Pre-ICT and Nationals Open/Minnesota Open 2019 (PIANO/MO): "What about bad subject matter? Or a bad title drop, even? That could kill a tournament pretty good."
Written and edited by Jacob Reed, Adam Silverman, Sam Bailey, Michael Borecki, Stephen Eltinge, Adam S. Fine, Jason Golfinos, Matt Jackson, Wonyoung Jang, Michael Kearney, Moses Kitakule, Shan Kothari, Chloe Levine, John Marvin, and Derek So, with Joey Goldman and Will Holub-Moorman.

Packet 2 Tossups

1. **Manganese sulfate is used to induce this biological pathway in the lab. This process is globally regulated by sigma factor H in the best-studied phosphorelay system, and it can be detected by staining with malachite green followed by safranin. Synthesis of dipicolinic acid and small acid-soluble proteins is upregulated during this pathway. Along with low GC content, this behavior characterizes most Firmicutes. Competition between this behavior and cell** (*) death is the main constraint when designing continuous sterilizers. This behavior, which has been extensively studied in *Bacillus* species *megaterium* and *subtilis*, is a form of asymmetric mitosis triggered by inhospitable environments in which a tough, durable daughter cell is encased by the mother cell. For 10 points, name this process by which bacteria create dormant offspring covered by a tough shell.
ANSWER: **sporulation** [or forming **endospore**s; or forming **spore**s] <AS>

2. **A "schizo-eclectic" piece from *this* country is subtitled "Say sea, take me!" in reference to the influence of Debussy's *La mer* on the composer. A one-movement piece from this country includes several long pauses during which poetry by Rabindranath Tagore is to be recited. After hearing that piece from this country, *Eclipse*, Leonard Bernstein made suggestions that inspired its composer to write the piece (*)** *November Steps*. A pianist born in this country won the 1989 Instrumental Gramophone Award for her recording of all eighteen Mozart piano sonatas. The book *Absolutely on Music* details "conversations" with a conductor from this country who was known for wearing a signature white turtleneck during his 29 year tenure as conductor of the Boston Symphony Orchestra. For 10 points, name this birthplace of Tōru Takemitsu, Mitsuko Uchida, and Seiji Ozawa.
ANSWER: **Japan** [accept **Nihon**-koku or **Nippon**-koku] (The "schizo-electric" piece is Takemitsu's *Quotation of Dream*.) <WJ>

3. **A 2013 book by Jessica Lepler argues that there were "many" of this 19th-century event and unifies Richard Timberlake's theory that its causes were purely domestic with Peter Temin's theory that its causes were international. The "Not Cent" is the most famous example of satirical money called "Hard Times Tokens" that were made during this event. During this event, a mob ransacked Eli Hart's trading company and pelted police with dough in New York's (*)** "Flour Riot." A cartoon about this event depicts an outgoing president as "The Modern Balaam and his Ass." A "Divorce Bill" tried to separate the government from this event's causes, which included lending by wildcat "pet" banks. A key trigger of this event was a mandate that federal land be bought only with gold or silver. Levi Woodbury's Specie Circular triggered—for 10 points—what financial crisis brought on by Andrew Jackson?
ANSWER: **Panic** of **1837** [prompt on answers like the (Second) **Bank War** or the **Jackson**–**Biddle** feud with "which contributed to what event?"; prompt on Panic of **1839** with "which exacerbated what earlier event?"] <JG>

4. **A poem in this language says "You spoke of Jack London, money, love and passion / I saw just Gioconda which had to be stolen." Another poem in this language ends: "don't you see – / I am crucified to the paper / with the nails of words." That poem in this language begins with a raised "chalice of wine…as a drinking skull filled with verses," and is presented "just in case" as a "farewell concert." Another poem in this language opens mocking "Your thought / musing in those brains of (*)** oatmeal / like a bloated functionary on an oily sofa." That man used this language for the manifesto *A Slap in the Face of Public Taste* and the poems "Backbone Flute" and "A Cloud in Trousers." Its Silver Age was exemplified by the Acmeist movement of poems like "Poem without a Hero" and "Requiem." For 10 points, name this language of Vladimir Mayakovsky and Anna Akhmatova.
ANSWER: **Russian** [or **Russki**] <JM>

5. **A paper by Jonathan Fox discusses the "authoritarian" form of a system named for *this* term in analyzing the "difficult transition from [it] to citizenship." An essay by James Scott argues that the decline in the protective capacity of kinship groups in Southeast Asia led *these* people to seek "dyadic ties" with people of a higher status. A system named for *this* term is both fostered by a state of poverty and incentivized to continue that state according to Herbert Kitschelt, who contrasts this system with (*)** "programmatic politics." In Ancient Rome, this term describes people who were often expected to support the initiatives of another group in the *comitia*. Freed Roman slaves automatically took this status in relation to their former masters. For 10 points, name these people who vote for a politician or party in a quid-pro-quo relationship that involves receiving protection or benefits from their "patrons."
ANSWER: **client**s [accept **clientelism**; prompt answers like voters or party members; prompt on patronage before "patron" is read; however, do not accept "patrons."] <WHM>

