Fall Open 2019
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Tossups

1. **This gas is removed from groundwater by using glauconite coated with manganese oxide in either the intermittent regeneration or continuous regeneration processes. This gas is removed by a bioreactor operating at ambient temperature and pressure in the Shell-Paques process. DEA ("D-E-A"), MEA ("M-E-A"), and MDEA ("M-D-E-A") are used to remove carbon dioxide and this gas. HDS hydrotreating units often use cobalt-molybdenum catalysts to produce this gas via hydrogenolysis ("hydrogen-oh-lysis"). After being stripped in amine ("AY-meen") scrubbing, this acid gas is then used as a fuel in the combustion reaction that begins the (*)** Claus process. Natural gas with high levels of this gas is called sour gas. This byproduct of crude oil refinement is combusted in the first step of the wet sulfuric acid process. This chalcogen-containing gas is produced in anaerobic ("ANN-ay-RO-bic") respiration. For 10 points, what poisonous gas that smells like rotten eggs is produced by sulfate-reducing bacteria?
ANSWER: **hydrogen sulfide** [or **H2S**; accept **dihydrogen monosulfide** or **dihydrogen sulfide**; accept **sulfur hydride**; accept **hydrosulfuric acid**; prompt on sewer gas]
<JS, Chemistry>

2. **An essay on this concept describes how the ancient Egyptians would have a person dress up as this concept and berate people at feasts. Lucretius originated a "symmetry argument" about this concept that is attacked in a Thomas Nagel essay for treating the past and future equivalently. Linguistic ambiguity means that this concept "ends in Being," according to an essay on "Literature and the Right to" this concept by Maurice Blanchot. A book titled for this concept grew from a very popular (*)** Yale MOOC ("mook") taught by Shelly Kagan. An essay by Michel de Montaigne ("mee-SHEL duh mon-TAN") argues "That to Study Philosophy is to Learn to" experience this concept. The *Letter to Menoecius* argues that "when [this concept] exists, we do not," so its author Epicurus thus concluded that this concept "is nothing to us" despite believing that it causes the soul to scatter into the wind. For 10 points, name this concept often defined in bioethics as "irreversible loss of brain function."
ANSWER: **Death** [accept synonyms; accept answers describing the question of **whether or not death is actually bad**] (the first clue is from the Montaigne essay mentioned)
<JG, Philosophy>

3. **A monograph which "magisterially captures the essence" of this artist takes twenty years for the art historian-slash-spy Victor Maskell to complete in John Banville's novel *The Untouchable.* In another novel, the thought of centaurs and other "shapes from a fabulous past" brings a painting by this artist to the narrator's mind. This artist's lover Gillette models for an aging painter's "masterpiece" depicting the courtesan Catherine Lescault ("less-CO") as a "bare foot" protruding from a "chaos of color." With Francois Porbus, this artist witnesses Frenhofer's madness in (*)** Honoré de Balzac's story "The Unknown Masterpiece." The "sight of snow descending on fire" reminds Nick Jenkins of a painting by this artist at the start of *A Question of Upbringing,* the first novel of a series which includes the sinister man Kenneth Widmerpool. For 10 points, name this French painter who inspired the title of Anthony Powell's twelve-novel cycle *A Dance to the Music of Time.*
ANSWER: Nicholas **Poussin** ("poo-SAN")
<INB, Miscellaneous Lit>

4. **As a teenager, Johann Nepomuk Hummel spent a year in this city studying under Muzio Clementi, whose publishing firm in this city held a monopoly on Beethoven's music. After moving to this city in 1759, Carl Friedrich Abel co-organized a series of concerts headlined by Ignaz Pleyel. It was in this city that the eight-**

year-old Wolfgang Amadeus Mozart composed his first symphony, as part of an eleven-month stay during his family's musical tour across Europe. This city was where Johann (*) Christian Bach, the eighteenth of J. S. Bach's twenty children, spent his professional career. Before he died by falling off of his horse, the impresario Johann Peter Salomon organized his own concert series in this city, bringing superstar composer Joseph Haydn to compose and conduct his final twelve symphonies. For 10 points, name this capital city where the court composer George Frideric Handel was naturalized by a 1727 Act of Parliament.

