

**Chicago Open 2020 2021:** “We probably needed the extra year to finish it anyways.”

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**Packet by The Editors (1)**

## TOSSUPS

1. Nitroxides are introduced by modifying this amino acid in site-directed spin labeling, which is followed by E·P·R spectroscopy to study protein structural changes. The bi-arsenical reagents FAsH and ReAsH bind to motifs containing four of this amino acid. Common ways of attaching dyes and probes to this amino acid include Michael addition with maleimide (“MAL-uh-mide”) and alkylation with alkyl halides. In the first step of native chemical ligation, this amino acid attacks a C-terminal thioester. Bio-conjugations commonly target lysine and this amino acid. (\*) Ellman’s reagent is used to determine the amount of surface accessible residues of this amino acid. Caspases degrade substrates containing aspartate with an active site containing this amino acid. This rare amino acid is the most nucleophilic residue on natural proteins. This amino acid gives glutathione its antioxidant properties. For 10 points, the oxidation of the sulfhydryl groups of what amino acid forms disulfide bonds?

ANSWER: cysteine [or Cys; or C]

<Chemistry, Jonathen Settle>

2. A character gets over his feelings about this conflict to attend a FIFA World Cup match in New York City in the monoplay *A Night in November*. A wheelchair-bound aunt with dementia spends most of her stage time in a trance in a 2017 play set during this conflict, which opens with the finding of the Timex watch and “pickled” body of a man who had disappeared ten years prior. Another play set during this conflict ends with two men feeding a bowl of Frosties cereal to a lost (\*) animal which was found gallivanting around the house where Christy was tortured. A fighter in this conflict named Quinn Carney returns home in Jez Butterworth’s play *The Ferryman*. In another play, a commander in this conflict pulls out the toenails of a drug-pusher who is suspended from the ceiling, before learning of the poor health of his pet cat Wee Thomas. For 10 points, what conflict provides the setting of Martin McDonagh’s play *The Lieutenant of Inishmore*?

ANSWER: The Troubles [prompt on answers referring to Northern Ireland; reject “Irish Civil War”]

<Drama, Will Alston>

3. The fieldwork of archaeologist Ann Kendall established that these structures were built intensively as long as 4,000 years ago during the “pre-ceramic period.” In the environs of waystations, imperial servants called *yanakuna* were mostly responsible for working on these structures. The largest network of these structures still in use today was built by the Kollawa, Cabana, and other peoples in a deep valley which is named for its abundance of storehouses. A unique concentric set of these structures is found in the ruins of (\*) Moray.

Moving between these structures was facilitated by steps on the outside of the slightly inclined walls that surround them, as described by Garcilaso de la Vega. These structures, still widely used in the Colca Canyon, create microclimates which allow for the cultivation of more than 3,500 varieties of potato in Peru. For 10 points, what structures provide plots of flat land for farming in the Andes?

ANSWER: terraces [or andén or anden; prompt on farms]

<World History, Will Alston>

4. This artist explained a move away from Surrealism by stating “a time came when none of us could use the figure without mutilating it.” Early paintings which articulate this artist’s goal to use “myths of antiquity” to “express basic psychological ideas” include *Agamemnon and the Eagle*. This artist explained how art articulates the “plastic speech” of the world in *The Artist’s Reality*. In a response to Edward Alden Jewell of the *New York Times* which this artist co-wrote with (\*) Adolph Gottlieb, he said “it does not matter what one paints as long as it is well painted.” This artist’s painting *No. 9* exemplifies his transition from painting “multiforms” to “sectionals.” He taped the edges of canvases to accentuate his “black on gray” paintings, which are held in a building near Barnett Newman’s *Broken Obelisk*. The Menil Collection in Houston has a “chapel” of works made by, for 10 points, what artist of the *Four Seasons* murals?

ANSWER: Mark Rothko [or Markus Yakovlevich Rotkovich; accept Rothko Chapel]  
<Painting/Sculpture, Will Alston>

5. Keith DeRose likened this framework to “voodoo” since it produces some very strange results. A book about this framework draws on John Pollock’s functional generalizations to propose a set of criteria whose usefulness is illustrated with the example of Alpha Centauri super-scientists changing our bodies. In volumes such as *Justice*, the philosopher Nicholas Wolterstorff identified Thomas Reid as a forerunner to this framework, which is said to rely on an innate human disposition called *sensus* (\*) *divinitatis*. A “trilogy” of books about this framework includes a volume refuting the “Great Pumpkin” objection to it by comparing the ability to discern meaningful sentences to forming reasonable starting points. Under this framework, certain kinds of “warrant” are akin to accepting the existence of other minds. William Alston and Alvin Plantinga have written books advocating, for 10 points, what philosophical framework that uses theories of knowledge to defend religious belief?