6. A "Plan" drawn up in this modern country is the only surviving Western architectural drawing between the Romans and the 13th century. A monk from Notker the Stammerer's monastery in this modern country wrote a major collection of early anecdotes about Charlemagne. One of the largest collections of early Medieval manuscripts was preserved in the library of Saint Gall in this country. A historian from this country claimed that the "the discovery of the world and of (*) man" accompanied the "development of the [modern] individual," which was manifested in "The State as a Work of Art." That historian from this country founded cultural history and popularized the term for the title era in his book *The Civilization of the Renaissance in Italy*. Jacob Burckhardt was from—for 10 points—what Central European country that formed from independent cantons?
ANSWER: **Switzerland** [or La **Suisse** or Die **Schweiz**] <JR>

7. **On MLK Day 2019, a Republican Senator from *this* state published a chart-laden op-ed in *National Review* asking if "populist conservatism" could unite "different races" in the "same boat." In 1993, a senator from this state, whose son later became a dietary supplement lobbyist, introduced the DSHEA** [dee-shay] **law exempting supplements from many FDA regulations. Two years ago, the then-mayor of this state's largest city stayed in the Road Home shelter for three days while disguised as a homeless person. In early 2019, its state legislature gutted Proposition (*)** 3, a voter-approved ballot initiative to expand Medicaid. This state's lone Democratic congressman, Ben McAdams, defeated black Republican woman Mia Love in 2018. Mike Lee became its senior senator after the retirement of Orrin Hatch. For 10 points, name this state where current U.S. Senator Mitt Romney helped run a Winter Olympics in Salt Lake City.
ANSWER: **Utah** <MJ>

8. **In this country, Armando Discépolo popularized a theatrical style called "grotesco criollo." A playwright from this country had audience members recreate the Milgram experiment in the site-specific *Information for Foreigners*. In a play from this country, Martin begins a relationship with a scratch-covered woman who insists that her prison smock is a ball gown while working for Frank, who says his Gestapo uniform is harmless fun. The play *The Camp* was written in this country by Griselda Gambaro. A novel from this country includes (*)** footnotes explaining psychoanalytic ideas about homosexuality, and ends with a protagonist's morphine-induced dream that he's sailing away with Marta. That novel from this country includes five summaries of film plots related to Valentín Arregui by Luis Molina in a prison cell. For 10 points, name this home of *Kiss of the Spider Woman* author Manuel Puig.
ANSWER: República **Argentina** [accept the **Argentine Republic**] <JG>

9. **A 1995 paper by Berry, Levinsohn, and Pakes uses random coefficients to perform *this* technique while avoiding the "independence of irrelevant alternatives." One method for performing this action was first applied to mass transit in the Bay Area, and assumes that personal idiosyncrasies follow an extreme value distribution. The "characteristics approach" for performing *this* action treats goods as bundles of properties in order to get around the problem of finding an unwieldy (*)** substitution matrix. Philip and Sewall Wright were among the first people to recognize the simultaneity problem in performing this technique, which they got around by inventing instrumental variables. Failing to recognize price endogeneity can cause this technique to give implausible results like curves that slope upward. For 10 points, name this technique for finding out how much people are willing to buy at a particular price.
ANSWER: **demand estimation** [or supply and **demand estimation**; do not accept only "supply estimation;" prompt on discrete choice estimation or discrete choice modeling before "Wright"] <SB>

10. **The two bands in Raman spectroscopy of graphene are labelled for G and this other letter, corresponding to about 1350 wavenumber. This letter appears in the term symbol for actinium. A capital *T* subscripted by this letter represents the pure tetrahedral point group. Charge-transfer complexes are usually labelled using "[this letter]-dash-A". The point group of carbon dioxide includes this capital letter, which corresponds to symmetries with a (*)** "*C*-sub-*n*" axis and "*n C*-sub-2" axes. On a Fischer projection, this letter designates sugars that have the bottom hydroxyl group on the right, as in the most common stereoisomer of glucose, which also begins with this letter. It also labels the yellow emission line for the sodium doublet. For 10 points, name this letter that symbolizes the periodic table block containing transition metals.
ANSWER: **D** <AS>

