

2022 Winter Closed

Co-Head Editors: Tim Morrison and Tejas Raje

Editors: Justine French, William Golden, Hasna Karim, Itamar Naveh-Benjamin, Hari Parameswaran, Jonathen Settle, Ethan Strombeck, Jon Suh, and Annabelle Yang

Writers: Jacob Egol, Ganon Evans, Natan Holtzman, Aseem Keyal, Rahul Keyal, Amogh Kulkarni, Steven Liu, Chauncey Lo, Douglas Meeker, and Kai Smith

Logistics: Aidan Leahy

Packet A

Tossups

1. **This monarch was given a chain mail parasol after surviving an assassination attempt by a hunchback who fired a gun loaded with tobacco. J. J. Mayall's portraits of this monarch exacerbated the *cartomania* craze. This monarch's romanticized accounts of life in the Scottish Highlands detail the construction of Balmoral Castle. This monarch's secretary Henry Ponsonby became very jealous of the attention received by (*) Abdul Karim, known as the "Munshi."** As a child, this monarch was told never to leave the presence of the Duchess of Kent as one of eight rules imposed while they both lived in Kensington Palace. Russian cannons were melted down to create the first military crosses named after this monarch. Unusually for the time, this monarch wore a white dress for her wedding to Prince Albert. For 10 points, name this English monarch who ruled for much of the 1800s.

ANSWER: Queen Victoria [or Alexandrina Victoria] (The first clue refers to John William Bean.)

<Parameswaran, European History>

2. **In a thought experiment, two causally isomorphic circuits are switched on and off to argue that this phenomenon must satisfy the principle of organizational invariance. Another thinker analyzed studies of blindsight to distinguish between "access" and "phenomenal" types of this phenomenon. The position that humans are incapable of ever understanding this phenomenon is called mysterianism. A "multiple-drafts" theory of this phenomenon is defended against the (*) "Cartesian Theater" in a book by Daniel Dennett, who proposed that this phenomenon arises out of physical interactions. Reductionist theories of this phenomenon are attacked for being unable to explain qualia in a David Chalmers essay about this phenomenon's "hard problem."** For 10 points, name this phenomenon in which a being is aware of its own existence.

ANSWER: consciousness [accept Consciousness Explained or the hard problem of consciousness or access consciousness or phenomenal consciousness; prompt on qualia until read] (The second sentence is about Ned Block.)

<French, Philosophy>

3. **This stuff titles a 2020 biography of a poet organized via five sources of "fountaining outpouring" that was written by Mark Doty. This stuff "shows there is really no death" according to a poem that calls it "no less than the journey-work of the stars." A poem says that this stuff is "among black folks as among white" while guessing that it is "a child, the produced babe" or "a uniform hieroglyphic." A poet who thought that this stuff symbolized democracy called it "the handkerchief of the (*) Lord." The speaker of a long poem "loafes" at his "ease observing" this stuff and asks the reader to "loafe with me." A child's question of "what is" this stuff prompts the reply, "the beautiful uncut hair of graves." An oft-revised collection titled for this stuff includes the homoerotic "Calamus" poems, as well as "I Sing the Body Electric." For 10 points, what plant's "leaves" title Walt Whitman's magnum opus?**

ANSWER: grass [or *Leaves of Grass*; prompt on leaf, leaves, sprouts, or spears] (The Mark Doty book is *What is the Grass: Walt Whitman In My Life*.)

<R. Keyal, Poetry>

4. A city with this name that lies south of Seven Mile Beach is home to the Uglad House, a building that Barack Obama called “the biggest tax scam on record.” A city with this name contains the headquarters of the Caribbean economic union CARICOM. This is the name of the largest city on an Asian island formerly known as Prince of Wales Island; that city with this name lies across from Butterworth and west of the Penang bridge. Historian Walter Rodney was assassinated, likely on the orders of Forbes Burnham, in a (*) South American capital with this name. An American neighborhood with this name is home to both Alexander Graham Bell’s Volta Laboratory and an institution whose students often cheer “Hoya Saxa.” For 10 points, a neighborhood in Washington, D.C., with an eponymous university has what name that possibly references the British monarch in 1751?

ANSWER: **Georgetown** [or **George Town**]

<Lo, Geography>

5. In a device in which this phenomenon only occurs in a narrow bandwidth, Gaussian or raised-cosine apodization (“app-oh-dih-ZAY-shun”) smooths the index modulation and suppresses side-lobes. This phenomenon does not occur at the center point of a Smith chart. In open circuits, the complex-valued coefficient describing this phenomenon equals one. Impedance mismatch in transmission lines is characterized by this phenomenon’s coefficient, denoted capital gamma. In Mach–Zehnder interferometers, the (*) second beam is created when this phenomenon occurs partially. Optical fibers rely on a type of this phenomenon that occurs above an angle equal to the arcsine of the ratio of indices of refraction. When this phenomenon is specular, its angle equals the angle of incidence. For 10 points, name this phenomenon in which a wave bounces off a surface.