ANSWER: reformed epistemology [accept warranted Christian belief before “warrant”; prompt on apologetics; reject “epistemology”]  
<Philosophy, Ike Jose>

6. This non-U.S. government organization was the main source of recruits for an operation led by lieutenant Anthony Hasloe to infiltrate an Axis naval headquarters. The Herlands Commission investigated several partnerships with this organization initiated by Charles Haffenden. To help search for U-Boats, this organization refitted much of the mackerel fleet that served Fulton Fish Market. This organization sabotaged a captured French ocean liner which was being re-outfitted to transport U.S. troops, the (\*) *SS Normandie*. During World War II, the U.S. government enlisted this organization’s help to put down dock worker strikes by working with Albert Anastasia. It supplied maps of local towns and ports in the leadup to Operation Husky, which targeted the homeland of many of its members. Operation Underworld was a secret government collaboration with, for 10 points, what organization whose leaders included Lucky Luciano?

ANSWER: The Mafia [or The Mob; accept Italian Mafia, or Five Families, or Genovese family, or Sicilian Mafia, or Cosa Nostra as they basically were all working together on all these things; accept Murder, Inc]  
<American History, Will Alston>

7. An essay by this author defends a woman “prosecuted the Fifth Time, for having a Bastard Child” whose deadbeat dads were never indicted. In a self-mocking essay, this author asks “What have I done to merit these cruel sufferings?” to which a disease responds “you have...indulged those legs of yours in your indolence.” A character created by this author laments that Harvard is full of “Dunces and Blockheads” after asking “Clericus” where to send her children to school. A letter by this author of “The Speech of Miss Polly Baker” and a dialogue with his own gout criticizes inconvenient (\*) “hoop-petticoats” as an example of the “pride of apparel.” He received several proposals in the mail from bachelors after sending fourteen letters to the *New-England Courant* under the name of a middle-aged widow. The character Father Abraham explains “The Way to Wealth” in one of his annual publications. For 10 points, name this creator of Silence Dogood and *Poor Richard’s Almanack*.

ANSWER: Benjamin Franklin [prompt on Silence Dogood before “Silence”]

<Misc. Lit, Will Alston>

8. Producing frequencies in this range is done through nonlinear reactive multiplication of signals from TUNNETT or IMPATT diodes. A laser is focused on an undoped semiconductor between two metal contacts to create radiation in this frequency range in photoconductive antennas, also called Auston switches. By obtaining both phase and amplitude information, direct measurement of the complex refractive index is achieved in a time-domain spectroscopy technique that exposes samples to waves in this frequency range. Sources like backward-wave oscillators have bridged this frequency range’s gap. The balloon-borne telescope BLAST images in this frequency range, which is used to study star formation in (\*) molecular clouds.

Wavelengths from one millimeter to 100 micrometers make up this frequency range. Medical T-ray imaging is an application of, for 10 points, what frequency range on the order of ten-to-the-twelve of the standard frequency unit?

ANSWER: terahertz [or THz; accept submillimeter; prompt on microwave or infrared with "what frequency scale within that range?"]

<Physics, Jonathen Settle>

9. A two-movement concerto in F minor by this composer features an extended wordless *vocalise* (“voh-kuh-LEES”). This composer was advised by Ksenia Erdely in writing the solo part of another of his concerti which, like his *Impromptu* for the same instrument, begins with the soloist playing rolled chords in both hands. The second movement of a B minor symphony by this composer opens with violins playing high notes *sul ponticello* (“sool pon-tih-CHEL-loh”), which are interrupted by a contrabassoon depicting the brigand Solovei. At the Kiev school of music, this composer taught (\*) Nikolai Mayaskovsky and Sergei Prokofiev, helping earn him the nickname “Father of Soviet Composers.” His pieces include a concerto for coloratura soprano, a Horn Concerto in B-flat, a Harp Concerto in E-flat, and the Symphony No. 3 “Ilya Muromets.” For 10 points, name this early 20th century Russian composer whose surname is of German, not French, origin.

ANSWER: Reinhold Glière [or Reinhold Ernest Glier]

<Classical/Opera, Will Alston>

10. In a story from *On the Origin of the World*, this figure created an androgynous human by putting a "droplet of light" into a flowing river. In the same story, this figure sent the Serpent to the Garden of Eden in order to liberate mankind from the Father God. In the *Apocryphon of John*, this figure was banished after engaging in "creative acts" without the consent of the Bythos. After being cast out from the Pleroma, this figure accidentally created the first Archon, a lion headed serpent named Yaltabaoth. According to the Sethian creation myth, (\*) Eve was the victim of an attempted rape by the Demiurge, because she contained the essence of this figure. This lowest of the Emanations of God was commonly equated with the Bride of Christ and the Mother Goddess. For 10 points, name this Gnostic goddess, the personification of wisdom.