ANSWER: **London**
<KL, Classical Music and Opera>

Note to players: description acceptable.

5. **Legendarily, the time between two instances of this sound was used to settle the border between Florence and Siena. The Zoroastrian demon Bushyasta ("boo-SHASS-tah") is vanquished when this noise is produced by an aspect of the *yazata* Sraosha ("s'RO-shah"). This is *not* the sound of blowing a horn, but in the *Völuspá*, this loudness interrupts the cheerful harp music of the *jötunn* ("YO-tun") Eggthér. In Greek mythology, a wee lad is cursed to make this sound forever when his incompetence allows Helios to discover the affair of Ares and Aphrodite. (*)** Gullinkambi, Fjalar ("f'YAH-lar"), and an unnamed third character each perform this sound to alert their listeners to the beginning of Ragnarök. The Roman practice of alectryomancy ("alectry-omancy") included divination using this sound, which occurred during the *gallicinium* and was fatal to the basilisk. In the gospels, Jesus prophesies that this sound will coincide with the denial of Peter. For 10 points, give this call made by poultry at dawn.

ANSWER: the **crow of a rooster** [or **cock-a-doodle-doo**; or ***chicchirichì***; or ***gaggalagú***; or ***cococo***; or ***koukouríkou***; or obvious equivalents; prompt on partial answer; do NOT accept "bok bok" or "cluck cluck" or "coo coo"]
<KL, Mythology>

6. **H. Marshall Leicester interpreted this character's story as a reversal of *The Arabian Nights* in his book *The Disenchanted Self.* This character's "doom-eagerness" is addressed in Harold Bloom's *The Western Canon,* in which he's the second character considered in a chapter titled for his creator "and Shakespearean Character." This character momentarily confuses Lamuel with Samuel as he condemns "the worst vice," drunkenness. This character's possessions include a sheep's shoulder bone that he suggests the (*)** Host kiss, who responds by threatening to cut off this character's testicles. This character tells of a scoundrel who visits a tavern to buy bread and wine, then stops by the apothecary to purchase rat poison. In this man's story, a group of "friends" stumble across an oak tree at whose base rests a pile of gold coins. For 10 points, three sinners set off to kill Death in which pilgrim's story from *The Canterbury Tales?*

ANSWER: The **Pardoner**
<INB, Short Fiction>

7. **A pooling and rebate arrangement known as the "evener system" was developed in this industry, which was investigated by the Vest Committee. A chapter titled "Annihilating Space" examines this industry in William Cronon's book *Nature's Metropolis*. This industry's growth in the Menomonee River Valley included one of its Big Four companies, which was owned by Patrick Cudahy. The phrase "the real McCoy" possibly refers to Joseph McCoy, the founder of a town that supported this industry. Gustavus (*)** Swift and Philip Armour were competitors in this industry, which rapidly grew after the development of the refrigerated railroad car. Until the 1950s, this industry operated the Union Stock Yards district. An author quipped "I aimed at the public's heart, and by accident I hit it in the stomach" about a novel exposing this industry, which partly led to the Pure Food and Drug Act. For 10 points, name this industry exposed by Upton Sinclair in his novel *The Jungle*.

ANSWER: **meatpacking** industry [or **meat** industry; or **beef** industry; or **pork** industry; prompt on cattle industry]
<AK, US History>

8. **An avant-garde version of this song with a prominent Eric Dolphy solo is the last track on the George Russell Sextet's 1961 album *Ezz-thetics*. This song is the first track on Bill Evans's album *Conversations with Myself*. Herbie Hancock scored a film of this title, which controversially won the 1986 Academy Award for Best Original Score. This song's introduction comes from Dizzy Gillespie's practice of playing it back-to-back with "I Can't Get Started." It begins with the four ascending notes "B-flat, E-flat, F, B-flat," followed by a long G-flat. The first (*)** Miles Davis album released by Columbia Records is titled for this song, with the insertion of the word "About." This is the most-recorded jazz standard to be composed by a jazz musician, and it is the first track on its composer's compilation album *Genius of Modern Music: Volume 1*. For 10 points, name this jazz standard by Thelonious Monk which, roughly speaking, is in the vicinity of 12:00 am.
ANSWER: "**'Round Midnight**" [accept "**'Round About Midnight**"]
<KL, Jazz>