11. **An artist from this city painted a 1577 marriage self-portrait in which she plays the harpsichord. A painter from this city had the title figures adopt poses in crossed diagonal lines in his *Atalanta and Hippomenes*. Lavinia Fontana was from this city, which was the birthplace of a man who decorated the Chapel of San Gennaro in Naples. A painter from this city decorated the Palazzo Rospigliosi with the fresco *Aurora*. Another painter from this city depicted a biblical landscape in a 1604 (*)** lunette. An academy was founded in this city in 1585 to promote anti-Mannerist, "classicizing" painting. Domenichino and Guido Reni were both from this city, as was a painter who decorated the Farnese Gallery with the series *The Loves of the Gods*. The Carracci started a "School" of Baroque art in this city. A Flemish Mannerist sculptor's Italianized name prefixes "Giam" to the name of—for 10 points—what Italian city?
ANSWER: **Bologna** [accept **Giambologna**] ("Giambologna" is an Italianization of "Johannes de Boulogne.") <JR>

12. *Description acceptable.* **A 1990 book claims a relation between *this* practice and decorated initials, citing the works of Hugh of St. Victor, who described a particularly complicated version of this practice in one of his treatises on Noah's ark. This practice was held to be the medieval equivalent of "creativity" or "imagination" in a book by Mary Carruthers. A version of this practice was supposedly discovered after a banquet hall collapsed by Simonides of Ceos. Jonathan Spence used a technique from this practice to structure his biography of (*)** Matteo Ricci. Frances Yates's book on *The Art of* this practice explains its context between *elocutio* and delivery as one of the five canons of rhetoric. Grotesque images were imagined in a familiar location to create a "palace" used in this practice. For 10 points, name this practice that orators used to deliver their speeches without reading.
ANSWER: **memory** [or **mnemotechnic**s; accept *ars **memorativa*** or *ars **memoria**e*; accept **mnemonic**s; accept any answer describing **memorization** or similar; accept *The **Art of Memory*** or *The **Book of Memory*** or *The **Memory Palace of Matteo Ricci***] <JR>

13. **The protagonist of one of this author's novels writes that "Algebra, like laudanum, deadens pain" before his fiancé dies of tuberculosis. This novelist fictionalized the years just before World War I in the novels *The Gate of Angels* and *The Beginning of Spring*. In another of this author's novels, Florence is run out of town after trying to open up the title store in a haunted house. This author won the Booker for an autobiographical novel in which (*)** Nenna is left by her husband on their houseboat in the Thames. The protagonist falls in love with the 12-year-old Sophie in the final novel by this author of *The Bookshop*, which was inspired by hearing musical settings of *Hymns to the Night*. For 10 points, name this British author of *Offshore* who fictionalized the life of Novalis in *The Blue Flower*.
ANSWER: Penelope **Fitzgerald** [or Penelope **Knox**] <JR>

14. **In the core region where this process occurs, a log-log plot of dimensionless position versus dimensionless velocity has a slope very close to one-seventh. A key result in a theory of this process guarantees that the *n*th moment of incremental length variation in *u* varies with the cube root of the incremental length. This process forces the local heat transfer coefficient to vary with position to the negative one-fifth, rather than the negative one-half version predicted by the Blasius solution. In this process, energy (*)** cascades down to a limiting minimum length scale symbolized eta, equal to the fourth root of viscosity cubed over the dissipation rate. This process arises from the nonlinear del-squared term in the Navier–Stokes equations, which makes it exceedingly difficult to model analytically. For 10 points, name this phenomenon that occurs at high values of Reynolds number.
ANSWER: **turbulence** [or **turbulent** flow; or other word forms; prompt on fluid <u>flow</u>] <AS>

15. **W.D. Hart created a needlessly graphic argument for this position that involves using a hacksaw to verify that you woke up with organs missing. Martine Nide-Rümelin used notions of "grasping phenomenal properties" to refine an argument for a type of this position, which exhibits a "pairing problem" according to Jaegwon Kim. In 1998, a thinker accepted the "abilities hypothesis" about his argument for this position, thus rejecting his own (*)** "Knowledge Argument" for it. Frank Jackson once advocated a form of this position called epiphenomenalism. This position has a "property" form and a "substance" form defended by a thinker who held that "clear and distinct" perceptions of a *res extensa* and a *res cogitans* imply that they are separate things interacting via the pineal gland. For 10 points, name this position advocated by René Descartes, which posits a distinction between mind and body.
ANSWER: mind-body **dualism** [accept word forms and descriptions of the position that **physicalism is false**; accept descriptions of a **mind-body distinction** until mentioned; accept **epiphenomen**alism and word forms until mentioned; accept specific types of dualism until mentioned; prompt on <u>emergent</u>ism or descriptions of the idea that <u>materialism</u> is <u>false</u>] <JG>