ANSWER: Sophia [or Pístis Sophía; accept Achamōth or Prunikos; prompt on Wisdom before read; prompt on the light of God; reject "knowledge" or "gnosis"; reject "Demiurge"]

<Misc Belief, Brad McLain>

11. These enzymes are upregulated by C·D·147 or EMMPRIN. Most of these enzymes have a propeller-shaped hemo·pexin domain that assists substrate-binding. Membrane-tethered examples of these enzymes are stored in actin-rich protrusions known as invadosomes. These proteins were originally discovered by Gross et al to degrade tadpole tails during metamorphosis. A lyophilized solution of D·N·ase, Dispase, and one of these enzymes is commonly used to form cell suspensions. Human neutrophils uniquely produce the 9<sup>th</sup> member of this enzyme family in the absence of the inhibitory protein T·I·M·P·1 at (\*) primary tumor sites. When co-cultured with carcinoma cells, fibroblasts upregulate these enzymes, which are responsible for liberating growth factors like P·D·G·F during angiogenesis. This class of enzymes includes stromelysins, gelatinases, and collagenases. For 10 points, name this class of enzymes responsible for degrading the basement membrane.

ANSWER: matrix metalloproteinase [or MMPs; accept matrix metalloproteinase or MMPase or matrixin; accept collagenase before mention due to some of the clues being specific to those, prompt on proteases; prompt on gelatinase or stromelysin with “are part of what more general enzyme family?”]

<Biology, Ryan Humphrey>

12. As he watches his friend decorate a house, a character in this novel recalls a time in college when that friend’s “imaginary houses” were burned down by another friend who had gotten too stoned in Hood Hall. An artist in this novel develops a crystal meth addiction despite the success of his show “Everyone I’ve Ever Known.” A lawyer in this novel has feverish dreams of being sexually abused in a monastery in Montana. That man in this novel has his leg amputated after years of suffering from a crippling (\*) limp, which had earlier caused his abusive boyfriend Caleb to reject him. This novel, a National Book Award finalist in 2015, follows three decades in the lives of four friends in New York: the actor Willem, the struggling architect Malcolm, the Hatian-American painter JB, and the self-harming lawyer Jude. For 10 points, name this bestselling novel by Hanya Yanagihara.

ANSWER: A Little Life

<Long Fiction, Will Alston>

13. This person established that an individual must be a “reasonable creature,” *in rerum natura*, and in the “King’s peace” to be subject to the “Born alive” rule. This person drafted a document which forbade the practice of raising royal funds via patent grants, called the Statute of Monopolies. This person snarled “I thou thee, thou traitor” during the trial of a man for participating in the Main Plot. The first part of this person’s magnum opus consists of commentaries on Thomas Littleton’s writings about (\*) land tenure, while the second part contains a lengthy exposition on Magna Carta. This person, who prosecuted Sir Walter Raleigh for treason, wrote a series of treatises defending the principles of medieval common law against Stuart encroachment. For 10 points, name this leading jurist of the Elizabethan and Jacobean eras who wrote *Institutes of the Lawes of England*.

ANSWER: Sir Edward Coke (“cook”)

<Commonwealth/Misc. History, Will Alston>

14. In an essay explaining the role of divinity in his philosophy, this man contrasted Muhammad as the messenger of God, Jesus as the son of God, and Krishna as the god of gods with the role of another figure as

the son of a man. In another work, this man argued that the Aryan invasion theory was based on a misunderstanding of the word *anās* in Vedic literature, arguing that it referred to a way of speech and not the shape of the nose. In addition to writing *Buddha and the Future of His Religion*, this man outlined a rejection of the (\*) varnas in his magnum opus, *The Buddha and His Dhamma*. One action taken by this man is commemorated on Dhammachakra Pravartan Day. Along with the Buddha, this man is the primary dedicatee of Navayana and Neo-Buddhist shrines. This man led his followers in a ritual burning of the Laws of Manu and a recitation of the 22 Vows during mass conversions. For 10 points, name this Indian social reformer, the founder of the Dalit Buddhist Movement.

ANSWER: Bhimrao Ramji Ambedkar [or Babasaheb Ambedkar]

<Theology/Practice, Brad McLain>

15. *Specific term required.* Peter Auer proposed a continuum in which this practice transitions to a one labeled “FL” as exemplified by *colonos* in Brazil. This practice is done to strategically establish sets of “rights and obligations” and establish solidarity according to the “markedness model.” Children and ethnic Luo customers at stores in Nairobi were studied to examine the “social motivations” of this practice by Carol Myers-Scotton. Korean speakers may perform this practice when they ask if it is okay to “lower” to *panmal*, while Japanese speakers do it when (\*) modifying the level of *keigo* to use, thus altering their politeness. The less common entities used in this practice are called “embedded” ones, as contrasted with socially dominant “matrix” ones. In the U.S. young heritage speakers often do it when going home from school. For 10 points, name this practice of changing registers or languages in conversation.