9. **An "Orwellian double speak" at one of these facilities at Rugeley in the UK was described by the undercover reporter James Bloodworth. In a memoir about these facilities that switches between first and second-person, the narrator struggles to work with Hans-Peter; that memoir was written by Heike Geissler. Temporary hiring for these facilities is partly taken care of by Integrity Staffing Solutions. In 2018, a leaked animated training video for workers in these facilities described a company's position as "not (*)** anti-union, but not neutral either." The largely Somali workforce of one of these facilities called MSP1 in Shakopee, Minnesota participated in a walk-out on July 15th. Last November, workers at these facilities began receiving a fifteen-dollar minimum wage, partly due to pressure from a Bernie Sanders bill named after their CEO. For 10 points, name these facilities that were the site of several strikes on Prime Day 2019.
ANSWER: **Amazon warehouse**s [or **Amazon fulfillment** centers; prompt on Amazon workplaces or similar descriptions; do NOT accept or prompt on "Amazon headquarters", "Amazon software development centers", "Amazon customer service centers", or "Amazon retail"]
<AK, Current Events>

10. **A response to this thought experiment declares that its original conclusion is not justified because it relies upon a criterion that does not disambiguate between a "mechanical disturbance" and an "influence." A team at the Institut d'Optique reproduced this thought experiment with a two-channel polarizer scheme that used a J = 0 to J = 1 to J = 0 cascade decay in calcium-40 as a source. The dissociation of a diatomic molecule whose total spin angular momentum remains zero was put forth by Bohm as a means to test this thought experiment. The fact that every element of physical reality does not have a (*)** counterpart in a certain physical theory was proven using this thought experiment. This thought experiment was used in its original paper to show that the wave function is not a complete description of reality. For 10 points, name this entanglement paradox that is commonly referred to by the initials of the three physicists who proposed it.
ANSWER: **EPR** thought experiment [or **Einstein-Podolsky-Rosen** thought experiment; accept **EPR** paradox] (The response is by Bohr and has the same title as the original EPR paper; the criterion is EPR's criterion for what constitutes physical reality)
<JS, Physics>

11. **An essay on this event highlights a photo in *The Sun* of a vicar pointing a shotgun at his son. That essay by Leo Bersani uses a mob burning a house in Arcadia, Florida to describe this event's "malignant moralistic aversion." Edward Hooper's book *The River* randomly linked Hilary Kaprowski's anti-polio efforts to this event. Tom Keane infiltrated St. Patrick's Cathedral and shut down communion in the "Stop the Church" protest during this event. "Dr. Beetroot" based responses to this event on Peter (*)** Duesberg's discredited theories. Some theories of this event's origin focus on Arvid Noe or on Air Canada employee Gaëtan Dugas ("gah-ay-TAHN d'yoo-GAH"). Jesse Helms's house was placed in a giant condom by groups protesting this event like the Silence=Death ("silence-equals-death") Project and ACT UP ("act up"). This event is chronicled in *And the Band*

Played On. Thabo Mbeki's ("TAH-bo um-BECKY") denialism worsened this event in South Africa. For 10 points, name this event caused by zoonosis of simian viruses into HIV.
ANSWER: the **AIDS** epidemic/crisis [accept **HIV** until mentioned; accept any answer that mentions the disease's names or gives the full names thereof] (The title of Bersani's essay is "Is the Rectum a Grave?")
<JG, European History (Commonwealth, Ancient, Historiography)>