ANSWER: **reflection** [accept total internal **reflection**] (The first clue refers to a fiber Bragg grating.)

<Parameswaran, Physics>

6. *Two answers required.* A plot by one of these two men to kill the other is foiled by the sighting of a sword’s shadow in the moonlight. That episode is the source of a proverbial namesake “compulsion” of one of these men. One of these two men smiles before interrogating a spy beheaded by the other. Due to the prediction that the bones of Pelops, Neoptolemus, and one additional object are needed for Troy to fall, these two heroes steal the (*) Palladium. After apprehending the spy Dolon, these two men steal horses and kill King Rhesus during a night raid. During their respective *aristeias*, one of these men injures Ares and Aphrodite on the same day, while the other kills the many suitors of Penelope. For 10 points, name these two heroes, one of whom shares his name with an owner of flesh-eating mares and the other of whom endured a dangerous voyage home to Ithaca.

ANSWER: **Odysseus** AND **Diomedes** of Argos [accept **Ulysses** in place of “Odysseus”; reject “Diomedes of Thrace” in place of “Diomedes”]

<Kulkarni, Mythology>

7. A book titled for these things posits a “world literary space” via the ideas of Pierre Bourdieu and examines a system satirized in Arno Schmidt’s *The Egghead Republic*. Bussy-Rabutin (“boo-SEE ra-boo-TAN”) helped popularize the hundreds of these things that his cousin Madame de Sévigné (“say-veen-YAY”) obsessively produced for her daughter. Voltaire included essays on the Quakers and the Anglicans in a collection titled for these things. Several of these things made by Cicero were rediscovered in 1345 by (*) Petrarch, who recounted his ascent of Mont Ventoux (“vawn-too”) in a collection titled for “familiar” ones. A periodical by Pierre Bayle lent its name to an Enlightenment-era “republic” of these things, which title a 1721 novel about the Persians Uzbek and Rica by Montesquieu (“MON-teh-SKEW”). For 10 points, name these things, which comprise epistolary novels?

ANSWER: letters [accept epistles until “epistolary” is read; accept Republic of Letters or *The World Republic of Letters*; accept Letters on the English or *Philosophical Letters*; accept Epistolae familiares or *Familiar Letters*; accept *Persian Letters* or Lettres persanes] (*The World Republic of Letters* is by Pascale Casanova.)

<R. Keyal, Misc. Literature>

8. Each sender performs this operation on its transmission and a spreading signal in CDMA for wireless communication. This operation is performed on the bit shifted off and the tap bit in linear feedback shift registers, which are used to compute cyclic redundancy checks. Marvin Minsky and Seymour Papert proved that this operation cannot be classified by a single-layer perceptron. This operation corresponds to addition in GF(2) (“G-F-2”). Performing this operation on the two input bits gives the sum bit of a (*) half-adder. Three invocations of this logical operation can swap two variables without any temporary variables in a namesake “trick.” C++ and many other languages represent this logical operation with a caret, while in Boolean algebra it is denoted with a circled plus sign. For 10 points, name this logical operation that is true only when its two inputs are different.

ANSWER: XOR (“X-or”) [or exclusive or; or exclusive disjunction; or EOR; or EXOR; accept mod 2 addition or addition modulo 2 until “addition” is read; reject “OR” or “NOR”]

<Parameswaran, Other Science>

9. 49 well-preserved examples of these places are found in the Mozu-Furuichi world heritage site. The discovery of horse-trappings in these places has been used to support Egami Namio’s theory that “horse-riders” influenced Asian history. A national treasure that depicts a warrior with two narrow slits for eyes is an example of “clay cylinders” that once adorned these places. Those sculptures, known as *haniwa*, adorned examples of these places shaped like (*) keyholes during the Kofun period. One of these places was armed with 260 bronze crossbows to prevent robberies. According to *The Records of the Grand Historian*, a mercury river ran through one of these places near Xi’an, and its architects were buried in it to ensure secrecy. For 10 points, the Terracotta Army can be found in what sort of place, which was built for an aging Qín Shǐ Huángdì (“chin shurr hwang-dee”)?

ANSWER: tombs [accept mausoleums, burial mounds, or graves; accept kofun until read]

<Parameswaran, Other History>

10. A 2021 exhibition at this museum used blue beads and an engraved collar to explore personal stories of slavery in its country's history. To restore a painting housed by this museum, three neural networks were trained on a copy of that painting made by Gerrit Lundens. One artist used postcards from this museum as inspiration for a series of three reinterpretations that emphasize a musician's ruffled collar and the movement of a dancing lesson around a cat. This museum's collection inspired some (*) interior scenes created by Joan Miró ("zhoo-AHN mee-ROH"). A foot warmer sits by a wall tile adorned with Cupid in another painting housed at this museum. A hyper-resolution image uploaded by this museum allows detailed viewing of a girl who holds a chicken in a painting from its collection that depicts a shooting company. For 10 points, Vermeer's *The Milkmaid* and Rembrandt's *Night Watch* are found at what art museum in Amsterdam?