ANSWER: code switching [prompt on changing languages or changing registers or similar]

<Social Science: Ling, Will Alston>

16. In a poem by this author, a prophetess curses an “idle dreamer” who mixed “honesty with what belongs to love” and explains that “women here below can serve only one master” to her lover Hippolyta. Another poem by this author claims that violating the “established cult” by having heterosexual relations caused “the virile Sappho, paramour and poet” to “[die] the day of her blasphemy.” This poet beseeches one who teaches the “taste for Heaven / To the cursed pariah, even to the leper” in yet another poem, which concludes with a six-line (\*) prayer that the speaker shall rest between the title figure’s brows by the Tree of Knowledge. This author’s poems “The Damned Women” and “Lesbos” were among the six censored from the first edition of his best-known collection, which also contains a poem that bids the “Wisest of Angels” to “take pity on my long despair!” For 10 points, name this poet who included “The Litanies of Satan” in *The Flowers of Evil*.

ANSWER: Charles Baudelaire

<Poetry, Will Alston>

17. In a film titled for one of these objects, a local sprawled beneath a tree wakes up and tells the camera, “Death, like, life, is forever.” In another film, a squadron of students emerges from the mist to sing a song praising one of these objects in North Korea. Ken Adam was given a million dollar budget to make a set depicting the interior of one of these objects, which took up the entire back lot of Pinewood Studios since it had a working monorail and launchpad. A 2005 film used footage of one of these objects shot by Ron Frick, as well as a number of gel-covered lights aimed at a river made from 15,000 gallons of (\*) methylcel food coloring, to depict a planet inspired by these objects. Several Werner Herzog films, including *Encounters at the End of the World*, interview scientists who study these things. For 10 points, give these geographic features, one of which is used as a SPECTRE base in *You Only Live Twice* and another of which inspired Mustafar in *Revenge of the Sith*.

ANSWER: volcanoes [prompt on mountains]

<OArts: Film, Itamar Naveh-Benjamin / Ike Jose>

18. Ibn al-Haytham (“ib nal-HYE-thum”) wrote that this text misunderstands the “configuration of the world,” which he expanded on in his book of “doubts” concerning this text’s author. The first Latin edition of

**this text, prepared by Henricus Aristippus, was never as widely used as that of Gerard of Cremona. Notes on this text by Pappus were included in the commentaries on it by Theon, who credited his daughter Hypatia with preparing an edition of this text's third book. Most (\*) *zij* ("zeej") guides were modeled on a companion to this text called the "Handy Tables." The Alfonsine ("al-FON-seen") tables were produced using the methods outlined in this book for correcting for deviations using equants and epicycles. This text, which incorporates the catalogue of Hipparchus, outlines a paradigm that was largely displaced in the Copernican Revolution. For 10 points, name this treatise on astronomy by Claudius Ptolemy.**

ANSWER: Almagest [or *al-Majisti* or *Megiste* or *Hē Megalē Syntaxis* or *Mathēmatikē Syntaxis* or *Magna Syntaxis*; prompt on reasonable answers indicating Ptolemy's book on astronomy etc.] (Alhazen's work is titled *Doubts on Ptolemy*.)

<Euro History, Will Alston>

**19. A Japanese saying and pun about this city claims that you should never say "magnificent" or "enough" before seeing its beauty. 14,000 cryptomeria trees line an avenue in this city, making it the world's most tree-lined street. Ingredients for this city's scrumptious shaved ice are harvested annually from nearby Lake Chuzenji, which lies beneath the inactive volcano Nantai. A group of three monkeys enshrined in this city gave rise to the proverb "see no evil, hear no evil, speak no evil." Three mountain *kami* sacred to this seat of (\*) Tochigi Prefecture are enshrined in its Rinno-ji Temple. That temple contains this city's Taiyūin ("tie-you-eeen") Mausoleum, which honors a deified *gongen* form of Iemitsu, who once led a shogunate. For 10 points, what city north of Tokyo is home to a prominent Tōshō-gū shrine honoring Tokugawa Ieyasu?**

ANSWER: Nikko

<Geography, Ike Jose>

**20. The drum represents key constraints on this task in the drum-buffer-rope methodology for it that was introduced in *The Goal* by Eliyahu Goldratt. The central objects of this task are separated into two columns sometimes labeled SPT and LPT in Johnson's rule for optimally performing it for a constrained flow shop. Negative float appears if a constraint is not satisfied when using the critical path method for this task. This task is accomplished by assigning orientations to the undirected edges of a disjunctive graph such that the resulting graph is acyclic. The open shop version of this task does not impose an ordering constraint unlike the (\*) JSSP. Arrows are added to indicate dependencies in a horizontal bar chart used to visualize the results of this process created by Henry Gantt. This process, which can be considered with or without preemptions, can be solved by minimizing such objectives as makespan and slack time. For 10 points, name this task of ordering jobs to meet their due dates.**

ANSWER: scheduling [accept planning; prompt on operations management]

<Other Science: Applied/Data Science/Engineering, Jonathen Settle>

## BONUSES

1. This many tables are used during the meal times at the Berghof sanatorium, where a carnival takes place this many months after Hans's arrival. For 10 points each:

[10m] Give this number. In the same novel, the Italian word for this number is found in the surname of a character who intellectually spars with a Jewish convert to Catholicism named Leo Naphta.