16. **A 2016 production by the Zurich Ballet restored a ballroom sequence from this ballet in which a ballerina clutches her partner's bent knee and extends her leg backwards in an *arabesque penchée*. A solo violin and cello accompany an Adagio in this ballet, in which a male dancer embraces his partner while bringing her outstretched arms to her sides. Just before that scene, four dancers interlace their arms in a sequence from this ballet punctuated by sixteen *pas de chat*. Its male protagonist breaks his (*)** crossbow after he and Benno meet a beautiful woman who gestures toward a pool of her mother's tears. This ballet's 1895 choreography by Marius Petipa was a collaboration with Lev Ivanov and Riccardo Drigo. This ballet's protagonist suffers from a curse inflicted by Von Rothbart. For 10 points, name this Peter Ilyich Tchaikovsky ballet about Siegfried's love for Odette, who daily turns into the title bird.
ANSWER: ***Swan Lake*** [or ***Lebedinoye ozero***] <SK>

17. **When one son of this man died in place of another, that son was compared to a "garden poppy, burst into red bloom," which "bends, drooping its head to one side, weighed down by…a sudden spring shower." The force of a thrown stone knocked out the eyeballs of another of this man's sons, who was compared to a "tumbler…diving for oysters" after falling out of his chariot. The youngest son of this man was murdered by Polymestor, and this man pressured the herdsman (*)** Agelaus to kill an unwanted son of his. Despite taking sanctuary on the altar of Zeus Herceius, this father of Gorgythion and Cebriones was killed when he slipped in the blood of his son Polites. A disguised Hermes helped this man reach the tent of an enemy warrior so that he could attempt to ransom his eldest son. For 10 points, name this father of Polydorus, Paris, and Hector, the king of Troy during the Trojan War.
ANSWER: **Priam** [accept **Podarces**] <MK>

18. **Supporters of this cause organized nationwide general strikes on June 7 after its leader was imprisoned on charges that became the Agartala Conspiracy Case. This cause was supported by posters reading "Annihilate these demons". This cause was opposed by the paramilitary Razakars, who were ethnically segregated into units called Al-Badr and Al-Shams. Support for this cause grew out of the Six Point Movement, which was backed by rebel groups called *bahini*s. This cause was mostly opposed by (*)** Biharis, whose persecution by its proponents led to a genocidal crackdown called Operation Searchlight. A current prime minister and leader of the Awami League is the daughter of this cause's leader, Sheikh Mujibur Rahman, who founded a government-in-exile in Kolkata after an invasion by Yahya Khan. For 10 points, what cause was achieved with the 1971 liberation of former East Pakistan?
ANSWER: **Bangladesh**i **independence** [or **Muktijuddho**; or the **independence** of **East Pakistan**; or the **independence** of **East Bengal**; accept anything indicating **Bangladesh** becoming an independent **country**; do not accept or prompt on "Pakistani independence" or "Indian independence" or "(the) partition of India"] <SE>

19. **A novel set just before and during one of these events begins with the pitbull China giving birth to a litter. The protagonist imagines herself as Medea and other mythological heroines in a 2011 novel set before one of these events. Army Specialist Nathan Levine works on the island of Creole after one of these events in the first published short story by Thomas Pynchon. The teenage girl Esch prepares for one of these events in Jesmyn Ward's (*)** *Salvage the Bones*. During one of these events, the protagonist of another novel grabs a piece of roofing and then is forced to hold onto a cow's tail. Near the end of *Their Eyes Were Watching God*, Tea Cake contracts rabies during one of these events. One of these events drives the protagonist into the title whirlpool of "A Descent Into the Maelstrom." For 10 points, name these tropical storms.
ANSWER: **hurricane**s [prompt on storms or cyclones; accept **tropical storm**s, **tropical cyclone**s, or **typhoon**s; prompt on floods by asking "What caused the flood?"] <JR>

20. **These structures are detected by the Bisous model or other algorithms developed for marked point processes. These structures occur where the Hessian of the density, or tidal field, has only one negative eigenvalue, in contrast to the "pancakes" predicted to fold into them under the Zeldovich approximation. A bright Lyman-alpha line from quasar U·M287 enabled the first-ever visualization of these structures in 2014. These structures** (*) *connect* the hot regions of the CMBR spectrum that result from the integrated Sachs-Wolfe effect. The Virgo Supercluster is found on one of these structures named for Pisces and Cetus, and the largest known object in the universe, the Hercules–Corona Borealis Great Wall, is one of these structures between halos. For 10 points, name these one-dimensional structures made of dark matter that lace across the cosmic web.
ANSWER: galactic **filament**s <AS>