12. **For part of this festival, people often make a model of a mountain from cow dung and give food offerings to match that part's name, which literally means "Mountain of Food." The Nirvan Ladoo offering is given during this festival, which includes Annakut. On "Tihar" during this festival, crows, cows, and, most famously**, **dogs are venerated in Nepal. This festival's first day celebrates Yama's distraction by a mound of treasure a crafty princess used to save King** (*) Hima, and that first day of this festival is often dedicated to Dhanvantari ("dun-vun-TAR-ee"). Sikhs celebrate Bandi Chhor Divas during this festival, which ends with Bhai Dooj and includes the Lakshmi Puja.This is the festival most closely associated with colored rice or chalk patterns called *rangoli*. India is trying to promote "green fireworks" to reduce pollution on this holiday, which includes the use of many *diya*s, a type of oil lamp. For 10 points, name this Indian "festival of lights."
ANSWER: **Diwali** [accept **Deepawali** or any answer that pronounces those w's like a "v"; accep **Swanti**, or **Yamapanchak**; accept **Bandi Chhor Divas** or **Tihar** until mentioned; anti-prompt on any of the specific days or events, including but not limited to Dhanteras, Naraka Chaturdashi, Balipratipada, Annakut, or Govardhan Puja; prompt on Lakshmi Puja or Bhai Dooj until mentioned]
<JG, Religion>

13. **In this country, the Forty Conspirators defenestrated an unpopular secretary of state and kidnapped the king's cousin Margaret of Savoy, Duchess of Mantua. A claimant to this country's throne delivered its crown jewels to Catherine de Medici, who repaid him with a large French fleet that lost the Battle of Ponta Delgada. Frederick Schomberg commanded an English brigade in this country, where the Prior of Crato's efforts to preserve a dynasty were ended at the Battle of** (*) Alcântara ("al-CAHN-tah-rah"). John IV ("the-fourth") began this country's longest-lasting dynasty after a 24-year "Restoration War" against its eastern neighbor. During a dynastic union, this country temporarily lost many of its overseas possessions to the Dutch, including Elmina Castle, Pernambuco, and Bahia. A larger neighbor began its 60-year rule over this country after its king Sebastian I died at Ksar-el-Kebir to Moroccan forces. For 10 points, the Iberian Union began when Spain's Philip II assumed the throne of what neighboring country?
ANSWER: **Portugal** [or Kingdom of **Portugal** and the Algarves]
<KS, European History (Continental)>

14. **An article about this institution quotes studies by Ivan Charper and Bryan Fraser to question the utility of learning how to "operate" a simple machine and sees blind obedience as harmful to teenagers. This institution titles an article cautioning against the proliferation of e-learning platforms written by Noel Carroll. Amitai Etzioni wrote about the ill effects of this institution that one thinker used as emblematic of the "nothing" when comparing it to locales that are "something."** (*) Calculability, predictability, and control are the hallmarks of this institution according to a 1993 book. A theory regarding this institution was made famous by Thomas Friedman's *The Lexus and The Olive Tree* which stated that nations containing them did not go to war with each other. This organization represents the rationalization of modern society in a book by George Ritzer. For 10 points, name this efficient fast-food chain, the subject of the "Golden Arches Peace Theory."
ANSWER: **McDonald's** [accept equivalents]
<JM, Sociology>

15. **On a Riemannian manifold, this quantity is equal to a difference of second covariant derivatives taken in opposite orders. If a knot has a value of less than four-pi for this quantity, then it is the unknot ("UN-not"). Of all the surfaces with a fixed boundary, the one with minimal area is the one with a value of zero for this**

quantity. Since the Christoffel symbols of a surface can be written in terms of the first fundamental form and its derivatives, this quantity is uniquely determined by the first fundamental form. This quantity is invariant under local isometries according to the (*) theorema egregium. The derivative of the unit tangent vector with respect to arclength is equal to this quantity times the unit normal vector, according to the Frenet-Serret ("fruh-NAY-ser-RAY") formulas. The value of this quantity for a circle of radius r is "one over r," while a straight line has a value of zero for this quantity. For 10 points, name this quantity that measures how far an object deviates from being straight.
ANSWER: **curvature** [accept total absolute **curvature**; accept mean **curvature**; accept principal **curvature**; accept Gaussian **curvature**]
<SK, Math>