ANSWER: **seven** [prompt on Settembrini by saying "we're looking for the number in his name"] (The character is Ludovico Settembrini.)

[10e] In this novel, Settembrini mentors Hans Castorp during his seven-year-long stay at Berghof.

ANSWER: *The Magic Mountain* [or *Die Zauberberg*] (by Thomas Mann.)

[10h] The second chapter of *The Magic Mountain* is titled for one of these religious objects and recounts Hans visiting his grandfather, who shows him an ornate example of them used by seven generations of Castorps.

ANSWER: christening **basins** [or **baptismal font**, or **baptismal bowl**; prompt on bowl]

<Long Fiction, Will Alston>

2. Some of these statements used to define the existence of large cardinals usually assert that there is a non-trivial elementary embedding of the universe into an inner model. For 10 points each:

[10e] Name these statements that, like postulates, are self-evident, and thus assumed to be true without proof.

ANSWER: **axioms**

[10h] This program in the foundations of mathematics attempts to determine the minimum set of axioms necessary to prove a theorem. RCA-sub-0 and WKL-sub-0 are two of the "Big Five" subsystems used in this program.

ANSWER: **reverse** mathematics

[10m] This term describes the arithmetic system chosen for use in reverse mathematics due to its closeness to computability theory. Another system known by this term is the weakest for which the Löwenheim–Skolem theorem does (emphasize) *not* hold.

ANSWER: **second-order** [accept **second-order** arithmetic; accept **second-order** logic]

<Other Science: Math, Jonathen Settle>

3. For 10 points each, name some people who were given the Moses treatment and floated down a river as infants.

[10m] This King of Anga was abandoned in a river to protect his mother's honor and was later rescued and raised by Radha. This tragic hero is killed near the end of the Kurukshetra War when his chariot becomes stuck in mud.

ANSWER: **Karna** [or **Vaikarhana**]

[10e] According to legend, this figure was placed on a board and floated down the Yangtze as a baby. In his most famous appearance, this monk was accompanied by the Monkey King Sun Wukong on a journey to retrieve Buddhist scriptures from India.

ANSWER: **Tang** Sanzang [or **Tang** Seng; or **Sanzang**; accept **Tripitaka**; accept **Xuanzang**, **Chen** Hui, or **Chen** Yi]

[10h] In an attempt to avoid paying a bride price, this hero's father seals him inside of a drum and casts him into a river. This Congolese hero later travels to the underworld in search of his father, where he beats the god of death, Muisa, flat with his conga scepter.

ANSWER: **Mwindo**

<Legends, Brad McLain>

4. For 10 points each, answer the following about the unfortunate Egyptian vassal king Rib-Hadda.

[10m] Rib-Hadda ruled this city which, along with Sidon and Tyre, was one of the chief cities of Phoenicia. Important finds in this city include the sarcophagus of Ahiem and the well-preserved Temple of Obelisks.

ANSWER: **Byblos** [or **Kebny**, or **Gebal**, or **Gubla**, or **Jbeil**]

[10e] We know of Rib-Hadda from decades of these letters, in which Rib-Hadda always asserts his utmost loyalty, but complains that Egypt has not sent him garrison troops. These letters are named for Akhenaten's capital city.

ANSWER: **Amarna** Letters

[10h] We later learn that Rib-Hadda lost his throne because he didn't get any garrison troops when his Amorite rival, Abdi-Ashirta, recruited these people to attack Byblos. Many more Amarna letters complain about this group of Levantine outlaws and raiders, who helped a deposed king of Aleppo named Idrimi seize the throne of Alalakh.

ANSWER: **Habiru** [or **Apiru**; prompt on **Hebrews** or **Jews** or **Yehudim** because many historians have suggested historical parallels/conflation]

<Ancient History, Will Alston>

5. Amazingly, three of this artist's "radiating fan" paintings were sold for \$25,000 at a 2005 auction where works by Warhol and Renoir went unsold. For 10 points each:

[10h] Name this "lyrical abstract impressionist" artist, whose talent was first observed by Desmond Morris. In 2019, London's Mayor Gallery hosted an exhibition of this non-human artist's work subtitled "The Birth of Art."

ANSWER: **Congo**

[10e] Like Congo, this other chimpanzee was highly interested in typical human behaviors, including drinking gin and masturbating to *Playgirl* magazines. This chimp was named for an *Australopithecus* skeleton discovered in Ethiopia, which provided one of the earliest examples of hominid bipedalism.

ANSWER: **Lucy**

[10m] In a much less fun context, chimpanzees were observed engaging in this "war" named for the Tanzanian national park it occurred in. This conflict started after the Kahama community broke away from the Kasakela, after which the Kasakela killed all of the Kahama males.