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Packet 2 Bonuses

1. This composer's studies with Louis Andriessen helped inspire her to use Led Zeppelin-style riffs in pieces like *Lick*. For 10 points each:
[10] Name this composer who co-founded Bang on a Can with David Lang and Michael Gordon. She's also become known for works about labor history like *Steel Hammer* and *Anthracite Fields*.
ANSWER: Julia **Wolfe**
[10] Wolfe's piece *Four Marys* is inspired by music for *this* traditional string instrument, which plays alongside a banjo in *Steel Hammer*. This zither-like folk instrument confusingly shares its name with a "hammered" class of instruments.
ANSWER: Appalachian **dulcimer**s [or mountain **dulcimer**s or lap **dulcimer**s]
[10] Another of Wolfe's major musical influences is *this* highly repetitive style of music, whose exponents include Steve Reich and Terry Riley.
ANSWER: **minimal**ism <JR>

2. A giant sea creature called the *hafgufa* or "sea-mist" in an Icelandic saga is often associated with *this* legendary creature, and appears alongside an island-sized whale called the *lyngbakr*. For 10 points each:
[10] Name this huge sea monster from Nordic legend. The Lutheran bishop Erik Pontoppidan popularized the idea that this creature is mistaken for islands and is as deadly for leaving behind whirlpools as it is for its tentacles.
ANSWER: **Kraken** [prompt on answers like giant squids or colossal octopuses]
[10] The *hafgufa* appears in a saga named for *this* warrior, who also appears in the Tyrfing cycle. A prophecy that this man's horse would kill him comes true when he kicks the long-dead horse's skull and a snake comes out.
ANSWER: **Örvar-Odd**r [accept **Arrow-Odd**; accept translations semantically equivalent to **Arrow Point**]
[10] Örvar-Oddr also features in the *Hloðskviða*, which recounts a battle between the Goths and *these* people. A ruler of them who appears as "Etzel" in Germanic lore was said to wield a "Sword of God" found by a shepherd.
ANSWER: **Hun**s [or **Hun**nen] <JG>

3. In one poem, this dish is praised for its "honest, sonsie face," "hurdies like a distant hill," and dews "like amber bead." For 10 points each:
[10] Name this foodstuff hailed as a "great chieftain," whose "gushing entrails" are traditionally praised in a namesake "Address" while the host slices it open.
ANSWER: **haggis**
[10] "Address to a Haggis" is recited at celebrations of this poet's birthday, which are prominent cultural events in Scotland. This poet also wrote "A Red, Red Rose" and "To a Mouse."
ANSWER: Robert "Robbie" **Burns**
[10] Burns Nights often feature a performance of this other poem, which praises the dignity of the "honest man" who dines on "hamely fare." It ends with a prayer for all the men of the earth to become brothers.
ANSWER: "A **Man's a Man for a' That**" [or "**Is There for Honest Poverty**" or "**For a' That and a' That**"]
<DS>

4. Ceiling and floor functions in recurrence relations can be neglected using this technique, which gives an answer in terms of the integral, with respect to x, of the non-recurring function of x, divided by x to the p-plus-one. For 10 points each:

[10] Name this generalization of the master theorem used to solve recurrence relationships in which the subproblems may not be of equivalent size.

ANSWER: **Akra–Bazzi** method [or **Akra-Bazzi** algorithm]

[10] Just the standard master theorem is sufficient to prove *this* asymptotic behavior, in terms of N, of the recurrence relation: [read slowly] "T of N equals two-T, of N-over-two." Binary tree traversal has this runtime.

ANSWER: **N** [or big-O of **N**; or **linear** time]

[10] If the recurrence relationship also has a linear, nonrecurring N term, then the runtime is $N \log N$, as in *this* divide-and-conquer sorting algorithm developed by John von Neumann.

ANSWER: **merge**sort <AS>

5. This country's prime minister rejected a surrender ultimatum presented to him in October 1940 by Benito Mussolini, an event that its residents celebrate every year on "Ohi Day." For 10 points each:

[10] Name this country, in which a post-WWII civil war erupted between the government and the Communists after Axis forces pulled out of Athens.

ANSWER: **Greece** [or Kingdom of **Greece** or Vasileion tis **Ellados** or **Hellas**]

[10] The Axis occupation occurred under the second Greek king of *this* name. A grandfather-grandson pair with this name governed as prime ministers of Greece in the mid-'40s and mid-'60s, and then from 2009 to 2011.

ANSWER: **George** [or **Georgios**; accept **George** II or **George** Papandreou or **Georgios** Papandreou]

[10] Greek resistance groups included both Communists and liberal followers of an ideology named for *this* eight-term Greek prime minister. This nationalist hero frequently clashed with king Constantine over monarchical authority.