16. **Shortly before he died, a poet from this country described his life "from birthing's washbowl / to the washbowl of the dead" as "blathering nonsense." A writer from this country credited his interest in poetry to the "windblown" spirit contained within his "hundred bones and nine holes." In his book *The Spring of My Life,* a poet from this country bitterly reflected on his infant daughter's death from smallpox with the lines "This world of** (*) dew / is only the world of dew / and yet… and yet." Sam Hamill's translation of a travelogue from this country opens, "The moon and sun are eternal travelers. Even the years wander on." A poet from this country included his own commentary alongside thirty pairs of various writers' poems in the anthology *The Seashell Game* and took his pen-name from the banana tree growing outside of his hut. For 10 points, name this country home to the poet Bashō ("BAH-sho").
ANSWER: **Japan** [or **Nippon**; or **Nihon**]
<INB, Non-epic Poetry>

17. **Albert Wolff reviewed an exhibition of this movement by singling out one artist among a group of "five or six lunatics." An artist from this movement was known for depicting the Muses using *faience* ("fay-AHNS") tiles and a dimly lit dinner scene in the painting *Under the Lamp*. A painting by an artist from this movement was analyzed in terms of the "construction of work and leisure" by Linda Nochlin. An artist from this movement adopted a flatly-shaded drypoint and aquatint style for** (*) *The Coiffure* ("kwah-f'YOOR"), which adapted woodblock prints by Kitagawa Utamaro. That artist from this movement painted several portraits from loges in the Paris Opera House. Marie Bracquemond was among three artists from this movement who were collectively referred to as "les trois grandes dames" ("leh twah grahn-duh dahm"). Domestic scenes painted by the other two artists from this movement include *The Cradle* and *The Child's Bath*. For 10 points, name this 19th century artistic movement that included Berthe Morisot ("mo-ree-SO") and Mary Cassatt.
ANSWER: **Impressionism**
<AK, Painting and Sculpture>

18. **A position supposedly opened for the founder of this dynasty when a ruler found a mysterious wooden plaque with a hexagram on it. The founder of this dynasty died in an incident known as "the shadow of the candle and the sound of the ax." The impact of the transition *to* this dynasty is the subject of the Naito Hypothesis. Much of this dynasty's grand strategy centered on the so-called "Great Ditch." This dynasty's founder interrupted the scholar Fan Zhi's dinner in tears to announce his coup.** (*) Bi Sheng worked under this dynasty, which switched lines of succession due to the Jingkang Incident. This dynasty's founder claimed his soldiers forced him to declare himself emperor after waking him from a drunken snooze. The overthrow of the Later Zhou ("jo") by this dynasty ended the Five Dynasties and Ten Kingdoms period. For 10 points, name this dynasty founded by Zhao Kuangyin ("kwang-yeen"), which repeatedly fought the Jin dynasty until Mongols conquered both of them.
ANSWER: **Song** Dynasty [accept **Zhao** until "Zhao Guangyin" is read]
<JG, Other History>

19. **A form of this condition that is difficult to diagnose develops near the intersection of the semilunar line with the arcuate line. In addition to its use in the diagnosis of abnormalities in the heart and spine, the Valsalva maneuver can be used to detect this condition. This condition is called incarcerated if it cannot be reduced. This most common complication of a laparotomy ("lap-uh-rotomy") is classified into types including umbilical and inguinal ("ING-gwin-al"). When this condition occurs at the (*)** hiatus, it can cause heartburn and acid reflux because the diaphragm no longer exerts pressure on the lower esophageal sphincter. Loss of fascial integrity leads to this condition whose indirect form is characterized by the presence of the peritoneal sac. Diagnosis of this condition is done by palpating the affected area and detecting bulges when the patient coughs. A tissue or organ protrudes through the wall of its cavity in this condition. For 10 points, name this condition that occurs when spinal disks bulge through the annulus.
ANSWER: **hernia** [or abdominal **hernia**; accept **hernia**ted disk; ; do NOT accept "sports hernia"; accept other types of hernia, including: inguinal **hernia**; femoral **hernia**; umbilical **hernia**; incisional **hernia**; epigastric **hernia**; hiatal **hernia**; diaphragmatic **hernia**; Spigelian **hernia**] (The first clue is referring to Spigelian hernia)
<JS, Biology>