ANSWER: **Gombe** Chimpanzee War

<Other Academic, Brad McLain>

6. This complex is documented in the coffee table book *Reaching for the Sky*, which contains numerous photographs and notes on how a Boston-based firm built the world's largest infinity pool in it. For 10 points each:

[10h] Name this Asian integrated resort that is home to a large casino. Its three main towers have a shape reminiscent of a deck of cards.

ANSWER: **Marina Bay Sands** Resort

[10m] Singapore's Marina Bay Sands was designed by this architect's firm, which also made the Crystal Bridges Museum in Arkansas, and the headquarters of Bureau of Alcohol, Tobacco, Firearms, and Explosives.

ANSWER: Moshe **Safdie**

[10e] Safdie also designed the Yitzhak Rabin Center in this coastal Israeli city, whose White City is home to a number of buildings in the International Style.

ANSWER: **Tel Aviv**

<OArts: Architecture, Ike Jose>

7. Among this organization's lesser known legislative achievements is the passage of age of consent laws, particularly in the South, to reduce the exploitation of domestic workers. For 10 points each:

[10m] Name this organization whose leader Frances Willard promulgated the motto "Do Everything" while leading it from 1878 until her 1898 death.

ANSWER: **WCTU** [or **Women's Christian Temperance Union**]

[10e] One of Willard's many objectives was the limitation of the standard work day to this many hours, which was first established in the U.S. for railroad workers via the Adamson Act of 1916.

ANSWER: **eight** hours

[10h] In 1883, Willard wrote this document which encouraged leaders worldwide to oppose the trades in alcohol and opium, and then sent Mary Clement Leavitt on a world tour promoting this document.

ANSWER: **Polyglot Petition**

<American History, Will Alston>

8. This movement's writers included the Wellesley graduate Bing Xin ("bing shin"), who is honored by a museum in Fujian for writing the series *To Young Readers* and translating the works of Tagore and Gibrán. For 10 points each:

[10m] Name this Chinese literary and intellectual movement of the 1910s and 20s, many of whose writers were participants in the politics of the May Fourth Movement.

ANSWER: **New Culture** Movement [or **Xin wenhua** yundong]

[10e] The leading writers of the New Culture Movement included this author of the collection *A Call to Arms*, which contains his story "The True Story of Ah Q."

ANSWER: **Lu** Xun [or **Zhou** Shunren]

[10h] This other New Culture writer declared in 1916 he would only write in *baihua*, or vernacular, and argued for the modernization of writing by saying "old bottles cannot hold new wine." This so-called "Father of the Chinese Renaissance" examined the phrase *chabuduo* ("chah-boo-dwoh") in his story "The Life of Mr. Close Enough."

ANSWER: **Hu Shih** [or **Hu Suh**; prompt on **Hu**]

<Misc. Lit, Brad McLain/Will Alston>

9. This quantity and vortex strength are constant along vortex tubes by Helmholtz's theorems. For 10 points each:

[10m] Name this quantity denoted capital gamma. For a thin airfoil in inviscid potential flows, the Kutta-Joukowski theorem states that lift force equals negative pressure times fluid velocity times this quantity.

ANSWER: **circulation**

[10h] Horseshoe vortices are superimposed on top of each other in this theory to obtain the circulation distribution. This theory predicts that wings of large aspect ratio oscillating at low frequency in inviscid compressible flow will have a ratio of induced drag to total lift proportional to one over aspect ratio..

ANSWER: **lifting-line** theory

[10e] Lifting line theory gives a relationship between the circulation distribution and this quantity. The lift coefficient is maximized at the critical value of this quantity, which is around 20 degrees for most wing types.

ANSWER: **angle of attack**

<Physics, Jonathen Settle>

10. For 10 points each, answer the following about the French cabinetmaker Andre-Charles Boulle.

[10m] Boulle is primarily remembered for his skill in marquetry, in which he would inlay this material, pewter, and bronze into furniture. The ancient Greek lyre is believed to have been originally made from this material.

ANSWER: **tortoiseshell** [or **turtleshell**; accept **turtle** or **tortoise**]

[10e] Boulle was patronized by this monarch, for whom he made several tortoiseshell armoires, cabinets and commodes. He is magnificently dressed in a portrait of him by Hyacinthe Rigaud (“yuh-SAHNT ree-GO”).

ANSWER: **Louis XIV** [or **Louis the Sun King**; prompt on **Louis**]

[10h] Boulle’s work also included this dangerous technique in which gold and mercury were mixed together, solidified, and then applied to furniture. Because the fumes of mercury are incredibly hazardous, those who performed this technique often died young.

ANSWER: **ormolu**

<Painting/Sculpture, Ike Jose>

11. A short poem by Gerard Manley Hopkins twice asks “How can he be? The words are wild” in attacking the ridiculousness of a line from this poem. For 10 points each:

[10m] Name this short poem which asserts “And I could wish my days to be / bound each to each by natural piety” after proclaiming “The Child is father of the man.”

