used to defeat 5000 Soviet-backed troops at the Battle of Fada.

ANSWER: Toyota Land Cruisers [or Toyota HiLuxes; prompt on cars or pick-up trucks by asking "From what company?"]

[10e] This leader initiated the Toyota War after he invaded Chad. This Libyan dictator proposed the Third International Theory in his *Green Book*.

ANSWER: Muammar Gaddafi

[10m] Toyota HiLuxes are ubiquitous in this autonomous region of Somalia with capital at Garoowe. Inscriptions at Deir al-Bahri depict Hatshepsut leading an expedition to a land with the same name.

ANSWER: Puntland [accept Land of Punt]

<World History, Nageswaran>

16. Salvatore Bellini first observed bacteria characterized by the presence of these organelles when he noticed every organism in his sample pointed the same way. For 10 points each:

[10h] Name these organelles consisting of nanometer-scale crystals which allow certain bacteria to position themselves at the oxic-anoxic interface.

ANSWER: **magnetosomes** [accept answers referring to **magnetite** crystals; prompt on magnetotactic bacteria by asking "what's the name of the organelle?"]

[10e] In magnetotactic bacteria, magnetosomes are found primarily within this other organelle, which separates the cell wall from the cytoplasm of prokaryotic cells.

ANSWER: **cell membrane** [or **plasma membrane**]

[10m] Despite being a polyphyletic group, the vast majority of magnetotactic bacteria belong to this category, which contain about 40% periplasm by volume and comparatively little peptidoglycan in their cell walls.

ANSWER: **gram-negative** bacteria [do not accept or prompt on "gram-positive bacteria"]

<Biology, Schwartz>

17. The fact that this phrase remains understood and yet unspoken is compared to saying "we are breathing" because "breaths are coming and going all the time." For 10 points each:

[10h] Name this five-word phrase which haunts a house in which "expensive and wonderful toys" are bought for Paul and his sisters before Paul drives himself into a frenzy to become "lucky."

ANSWER: "**There must be more money**"

[10m] Paul dies after predicting that Malabar will win a race, while riding the title toy in search of "more money" at the end of this short story.

ANSWER: "The **Rocking-Horse Winner**"

[10e] This English author wrote "The Rocking-Horse Winner." He also wrote about a woman's affair with the gamekeeper Oliver Mellors in his novel *Lady Chatterley's Lover*.

ANSWER: D. H. **Lawrence** [or David Herbert **Lawrence**]

<Short Fiction/Other, Schwartz>

18. A representative with this last name beat Matthew Lyon with a cane after the latter spat in his face on the House floor. For 10 points each:

[10h] Give this last name shared by Roger and his father Matthew, both of whom served as governors of Connecticut around the turn of the 19th century.

ANSWER: **Griswold** [accept Roger or Matthew **Griswold**]

[10e] Alfred Whitney Griswold served as professor and later president of this Ivy League university in New Haven, Connecticut and founded its namesake Political Union.

ANSWER: **Yale** University

[10m] John Augustus Griswold financed the construction of this ironclad, which engaged the *CSS Merrimack* at the 1862 Battle of Hampton Roads. This ship was designed by Swedish engineer John Ericsson.

ANSWER: USS **Monitor**

<American History, Zhang>

19. A table for calculating time is inscribed on a plaque at the foot of this sculpture. For 10 points each:

[10h] Name this bronze sculpture, a functioning sundial which consists of two semicircular figures and a bowstring. The B. F. Ferguson Monument Fund commissioned this sculpture to celebrate space exploration.

ANSWER: **Man Enters the Cosmos**

[10m] *Man Enters the Cosmos* is a work by this English sculptor. He was inspired by Chacmool figures for his *Reclining Figures* series.

ANSWER: Henry **Moore**

[10e] *Man Enters the Cosmos* can be found in this city alongside Henry Moore's earlier work *Nuclear Energy*. Other famous sculptures in this city include Anish Kapoor's *Cloud Gate*, affectionately known as "the Bean."

ANSWER: **Chicago**, Illinois

<Visual Fine Arts, Martin>

20. The parrot Lorita traveled on this vessel during an expedition that was meant to confirm the hypothesis of "drift voyaging." For 10 points each:

[10m] Name this raft that was used by Thor Heyerdahl in an effort to prove that Polynesia was settled by accident by South Americans.

ANSWER: **Kon-Tiki**

[10e] Heyerdahl suggested that the "Long-Ears" people from South America fought for power with the "Short-Ears" Polynesian people on this island. In *Aku-Aku*, Heyerdahl claimed that the moai statues on this island were "walked."

ANSWER: **Easter Island** [or **Rapa Nui**]

[10h] This writer said he was inspired by Heyerdahl to examine the decline of Easter Island in his 2005 book *Collapse*. This writer concluded that deforestation and other environmental damage was the primary cause.

ANSWER: Jared Mason **Diamond**

<Social Science, Nageswaran>