ANSWER: Eleftherios (Kyriakou) **Venizelos** <SE>

6. When Diego Rivera's *Man at the Crossroads* was removed from Rockefeller Plaza for its Marxist content, this man created the mural *American Progress* to replace it. For 10 points each:

[10] Name this Catalan painter of *Camacho's Wedding,* who created large murals for the Vic Cathedral and a dining room in New York City's Waldorf Astoria hotel. He shares a first and last name with a post-Gaudí Catalan architect.

ANSWER: Josep Maria **Sert** i Badia [or José María **Sert**] (The architect is Josep Lluis Sert.)

[10] Sert's murals are usually in shades of these *two* colors. An American painter depicted a "falling rocket" using these *two* title colors in 1875.

ANSWER: **black** AND **gold** [accept *Nocturne in **Black** and **Gold**: The Falling Rocket*]

[10] Sert associated *this* title concept with Asia in a set of thematic murals for a French château. Sandro Botticelli painted the Three Graces dancing in a forest in an allegorical depiction of this time period.

ANSWER: **spring** [or La **Primavera**] <MJ>

7. An epic from this island describes the "King of Heaven and Earth," who creates suns and moons for three "Rooster Emperors" and has twin sons who climb gourd vines to his throne to meet him. For 10 points each:
[10] Name this island, which those twins made governable by rendering non-humans mute with pine dust. People from this island claim to have emerged from three "clan holes" to found its Tamna [TAHM-nah] kingdom.
ANSWER: **Jeju**do (The epic is the *Cheonjiwang Bonpuri*.)
[10] In that epic, the King of Heaven and Earth subdues a beast king by putting an iron band on his head, like a monk does to *this* wielder of a self-lengthening iron staff in *Journey to the West*.
ANSWER: Sūn **Wùkōng** [or the **Monkey** King]
[10] Another epic from Jeju, the *Munjeon Bonpuri* [MOON-junn BOHN-poo-ree], gives a parallel to mainland origin stories for the *gashin* [GAH-sheen], who are Korean spirits of *this* general domain. The Slavic *domovoi* are spirits of this domain.
ANSWER: the **house**hold [or the **home**; anti-prompt on specific parts of a house like the hearth or on specific rooms] <JG>

8. These species were functionalized with thiol-labelled DNA strands to make the first spherical nucleic acids. For 10 points each:
[10] Name these species that appear red in solution but can aggregate to form a blue color due to plasmon resonances. They were first used as labels in electron microscopy but now are being used for therapeutics.
ANSWER: **gold nanoparticle**s [or **A·u·N·P**s; or **colloidal gold**; prompt on partial answer]
[10] Gold nanoparticles are synthesized from chloro·auric acid by this type of reaction catalyzed by citric acid or sodium boro·hydride. In organic chemistry, this type of reaction involves adding hydrogen or removing oxygen.
ANSWER: **reduction** [prompt on redox reaction or reduction-oxidation]
[10] A greener alternative for synthesizing gold nanoparticles uses this common biological reductant, which is often applied instead of bisulfite in classroom demonstrations of the iodine clock reaction. This compound is a substituted five-membered unsaturated lactone derived from glucose.
ANSWER: **ascorbic acid** [or **Vitamin C**] <AS>

9. The heteronormativity of this novel, which describes a social ethos called *shifgrethor*, was acknowledged in its author's essay "Is Gender Necessary? Redux." For 10 points each:
[10] Name this *Hainish Cycle* novel in which the Terran ethnologist Genly Ai becomes embroiled in the politics of the planet Gethen, whose "ambisexual" inhabitants only take on sexual and gendered characteristics during *kemmer*.
ANSWER: The ***Left Hand of Darkness**
[10] This author of the *Earthsea* series, who died in January 2018, wrote *The Left Hand of Darkness*. She used science fiction to imagine social possibilities in works like *The Dispossessed* and *Rocannon's World*.
ANSWER: Ursula K(roeber) **Le Guin**
[10] This author of feminist science fiction like *The Female Man* and *We Who Are About To…* was an admiring critic of *The Left Hand of Darkness*. She also wrote the satirical guide *How to Suppress Women's Writing*.
ANSWER: Joanna **Russ** <JG>

10. This company paid $75 million to settle a seven billion-dollar lawsuit brought by Nigerian plaintiffs in the case *Abdullahi v. [this company]*. For 10 points each:
[10] Name this American company whose actions caused the deaths of eleven children in Kano province in 1996. It then attempted to blackmail Nigeria's attorney general to drop the case.
ANSWER: **Pfizer** Inc.
[10] The settlement for the deaths in Pfizer's Trovan clinical trial was brokered by Jimmy Carter and *this* former Nigerian leader. He ruled the country between 1966 and 1975 and put down the Biafran secession.
ANSWER: Yakubu "Jack" (Dan-Yumma) **Gowon**
[10] The mistrust caused by Pfizer's actions also impeded the effort to eliminate *this* disease in Kano state. By 2018 only 33 wild cases of this paralysis-causing disease were reported, all of them in Afghanistan and Pakistan.
ANSWER: **polio**myelitis <DS>