ANSWER: “**My Heart Leaps Up**” [accept “The **Rainbow**”]

[10e] This British Romantic used three lines from his poem “My Heart Leaps Up” as the epigraph to his much longer poem “Ode: Intimations of Immortality.”

ANSWER: William **Wordsworth**

[10h] On the other hand, Hopkins was fond of using this phrase by Wordsworth to describe the purpose of “instress” and “inscape.” An incident in which Wordsworth forgot about the premature death of his daughter inspired the poem of this title, which is immediately followed by the phrase “impatient as the wind.”

ANSWER: “**Surprised by Joy**”

<Poetry, Will Alston>

12. Answer the following about the role of cholecystokinin, or C·C·K, as a neuropeptide, for 10 points each.

[10e] *Description acceptable.* C·C·K acts to produce this sensation by releasing P·Y·Y and inhibiting neuropeptide Y. Leptin also stimulates this sensation, so people resistant to leptin are more likely to gain weight.

ANSWER: **satiety** [accept feeling **full**; accept **no appetite**; accept descriptions of **not wanting to eat**]

[10m] C·C·K stimulates neurons in this nucleus in the hypothalamus. The posterior pituitary receives projections from the supraoptic nucleus and this nucleus, which are the major sources of oxytocin and vasopressin.

ANSWER: **paraventricular** nucleus [or **PVN**]

[10h] Neuropeptide Y is synthesized and secreted from this hypothalamic nucleus, which also has populations of neurons that secrete agouti-related peptide and CART.

ANSWER: **arcuate** nucleus

<Biology, Jonathon Settle>

13. This man and Jean Bricmont (“breek-MOHN”) collaborated on *Fashionable Nonsense*, which further explicates his role in the 1996 “affair” named for him. For 10 points each:

[10e] Name this physicist who outlined a “hermeneutical” theory of “quantum gravity” in a hoax article he submitted to the journal *Social Text*.

ANSWER: Alan **Sokal** [or Alan David **Sokal**]

[10h] This thinker argued that, because *Social Text* was a “journal of tendency,” its editors had no reason to assume Sokal was making factual claims, but rather merely ethical ones. This philosopher argued that the production and ownership of intellectual property has produced a new class division in *A Hacker Manifesto*.

ANSWER: McKenzie **Wark**

[10m] Wark also criticizes Sokal for failing to understand that science is a form of “constrained story-telling,” a claim that Wark borrowed from this thinker’s book *Primate Visions*. This thinker also wrote *Situated Knowledges*.

ANSWER: Donna **Haraway** [or Donna Jeanne **Haraway**]

<Philosophy, Ike Jose>

14. For 10 points each, answer the following about the far-flung origins of the modern Malagasy people:

[10e] A small number of Arab traders, mainly from this present-day country, came to the island a few centuries after its first Austronesian settlers. This Arab country, formerly led by Sultan Qaboos, also once controlled Zanzibar.

ANSWER: Sultanate of **Oman**

[10m] Significant migration to Madagascar from East Africa continued while part of the island’s coast was controlled by this medieval sultanate, which ruled the coasts of present-day Tanzania and Kenya for six centuries.

ANSWER: **Kilwa** Sultanate

[10h] The closest Austronesian relatives of the Malagasy - and therefore, likely Madagascar’s first settlers - were the Banjars and these people, whom the Banjars may have brought there as servants. These people were legendary for their headhunting before signing a treaty which banned the practice in 1894.

ANSWER: **Dayaks** (Both peoples are mainly on Borneo.)

<World History, Will Alston>

15. The “Royal Hunt and Storm” that bridges two acts of this opera is often excerpted as an orchestral piece and features a chorus shouting “Italie! Italie! Italie!” For 10 points each:

[10m] Name this opera in which Chorèbe (“koh-REB”) tells his fiancé to not worry about an object at the center of a great parade during the first act. This grand opera ends after Didon (“dee-DOHN”) stabs herself with a sword.

ANSWER: *Les* **Troyens** [or *The* **Trojans**]

[10e] Hector Berlioz acknowledged this piece as the influence for the “people’s chorus” in Act III of *Les Troyens*. The American piece “My Country, 'Tis of Thee” uses the tune of this unofficial British national anthem.

ANSWER: “**God Save the Queen**” [or “**God Save the King**”]

[10h] Performers of Aeneas’s tenor role in *Les Troyens* often omit the high C from its aria titled for “useless” or “inutiles” examples of these notions. These notions also name a *chanson* by Josquin des Prez which was a favorite of emperor Charles V and based on a French love song.