ANSWER: **Rijksmuseum** ("rikes-museum")

<Yang, Painting and Sculpture>

11. The collapses of a department store in this city in 1995 and a bridge in 1994 sparked widespread protests against corruption and shoddy construction practices. After a failed assassination attempt, a man captured in this city shockingly declared on live television that he came to cut the throat of a president. In 2001, this city's mayor removed an elevated highway in order to restore a creek running below it; that mayor was elected President in 2007 but was sent to jail in 2018 on bribery charges. 31 commandos infiltrated this city during the (*) Blue House Raid. This city chiefly benefited from the rapid economic progress dubbed the "Miracle on the Han River." The 1970s saw a massive development boom in this city's Gangnam district. For 10 points, name this capital of South Korea.

ANSWER: **Seoul** (The first clue refers to the collapse of the Sampoong Department Store and the Seongsu Bridge. The failed assassin is Kim Shin-Jo. The creek is the Cheonggye Creek. The mayor is Lee Myung-Bak.)

<Suh, World History>

12. The electronic properties of these materials are related to whether they have a "mod 3 equals one" or "mod 3 equals two" structure. Raman spectra of these materials display a bond-stretching out-of-plane phonon mode located between 100 and 500 inverse centimeters. The optical transition energy of these materials is plotted versus radial breathing mode frequency on a Kataura plot. The first reported synthesis of these materials was Sumio Iijima's arc-discharge evaporation method. The second (*) chiral index is always zero for these materials with a zigzag configuration. When these materials have nested layers, they are called "multi-walled." These materials' length-to-diameter aspect ratio is larger than any other known material. For 10 points, name these rolled layers of graphene.

ANSWER: carbon **nanotubes** [or **CNTs** or single-walled carbon **nanotubes** or **SWCNTs** or multi-walled carbon **nanotubes** or **MWCNTs**; prompt on nanomaterials or nanoparticles; reject "graphene"] (RBM refers to radial breathing mode.)

<Settle, Chemistry>

13. Saint Jerome's mention of these people in his translation of Isaiah 53 verse 4 led to the common depiction of Jesus as a "quasi" one of them. At the end of Mark chapter 1, Jesus orders one of these people to "show yourself to the priest and offer the sacrifices that Moses commanded." These people name "windows" also known as hagioscopes or squints that they used in medieval churches. They're not Pharisees, but a woman anoints Jesus's head with perfume at a dinner hosted by one of these people from Bethany named (*) Simon. In Luke 17, only one out of a group of ten of these people returns to Jesus, who tells him "your faith has made you well." The "martyr of charity" Father Damien died while caring for some of these people on the Hawaiian island of Moloka'i. For 10 points, on multiple occasions, Jesus heals what sufferers of a contagious disease?

ANSWER: lepers [or the leprous; accept people with leprosy or people with Hansen's disease; accept *quasi leprosus* or *quasi leprosum*; prompt on the sick or diseased or similar answers]

<Morrison, Religion>

14. When asked how she can avoid going to Hell, a girl in this novel deliberates for a moment and answers, "I must keep in good health, and not die." A pious girl in this novel "looks as if she were thinking of something beyond her punishment" when she is forced to stand in the middle of a schoolroom for a minor infraction. The protagonist slips behind a curtain to read Bewick's *History of British Birds* at the start of this novel, which opens, "There was no (*) possibility of taking a walk that day." This novel's protagonist sees her uncle's ghost while locked in the "red room" at Gateshead. This novel skips ahead eight years after the death from tuberculosis of Helen Burns, the protagonist's lone friend at the Lowood School. For 10 points, the title character eventually becomes a governess at Thornfield Hall and marries Mr. Rochester in what Charlotte Brontë novel?

ANSWER: Jane Eyre

<Morrison, Long Fiction>

15. This adjective appears in the title of a 2011 Paul Dourish and Genevieve Bell book that analyzes the "mess and mythology" of "ubiquitous." Roberto Busa pioneered a discipline described by this adjective via a massive project on Aquinas called the *Index Thomisticus*. The subfield of anthropology described by this term includes research by Mizuko Ito and Tom Boellstorff, the latter of whom studied (*) "Second Life." Marc Prensky contrasted "immigrants" and "natives" described by this term, exemplified respectively by Generations X and Z. A field focused on quantitative analysis of texts is known as this kind of "humanities." The gap in modern technology access is called this type of "divide." For 10 points, a "Revolution" described by what adjective involved a move away from analog technology?

ANSWER: digital [accept *Divining a Digital Future*; accept digital anthropology or digital humanities or digital immigrant or digital native or digital divide or digital ethnography or Digital Revolution]

<Morrison, Social Science>

16. These instruments are featured in Einojuhani Rautavaara's ("AY-no-yoo-ha-nee ROW-ta-vah-ra's") *Incantations* and a one-movement concerto by Jennifer Higdon that are both dedicated to Colin Currie. Two works by Amadeo Roldán may predate the first piece written for an ensemble of these instruments, Edgard Varèse's ("va-REZZ's") *Ionisation*. These instruments are often performed while barefoot by the deaf Scottish musician (*) Evelyn Glennie. These instruments play the last variation before the fugue in *A Young Person's Guide to the Orchestra*. Orchestral performers of these instruments are often responsible for several "auxiliary" examples of these instruments, and these instruments are typically put at the back of the orchestra. For 10 points, name this often rhythmic section whose instruments include the cymbals and snare drum.