11. In 2D, these theories can be solved using bootstrap approaches that are generated using a Virasoro algebra. For 10 points each:
[10] Name this class of field theories that generally maintain scale-invariance. Juan Maldacena postulated that they correspond one-to-one with anti de Sitter spaces.
ANSWER: **conformal** field theories
[10] In any conformal field theory, this quantity is traceless. In any field theory, this quantity is proportional to the derivative of the Lagrangian with respect to the metric.
ANSWER: Hilbert **stress–energy** tensor [or **energy–momentum** tensor; or **T**; do not accept or prompt on partial answers]
[10] Conformal field theories in higher dimensions include the 4D Yang–Mills theory, which corresponds with one of these theories of quantum gravity. These theories enable gravity through their namesake 1D vibrating objects.
ANSWER: super**string** theories [or **M** theory] <AS>

12. Tom Wolfe's *From Bauhaus to Our House* relates how this university's architecture students had an inside joke about its eponymous "Box," a featureless design they would depict "in the desert" or "in the city" on bulletin boards. For 10 points each:
[10] Name this university whose architecture school was long led by Paul Rudolph. Cesar Pelli was also a dean at this school, where Eero Saarinen finished his studies.
ANSWER: **Yale** University
[10] This Chinese-American designer of the *Women's Table* fountain won the competition to design the Vietnam War Memorial while she was still an architecture undergraduate at Yale.
ANSWER: Maya (Ying) **Lin**
[10] This architect taught at Yale before returning in 2018 to SCI-Arc, the California architecture school he helped found in the 70s. This Pritzker winner designed the New Academic Building at Cooper Union, the Caltrans District 7 HQ, and Diamond Ranch High School through his firm Morphosis Architects.
ANSWER: Thom **Mayne** <JM>

13. In a poster asking "Is [this state] in America?", Big Bill Haywood depicted an incident in which the striker Harry Maki was tied to a telephone pole. For 10 points each:
[10] Name this state that saw namesake "Labor Wars" in 1903, and several miners' strikes at Cripple Creek. The Baldwin–Felts agency terrorized a later strike in this state with an armored car called the "Death Special."
ANSWER: **Colorado**
[10] Big Bill Haywood would later co-found *this* radical union with Mother Jones. It advocated "one big union," spearheaded the Lawrence Textile Strike, and was frequently targeted by the Espionage Act.
ANSWER: **IWW** [or **Industrial Workers of the World**; accept **Wobblie**s]
[10] During the Colorado Labor Wars, Haywood worked for *this* union led by Charles Moyer. This organizer of the Michigan Copper Country strikes collapsed in the 1914 Butte Labor Riots, with many of its members joining the IWW.
ANSWER: **WFM** [or **Western Federation of Miners**] <JG>

14. In this novel, a Moroccan woman named Wafa takes care of the child Alphonse, whom she imagines growing up and hiring a prostitute in the seedy Casablanca motel where she herself used to give massages. For 10 points each:
[10] Name this 2016 novel by French-Moroccan writer Leïla Slimani, which begins "The baby is dead." In it, the professional couple Paul and Myriam hire Louise to take care of their children.
ANSWER: The ***Perfect Nanny*** [or ***Chanson douce**; accept **Lullaby**]
[10] In the novel *Submission*, *this* author depicted the election of charismatic Muslim Brotherhood candidate Mohammed Ben Abbes to the French presidency from the perspective of the apathetic literature professor François. He also wrote *The Elementary Particles*.
ANSWER: Michel **Houellebecq** [well-BECK]
[10] Algerian writer Kamel Daoud's novel *The Meursault Investigation* is written from the perspective of Harun, the brother of the Arab shot by the protagonist of *this* Albert Camus novel.
ANSWER: The ***Stranger*** [or *L'**Étranger**; or *The **Outsider**] <SK>

15. Microeconomics textbooks often cheerfully admit that they have no intuition for why this matrix should be negative semidefinite—but it is. For 10 points each:
[10] Name this matrix whose entries are price derivatives of Hicksian demand function.
ANSWER: **Slutsky** matrix [or **substitution** matrix]
[10] Fill in the blanks labelled **A** and **B** in the following statement: [read slowly] "Hicksian demand is the solution to a consumer minimizing **A**, subject to **B**."
ANSWER: **(A) expenditure** [accept equivalents like **spend**ing]
       (B) a minimum level of **utility** [accept in either order, but it should be clear which is *A* and which is *B*]
[10] The Slutsky equation decomposes a price change into the substitution effect and this other effect. Graphically, this effect can be illustrated as moving the budget constraint up or down without changing the slope.
ANSWER: **income** effect [or **wealth** effect] <SB>