ANSWER: **regrets** [accept “Inutiles **regrets**” or “Mille **regretz**”]

<Classical/Opera, Will Alston>

16. The term for these groups was coined in the essay “The Social Structure of a Mysore Village” by the anthropologist M. N. Srinivas. For 10 points each:

[10h] Give this term from Indian politics which refers to blocs of extremely reliable political supporters. The BJP often claims to “reject” politics based on these groups and charges the INC with using Muslims as one.

ANSWER: **vote banks** [reject all other answers]

[10e] That being said, the BJP has been eyeing the BSP party, which is based in this state and mainly represents Scheduled Tribes and other minorities, as a vote bank. This state with capital Lucknow is India’s most populous.

ANSWER: **Uttar Pradesh**

[10m] BJP critics often charge that it has created its own vote bank of right-wing religious nationalists based on this ideology developed by B. D. Savarkar, which is the guiding ideology of the RSS and BJP. Give the specific term.

ANSWER: **Hindutva** [prompt on Hindu nationalism or Hindu-ness]

<Modern World, Will Alston>

17. Answer the following related to the chemistry of Matryoshka doll-like compounds, for 10 points each.

[10e] Chemists design self-assembling multilayered cage compounds to study these icosahedral viral structures. Coat proteins make up these structures.

ANSWER: nucleoc**apsids**

[10m] The first artificial sphere-in-sphere compound was created using a self-assembly procedure with this property by Makoto Fujita’s team. In organic syntheses, deprotection schemes with this property remove protecting groups one at a time without affecting other groups.

ANSWER: **orthogonal** [or **orthogonality**]

[10h] Gong, Wanjun, et al. threaded a naphthalene derivative through this chemist’s “little blue box” while it was encapsulated inside cucurbit[10]uril. One-third of the 2016 Nobel was awarded to this Northwestern University professor for his work on mechanically interlocked molecules, including molecular Borromean rings.

ANSWER: Sir J. Fraser **Stoddart**

<Chemistry, Jonathen Settle>

18. Several members of the Chickasaw nation in this state reflect on the parallels between their condition and the escaped slave whom they are chasing in the story “Red Leaves.” For 10 points each:

[10e] Name this state which is the setting of most of the short stories in the collection *These 13*, as well as the later ones collected in *Go Down, Moses*.

ANSWER: **Mississippi** (Those works are all by William Faulkner.)

[10m] The Crane family moves back to Mississippi and witnesses horrifying racial violence in this author’s story “Isabelle.” In another story set in the South by this author, Mr. Alsuga burns his theme park down to collect the insurance money after a hired guard executes a teenager for candy theft.

ANSWER: George **Saunders** (The latter story is “CivilWarLand in Bad Decline.”)

[10h] This longtime Ole Miss professor wrote many sardonic, Gothic short stories set in that state, which are found in such collections as *Airships*, *Bats Out of Hell*, and *High Lonesome*.

ANSWER: Barry **Hannah**

<Short Fiction, Will Alston>

19. Economist Ignacio Palacios-Huerta showed that models where players use these sorts of strategies can accurately model how often soccer players choose to kick right or left in penalty kicks. For 10 points each: [10m] Give these strategies, named in analogy to quantum mechanics. In a Nash equilibrium of them, each player has a probability of choosing a given action that makes the other indifferent among their actions.

ANSWER: **mixed** strategies [or **mixed** strategy Nash equilibrium; prompt on **random** strategies]

[10e] A mixed strategy Nash equilibrium exists for this game, also known as “Bach or Stravinsky.” In this game, two members of a couple each choose whether to go to the opera or a football match.

ANSWER: **Battle of the Sexes** [or **BoS**]

[10h] By the Harsanyi “purification theorem,” all mixed-strategy Nash equilibria are limits of pure strategy equilibria in games with this property. Marzena Kryszkiewicz (“k’shish-K’YE-vich”) proposed an extension of rough set theory to improve induction in systems with this property.

ANSWER: the players have **incomplete information** [prompt on **incomplete**; accept answers indicating that players **lack full information**; do not accept or prompt on “complete information” or “full information” or “imperfect information”]

<Social Science: Econ, Will Alston>

20. Based on the bizarre fear that these institutions were being used to nurture a socialist revolution, Prussia ordered all of them within its territory to be closed in 1851. For 10 points each:

[10m] Name these institutions, the first of which was established by Friedrich Fröbel in Bad Blankenburg. Elizabeth Peabody founded the first one to use the English language in the U.S. after many were built by German immigrants.

ANSWER: **kindergartens** [prompt on **schools** or **children’s schools**]

[10h] Fröbel was a student of this Swiss educator and co-names the first dedicated early childhood teaching academy with him. His efforts at the Yverdon institute helped nearly eradicate illiteracy in Switzerland by the 1830s.

ANSWER: Johann Heinrich **Pestalozzi**

[10e] This Welsh industrialist and reformer founded his own infant’s school in 1819 near his textile mill at New Lanark. He later moved to America and founded the utopian community of New Harmony.

ANSWER: Robert **Owen**

<Euro History, Will Alston>