ANSWER: percussion section [accept specific percussion instruments like drum or cymbals until "section" is read; accept percussion ensemble; reject "piano"]

<Strombeck, Classical Music>

17. In the north of this state, the secret “Red Legs” guerrilla unit was organized by Thomas Ewing to engage in a scorched earth campaign that created this state’s “Burnt District.” A few days after the bombing of Fort Sumter, Nathaniel Lyon captured this state’s Camp Jackson and fought the Battle of Wilson’s Creek in it alongside German communist Franz Sigel. Joseph Weydemeyer erected a fort to defend this state’s largest city and encouraged the emancipation of its slaves by (*) John C. Fremont. The Centralia Massacre in this state was committed by “Bloody Bill” Anderson, who traveled to a state west of this one to fight alongside other “bushwhackers.” “Border ruffians” from this state stuffed ballot boxes during “Bleeding Kansas.” For 10 points, name this border state where Union and Confederate forces fought over St. Louis.

ANSWER: Missouri

<Raje, American History>

18. While in Geneva, Agnes drunkenly recalls the ice wagon that went down her street in this country as Peter Frazier walks her home from a costume party in a story collected in *Paris Stories*. Another story reminds the reader that it is set in this country to justify why six outcomes for John and Mary, labeled A through F, may end happily. Edith and Sabitha’s forged love letters inspire the housekeeper Johanna to move in with the ailing Ken in a story from this country that is grouped with its unique form of (*) “Southern Gothic” and charts their path from “hateship” to marriage. Janet copes with her troubled daughters and her dying father’s upcoming surgery by visiting a planetarium in “The Moons of Jupiter,” a story by an author from this country who won the 2013 Nobel Prize in Literature. For 10 points, name this home country of Alice Munro and Margaret Atwood.

ANSWER: Canada (The stories are “The Ice Wagon Going Down the Street” by Mavis Gallant, “Happy Endings,” and “Hateship, Friendship, Courtship, Loveship, Marriage.” The subgenre is Southern Ontario Gothic.)

<R. Keyal, Short Fiction>

19. This noun partly titles a book by Geoff Dyer that claims William Eggleston’s photos look like they were taken by a Martian who ended up in Memphis. An exhibition titled for this noun was divided into “X,” “Y,” and “Z” portfolios and had its premiere at D.C.’s Corcoran Gallery canceled. This noun appears in the English title of a book whose cover features Henri Matisse cutouts of vegetative forms, and which includes an image of boys playing near a bombed-out wall. This noun is modified by (*) “perfect” in the title of a 1989 retrospective on Robert Mapplethorpe. A concept named for this noun is illustrated by photos of a cyclist taken from atop a staircase and a man jumping into a puddle behind the Gare Saint-Lazare (“garr san la-ZARR”), and refers to the ideal time to capture a photo. For 10 points, Henri Cartier-Bresson sought to photograph the “decisive” form of what period of time?

ANSWER: moment [accept *The Ongoing Moment* or *The Perfect Moment* or *The Decisive Moment*]

<R. Keyal, Other Arts>

20. Under a microscope, this substance crystallizes in a characteristic fern-leaf pattern. Very rarely, this substance enters the bloodstream, triggers DIC, and causes an “anaphylactoid syndrome.” A non-specific test for detecting this substance relies on its ability to turn a strip of nitrazine paper blue. A deficiency of this substance causes Potter sequence. A measurement of this substance’s “vertical pocket” comprises part of the Manning’s score assigned during a (*) biophysical profile. Lung development can be assessed by evaluating this substance’s lecithin/sphingomyelin (“LESS-uh-thin sfing-go-MY-uh-lin”) ratio. Meconium may “stain” this substance, which can be sampled several weeks after the chorionic (“kor-ee-ON-ick”) villus. The sudden appearance of this substance before 37 weeks defines a preterm rupture of membranes. For 10 points, name this protective fluid that fills the “sac” containing a fetus.

ANSWER: amniotic fluid

<Naveh-Benjamin, Biology>

Bonuses

1. This opera's disastrous premiere at the Teatro Argentina included a performer getting a bloody nose and a stray cat wandering onto the stage and ended with the audience shouting the name of the composer's rival Giovanni Paisiello ("pie-zee-ELL-oh"). For 10 points each:

[M] Name this opera whose source material had already been adapted by Paisiello. A character in this opera imitates townspeople calling his name during the virtuosic aria "Largo al factotum."