16. This work attacks positions it dubs "ersatzist" in the chapter "Paradise on the Cheap?" For 10 points each:
[10] Name this modal realist work, which argues that the title entities exist in the ordinary language sense, are causally isolated from each other, and can thus each be properly considered "actual" relative to the people in them.
ANSWER: _**On the Plurality of Worlds**_ (by David Lewis)
[10] In _On the Plurality of Worlds_, David Lewis also advances counterpart theory as an alternative to the modal semantics developed by _this_ philosopher. This philosopher argued that names are "rigid designators" in _Naming and Necessity_.
ANSWER: Saul (Aaron) **Kripke**
[10] _On the Plurality of Worlds_ also introduced these _two_ terms for positions in philosophy of identity. One holds objects to be wholly present at any time, and the other that objects are "extended" across temporal parts. Give _either_.
ANSWER: **endurantism** OR **perdurantism** [accept word forms of either and of the words **endure** and **perdure**; prompt on three-dimensionalism or four-dimensionalism; anti-prompt on more specific types of perdurantism like stage theory, space-time worm theory, or exdurantism and word forms] <JG>

17. This thinker argued that, since Christ advocated paying taxes to Rome and mistreated his mother, he objectively committed sins, even though he more significantly can be said not to be sinful. For 10 points each:
[10] Name this theologian who put forth a novel theodicy in the books _Christ and Horrors_ and _Horrendous Evils and the Goodness of God_, both from the early 2000s.
ANSWER: Marilyn McCord **Adams**
[10] Adams was a priest in _this_ American subset of the Anglican Communion, which was the first to ordain women and LGBT people.
ANSWER: **Episcopal** Church [or **Episcopal**ians]
[10] On the other hand, the largest denomination of _this_ offshoot of the Anglican lineage recently agreed _not_ to allow the ordination of LGBT people. This denomination holds that God's grace gives rise to an "imparted righteousness" at birth and allows us to live a life of "perfect love."
ANSWER: **Methodism** [accept (United) **Methodist** Church] <JM>

18. These punctuation marks are used repeatedly to create a feeling of claustrophobia in Amiri Baraka's poem "An Agony. As Now." For 10 points each:
[10] Name these punctuation marks used to intertwine the words "rearrangingly" and "become" at the end of another poem.
ANSWER: **parentheses** (The mentioned poem is cummings's "r-p-o-p-h-e-s-s-a-g-r.")
[10] David Jones's epic poem _In Parenthesis_ incorporates Welsh mythology into the story of soldier John Ball's service in _this_ war. e.e. cummings's novel _The Enormous Room_ is set during this war.
ANSWER: **World War One** [or The **Great War** or **WWI**]
[10] This author's essays and newspaper columns were assembled into the book _Between Parentheses_. His poetry collections include _The Romantic Dogs_, and he helped found a poetic movement called "infrarealism."
ANSWER: Roberto **Bolaño** (Avalos) <DS>

19. The species of *Clostridia* that causes this infection produces a toxin whose L·D·50 is lower than all known substances except botulism toxin. For 10 points each:
[10] Name this bacterial infection also called lockjaw. A vaccine against it is given in combination with diphtheria and pertussis.
ANSWER: **tetanus**
[10] Tetanus toxin works by cleaving this vesicle-associated membrane protein, a SNARE that buds off onto vesicles as they form and is transferred across neuronal synapses.
ANSWER: **synaptobrevin**
[10] Continuous muscle activation also occurs from exposure to organo·phosphates, which are competitive inhibitors of this enzyme found at neuro·musculatory junctions.
ANSWER: **acetylcholinesterase** [or **Ach**; or **AChE**; or **acetylhydrolase**] <AS>

20. Answer the following questions about the so-called "Athenian Empire," for 10 points each:
[10] The "Athenian Empire" mainly grew out of the possessions of a "League" centered on *this* Aegean island. The 454 B.C. transfer of the League's treasury from this island to Athens symbolized Athens' growing imperialism.
ANSWER: **Delos** [accept **Delian** League]
[10] Another result of growing Athenian imperialism was the 465 B.C. siege of *this* island, which had sought to renounce membership in the Delian League. Following its defeat, this island was deprived of access to its silver deposits on the Thracian mainland.
ANSWER: **Thasos**
[10] Despite its neutrality, Athens demanded that *this* island join the Delian League in 416 B.C. The Athenian envoys reportedly told this island's inhabitants that "the strong do what they can and the weak suffer what they must."
ANSWER: **Melos** [accept **Melian** Dialogue] <MK>