ANSWER: *The **Barber of Seville*** [or *The **Barber of Seville***, or *The Useless Precaution*; or *Il **barbiere di Siviglia**, ossia L'inutile precauzione*]

[E] This composer of the *The Thieving Magpie* received a better response to the second performance of his opera *The Barber of Seville*.

ANSWER: Gioachino **Rossini**

[H] *Original language term required.* Paisiello's motivations for stirring up the audience at *The Barber of Seville*'s premiere included its use of a *basso* part described by this adjective. Jean-Jacques Rousseau defended a genre described by this adjective against lyric tragedy during an 18th-century pamphlet war.

ANSWER: **buffo** [or **buffa**; accept opera **buffa**; accept basso **buffo**]

<Holtzman, Classical Music>

2. A play by this author jumps between the musings of its elderly protagonist Henry Carr and his youthful experiences in Zürich among people like Vladimir Lenin and Tristan Tzara. For 10 points each:

[E] Name this playwright of *Travesties* who alternated between portraying events in 1809 and the present day in the play *Arcadia*.

ANSWER: Tom **Stoppard** [or Tomáš **Stráussler**]

[M] This play uses reverse chronology to depict events starting in 1977 and moving back to 1968. In this Harold Pinter play, Emma has an affair with Jerry, her husband Robert's oldest friend.

ANSWER: **Betrayal**

[H] The same scene is played out repeatedly a few seconds at a time in this playwright's *Blue Heart*. This author distorted time in a play in which 25 years pass between Victorian-era colonial Africa and 1979 London.

ANSWER: Caryl **Churchill** (The play is *Cloud 9*.)

<Kulkarni, Drama>

3. The enzymes METTL3 ("mettle-3") and METTL14 ("mettle-14") form the core of a complex that performs this modification on adenosine ("uh-DEN-oh-seen"). For 10 points each:

[M] Name this modification that is overabundant in CpG-rich regions when proteins in the DNMT family are overexpressed.

ANSWER: **methylation** [or adding/transferring a **methyl** group] (The complex is the RNA m⁶A methyltransferase complex.)

[H] Fat mass and obesity-associated protein, or FTO, and a dioxygenase dependent on iron and this molecule are the major "erasers" of N⁶-methyladenosine ("N-6-methyl-adenosine") epigenetic marks. In an anaplerotic reaction, this molecule undergoes transamination to form glutamate.

ANSWER: **alpha-ketoglutarate** [or **2-oxoglutarate**; accept **alpha-ketoglutaric acid** or **2-oxoglutaric acid**]

[E] YTH domain-containing proteins have tryptophan pockets with this property that discriminate between N⁶-methyladenosine and non-methylated RNA. Molecules with this property repel water.

ANSWER: **hydrophobicity**

<Settle, Chemistry>

4. This empire's ruler Garcia II allied with the Dutch East India Company to drive out their mutual enemy Portugal. For 10 points each:

[M] Name this African empire. Its ruler Afonso I converted to Catholicism in the 15th century due to Portuguese influence.

ANSWER: Kingdom of **Kongo**

[E] In 1641, the Dutch defeated the Portuguese to capture this city, which is today the capital of Angola.

ANSWER: **Luanda**

[H] The Dutch allied with this queen of Ndongo and Matamba to defeat the Portuguese at the Battle of Kombi. This woman, now a national hero of Angola, used guerrilla tactics to maintain independence from Portugal.

ANSWER: **Nzinga** [or **Njinga**]

<Raje, World History>

5. Matthew Edney's essay on the "Use and Abuse of Cartography" links the objectification of "other" in imperial cartographic projects to this form of media. For 10 points each:

[E] Name this medium. Edney's essay echoes Andrea Dworkin's argument that objectification of women in *Playboy* and other media of this kind causes violence against women.

ANSWER: **pornography** [reject "erotica"]

[H] This saffron-clad figure exemplifies equivalence between land and female bodies. One argument against Kashmiri independence holds that Kashmir leaving India would decapitate this goddess, thus mutilating the nation.

ANSWER: **Bharat Mata** [prompt on Mother India]

[M] In *Culture and Imperialism*, this critic posits that "none of us is outside or beyond geography" and argues that like maps, literature such as *Mansfield Park* also conditioned the mindset that foregrounded imperial projects.

ANSWER: Edward **Said** [or Edward Wadie **Said**]

<Karim, Social Science>

6. This magazine sent Willa Cather to research the life of Mary Baker Eddy. For 10 points each:

[M] Name this magazine that also published definitive biographies of Napoleon and Abraham Lincoln. This magazine sponsored Ida Tarbell to write a 1904 history that includes interviews with her father and with tycoon Henry H. Rogers.

ANSWER: **McClure's Magazine**

[E] While working for this man's newspaper, Nellie Bly wrote about the treatment of patients at an asylum on Blackwell's Island. This man lends his name to an annual prize in journalism awarded by Columbia University.

ANSWER: Joseph **Pulitzer** [accept **Pulitzer** Prize]

[H] This journalist for *Collier's* snuck onto a civilian hospital ship to cover the D-Day landing and went on to cover the Arab-Israeli War and Vietnam War. This third wife of Ernest Hemingway names an annual journalism prize.

ANSWER: Martha **Gellhorn**

<Parameswaran, American History>

7. The ESCRT (“escort”) complexes are composed of a set of “signature proteins” that were once thought to be unique to this domain. For 10 points each:

[E] Since the 2010s, which domain of nucleated organisms is increasingly thought to have emerged from Archaea? It joined Archaea and Bacteria in the three-domain model proposed by Otto Kandler and Carl Woese (“woes”).

ANSWER: **Eukaryota** (“yoo-care-YO-ta”) [or **Eukarya**; accept **eukaryotes**]

[H] In a proposed phylum named for this figure, Archaea encode multiple GTPases (“G-T-P-aces”) previously considered “eukaryotic signature proteins,” providing support for the archaeal host hypothesis of eukaryotes.

ANSWER: **Loki** [accept **Lokiarchaeota** or **Lokiarchaeum**]

[M] Metagenomic analysis of *Lokiarchaeota* (“Loki-ark-ay-oh-ta”) relies in part on the highly conserved 16S variant of this molecule, which Carl Woese sequenced and used to construct phylogenies of the three domains.

ANSWER: **rRNA** [or **ribosomal RNA**; accept 16S **rRNA**; prompt on **RNA**]

<Naveh-Benjamin, Biology>

8. For a landmark performance of this song at the 1984 Grammys, its artist played the keytar while surrounded by bizarre breakdancing mannequins. For 10 points each:

[H] Name this hit single off the album *Future Shock* that was responsible for reviving the career of Herbie Hancock in the ’80s. It brought a style of jazz-infused instrumental hip-hop to the mainstream.

ANSWER: “**Rockit**”

[E] “Rockit” may be best known for featuring an early performance by DJ Grandmaster DXT that helped popularize scratching, which involves moving one of these objects back and forth on a turntable.

ANSWER: vinyl **records** [or **vinyls**; or **discs**; prompt on **LPs** or **albums** or **singles**]

[M] Scratching, cutting, and mixing were all pioneered by this early hip-hop artist who recorded the socially-conscious track “The Message” with his group the Furious Five.

ANSWER: Grandmaster **Flash** [or Joseph **Saddler**; accept Grandmaster **Flash** and the Furious Five]

<R. Keyal, Other Arts>

9. In a novel, a scholar of this author named Venantius cites this author’s discussion of metaphors to argue that Adelmo’s illustrations of fantastical beasts could reveal the truth. For 10 points each:

[M] Name this author of a work whose lost second book is poisoned by Jorge de Burgos, who then eats it when William of Baskerville and Adso of Melk confront him in the *finis Africae*.

ANSWER: **Aristotle**

[E] Aristotle’s *Poetics* is referenced in many philosophical debates woven throughout this author’s novel *The Name of the Rose*.

ANSWER: Umberto **Eco**

[H] In another philosophical digression, William tells a confused Adso that the epoch of this practice is over, because the need for it became a need for death. Inspired by Fra Dolcino (“dol-CHEE-noh”), the cellarer (“SELL-uh-rer”) Salvatore frequently repeats a Latin command to perform this practice.

ANSWER: **penitence** [or **penance**; or **paenitentia**; accept **penitenziagite**]

<French, Long Fiction>

10. This action is done to a mixture containing rice and jaggery as women sing on the second, or Surya, day of a festival celebrated by Tamil people. For 10 points each:

[H] Name this action that provides the name for that holiday, Pongal. A Hindu housewarming ceremony involves performing this action to symbolize an abundance of wealth and prosperity.

ANSWER: **boiling** over **milk** [accept **boiling over milk** or any answer indicating that the milk **overflows**; prompt on **boiling** by asking “what is being boiled?”]

[E] Indian environmentalists have called for an end to the practice of destroying unused belongings in one of these events during Bhogi, the first day of Pongal. The seven-tongued Hindu god of this phenomenon is Agni.

ANSWER: **fires** [or equivalent]

[M] On Kaanum Pongal, Tamil people pray for the wellbeing of these family members. Threads or bracelets called *rakhi* are tied around the wrists of these family members during Raksha Bandhan.

ANSWER: **brothers** [or **bhai**; or **anna**; prompt on **siblings**]

<A. Keyal, Religion>

11. Many poems in Niyi Osundare’s collection *The Eye of the Earth*, such as “Harvest Call,” adapt the conventions of this genre to English poetry. For 10 points each:

[H] Give this genre whose forms include the Zulu *izibongo*, Tswana *maboko*, and Yoruba *oriki*. Named for an English verb, its poems often consist of a series of colorful epithets for a deity or ruler.

ANSWER: **praise** poetry [or **praise** songs]

[E] This Yoruba poet of “Telephone Conversation” wrote the *oriki* poem “Dawn,” one of his many works praising the orisha Ogun. A praise-singer appears in his play *Death and the King’s Horseman*.

ANSWER: Wole **Soyinka** (“SHO-yin-kuh”) [or Akinwande Oluwole Babatunde **Soyinka**]

[M] Christopher Okigbo drew on the *oriki* form to eulogize this poet in “Lament of the Masks.” The couplet “In the prison of his days / Teach the free man how to praise” ends W. H. Auden’s poem eulogizing this poet.

ANSWER: W. B. **Yeats** [or William Butler **Yeats**; accept “In Memory of W. B. **Yeats**”]

<R. Keyal, Poetry>

12. Answer the following about how Mamluk art influenced, and was influenced by, Europe, for 10 points each.

[E] Craftsmen on the Venetian island of Murano likely learned the Mamluk technique of applying colors all at once to decorate this material. This material was also used to create ornate windows for Gothic cathedrals.

ANSWER: **glass** [accept stained **glass**]

[H] Mamluk craftsmen decorated one of these objects named after St. Louis with gold and silver inlays depicting a procession of mace-, ax-, and bow-bearers. Masons in Tournai (“toor-NAY”) were known for making these religious objects out of black marble.

ANSWER: baptismal **fonts** [or **baptistère**; or **baptistery**; accept wash **basins**]

[M] On the *Baptistère de St. Louis*, this art form’s *naskh* (“nask”) style was used in silver below the basin’s rim. A tool known as a *qalam* is used to create works in this art form.

ANSWER: **calligraphy** [accept Islamic **calligraphy**; accept Arabic **calligraphy**; prompt on **writing** or **script**]

<Parameswaran, Painting and Sculpture>

13. The Nyaya school accepts four of these things, including analogy, which the Sankhya school rejects. For 10 points each:

[H] Name these things often translated as “knowledge-sources.” In classical Indian epistemology, this Sanskrit term denotes general methods such as inference or testimony that are able to provide knowledge.

ANSWER: ***pramanas***

[M] The Buddhist thinker Nagarjuna rejected all *pramanas* using one of these arguments, claiming that a *pramana* must have an endless chain of *pramanas* justifying it. Plato’s third man argument is one of these arguments since it uses a single Form to generate an endless chain of Forms.

ANSWER: **infinite regress** argument [prompt on **regress** argument]

[E] Like Nagarjuna, the Charvaka school rejected most *pramanas*, but they maintained that this one was a valid source of knowledge. Empiricists claim that all or most knowledge is derived from this source.

ANSWER: **perception** [or **experience**; or **sensation**; or **observation**; or **pratyaksha**; accept word forms or equivalents such as **sense** or **observing** the world]

<French, Philosophy>

14. In Benjamin Labatut’s *When We Cease to Understand the World*, a discussion of the staining caused by using Zyklon A as a delouser on trains transitions into a passage about this substance. For 10 points each:

[H] Name this substance. That chapter also describes how Johann Dippel’s failed attempts at soul transplantation ironically led Jacob Diesbach to create this substance when trying to make cochineal (“kotch-ih-NEEL”).

ANSWER: **Prussian blue** [reject “blue”]

[E] Labatut also notes this Japanese artist’s use of Prussian blue in his print *The Great Wave off Kanagawa*.

ANSWER: Katsushika **Hokusai** [or **Hokusai** Katsushika]

[M] Cassia St. Clair’s *The Secret Lives of Color* describes how this scientist’s son John used Prussian blue to make the first blueprints. This astronomer’s sister Caroline discovered eight comets using his large reflecting telescopes.

ANSWER: William **Herschel** [or Frederick William **Herschel**; or Friedrich Wilhelm **Herschel**]

<A. Keyal, Other Academic>

15. *Note to moderator: Read the answer to the second bonus part carefully.* This state’s energy is equal to “one-half h -bar omega” for the quantum harmonic oscillator. For 10 points each:

[E] Name this lowest-energy state of a quantum system. It is contrasted with excited states.

ANSWER: **ground** state [accept **zero-point** energy]

[H] The variational method minimizes the value of this expression across a series of trial wave functions to approximate the ground state. Likewise, saddle points of this expression are used to approximate stationary states.

ANSWER: **expectation** value of the **Hamiltonian** [accept the **bra** times the **Hamiltonian** times the **ket** in that order; accept **expected** value or **EV** in place of “expectation value”; accept **trace** of the **density matrix** and the **Hamiltonian** or **trace** of the **Hamiltonian** and the **density matrix**; prompt on **expectation** value or **expected value** or **EV** by asking “expectation value of what?”; prompt on the **energy functional**; reject “expectation value of the energy”]

[M] Basis functions whose radial part is given by one of these functions are preferred over Slater-type orbitals for efficient variational methods of computing molecular orbitals. The integral from negative to positive infinity of the simplest of these functions is the square root of pi.

ANSWER: **Gaussian** functions

<Liu, Physics>

16. An essay calls this place “*una herida abierta* (“OO-nah eh-REE-dah ahb-YAIR-tah”), where the Third World grates against the First and bleeds.” For 10 points each:

[H] Name this place that titles a collection whose essay “How to Tame a Wild Tongue” describes the language created and spoken in this place as “your linguistic nightmare” and “an orphan.”

ANSWER: the **border**lands [or *la frontera*; accept **frontiers**; accept the **US–Mexico border**] (The collection is *Borderlands/La Frontera* by Gloria Anzaldúa.)

[E] Like Gloria Anzaldúa (“an-sal-DOO-ah”), this other Chicana author invokes both the “Virgen de Guadalupe” (“VEER-hain day gwa-da-LOO-pay”) and “diosa Coatlicue” (“dee-OH-sah ko-aht-LEE-kway”) in a poem about a lover who brings out “the Mexican spitfire in me.” This author also wrote *The House on Mango Street*.

ANSWER: Sandra **Cisneros** (“sees-NAIR-ohs”)

[M] Anzaldúa argues that La Virgen de Guadalupe, La Malinche (“mah-LEEN-chay”), and this figure serve as the “mothers” of Chicana identity. Cisneros’s “Woman Hollering Creek” reimagines this figure “gurgling a long ribbon of laughter, like water.”

ANSWER: La **Llorona** (“yo-ROH-nah”) [prompt on the Crying Woman or Weeping Woman or equivalent translations]

<Karim, Misc. Literature>

17. When the design matrix X has full column rank, this matrix equals: X times [pause] the inverse of the quantity “ X -transpose X ” [pause] times X -transpose. For 10 points each:

[H] Name this matrix often written capital H. It gets its common name because it maps true values to fitted values in OLS regression.

ANSWER: **hat** matrix [or **projection** matrix]

[E] Because the hat matrix is this type of projection, the vector of fitted values has this relationship to the vector of residuals. Two vectors have this property if their dot product is zero.

ANSWER: **orthogonality** [accept **perpendicularity**]

[M] That orthogonal decomposition is essentially the basis for this method introduced by Ronald Fisher. This method partitions the total sum of squared errors into between-group and within-group terms and applies an F-test to their normalized ratio.

ANSWER: **ANOVA** [or **analysis of variance**]

<Morrison, Other Science>

18. Answer the following about the views of Amy Coney Barrett, for 10 points each.

[E] Barrett’s dissent in *Kanter v. Barr* hints at her disagreement with this legislation, which was weakened by the Supreme Court in 2013. This legislation, passed in 1965, prohibits racial discrimination such as literacy tests intended to disenfranchise African-Americans.

ANSWER: **Voting Rights** Act of 1965 (The case that weakened it was *Shelby v. Holder*.)

[M] During her confirmation, Barrett claimed that she had “no agenda” regarding *Roe v. Wade*, which put forth a “right to privacy” based on the substantive form of this concept.

ANSWER: **due process** [or **due process** of law]

[H] Barrett’s textualism has also called into question whether the Supreme Court will uphold a doctrine named for this corporation, which states that federal courts must defer to a federal agency’s interpretation of ambiguous laws.

ANSWER: **Chevron** Corporation [accept **Chevron** deference or **Chevron** doctrine]

<A. Keyal, Current Events>

19. A king with this name constructed a mausoleum surrounded by massive stone heads at Mount Nemrut. For 10 points each:

[H] Give this name of a Commagene king who had the epithet Theos. The Jewish priest Mattathias and his family opposed the Hellenization policies of a Seleucid king with this name.

ANSWER: **Antiochus** [accept **Antiochus** I Theos; accept **Antiochus** IV Epiphanes]

[E] The Commagene capital of Samosata was located on the banks of this river. This river and the Tigris River provided sustenance to Mesopotamian civilizations.

ANSWER: **Euphrates** River

[M] Orontes, the ancestor of Antiochus I Theos, was supposedly granted his territory after harassing this force at Cunaxa. A Greek soldier who fought as part of this mercenary force recorded their campaigns in his *Anabasis*.

ANSWER: the **Ten Thousand** [or *oi Myrioi*] (That soldier is Xenophon.)

<Parameswaran, Other History>

20. Riots in this city were ignited after its antisemitic newspaper *Bessarabetz* published accusations of blood libel. For 10 points each:

[H] Name this city in the Russian Empire where a 1903 pogrom inspired Hayim Bialik's ("HA-yim bee-AH-lik's") poem "In the City of Slaughter." Michael Davitt traveled to this city to chronicle those events for *The New York Journal*.

ANSWER: **Kishinev** [or **Chişinău**]

[M] The editor of *Bessarabetz*, Pavel Krushevan, was the first to publish this fabricated text. This text was the subject of the 1933 Berne Trial in Switzerland.

ANSWER: *The **Protocols of the Elders of Zion*** [or *The **Protocols of the Meetings of the Learned Elders of Zion***; prompt on *The **Protocols***]

[E] This Soviet premier forced Russian Jews to move to the Jewish Autonomous Oblast in response to pogroms perpetrated around the country. Many Jewish intellectuals were killed during this leader's Great Purge.

ANSWER: Joseph **Stalin** [or Ioseb Besarionis dze **Jughashvili**]

<Raje, European History>