20. **This author created a character who is last seen rummaging through garbage, prompting the narrator to describe her as both "the waste and beauty of the world." A novel by this author ends as its main character first crawls, then runs into the forest to join a band of blind, naked horsemen. This author wrote about the wealthy Valerian, who retires to his greenhouse after learning that his wife Margaret beat their son, in a novel that opens on the (*)** Caribbean Isle des Chevaliers ("eel day sheh-vah-l'YAY"). That novel by this author hinges on the relationship between the stowaway Son and the Sorbonne ("sor-bun")-educated Jadine Childs. The unfortunate protagonist of another novel by this author is manipulated by Soaphead Church, abused by the town of Lorain, and raped by her father Cholly. For 10 points, what author of *Tar Baby* wrote about Pecola Breedlove's obsession with the title physical characteristic in *The Bluest Eye*?
ANSWER: Toni **Morrison** [or Chloe Anthony **Wofford**; or Chloe Ardelia **Wofford**]
<INB, Long Fiction>

Bonuses

1. This contributor to the magazine *Tel Quel* examined how a Russian literary theorist split with the earlier Formalists to view dialogue as "the only sphere possible for the life of language." For 10 points each:
[10] Identify this critic who helped introduce Mikhail Bakhtin to the West with the essay "Word, Dialogue and Novel."
ANSWER: Julia **Kristeva**
[10] Kristeva warned against viewing this concept as mere parody while ignoring its more "dramatic" aspects. Bakhtin explained this concept as an ambivalence towards, and subversion of, the dominant atmosphere.
ANSWER: the **carnival**esque
[10] Bakhtin fleshed out his theory of the carnivalesque in a book titled for this author *and his World.* He detailed the scatological exploits of a pair of giants in his novel series *Gargantua and Pantagruel.*
ANSWER: François **Rabelais** ("rab-uh-LAY")
<INB, Miscellaneous Lit>

2. An 1872 painting depicts the Biglin brothers dressed in silk blue bandanas as they engage in this activity. For 10 points each:
[10] Identify this subject of some two dozen paintings by an American artist, including one in which a man dressed in a sleeveless white shirt engages in it with an object labeled *Josie.*
ANSWER: scull **rowing** [or **boat racing**; prompt on racing]
[10] This artist depicted both himself and his friend in racing boats in his painting *Max Schmitt in a Single Scull.* This Philadelphia-based artist painted a doctor lecturing to Jefferson Medical College students in his *The Gross Clinic.*
ANSWER: Thomas **Eakins** [or Thomas Cowperthwait **Eakins**]
[10] In an 1877 painting, Eakins depicted the sculptor William Rush allegorizing this natural feature through his statue of a nymph. Eakins's *Max Schmitt in a Single Scull* depicts the rower on this geographical feature.
ANSWER: **Schuylkill** ("skool-kill") River
<INB, Painting and Sculpture>

3. This man played Joe Keller in the 2019 Broadway production of Arthur Miller's *All My Sons.* For 10 points each:
[10] Identify this man who appeared as George, opposite Amy Morton's Martha, in an acclaimed 2010 Steppenwolf Theatre production of *Who's Afraid of Virginia Woolf.*
ANSWER: Tracy **Letts** [or Tracy S. **Letts**]
[10] As a playwright, Letts wrote about the dysfunctional Weston family's untimely reunion in this Oklahoma-set play.
ANSWER: *August: Osage County*
[10] In a 2016 play, Letts cycled through various points in the life of an Ohio accountant with this surname. An earlier playwright with this surname wrote about the murderous merchant Barabas in *The Jew of Malta*.
ANSWER: **Marlowe** [accept *Mary Page **Marlowe*** or Christopher **Marlowe**]
<INB, Drama>

4. For 10 points each, answer some questions about ensuring the availability of services like ISPs ("I-S-P's") or telephone service providers.
[10] ISPs commit to redundancy, throughput, response time, and other requirements in these contracts. These contracts commonly referred to by a three letter acronym quantify availability by the number of nines.
ANSWER: **service level agreement** [or **SLA**]
[10] The mean time to or between these events is a common metric used in service level agreements. Faults lead to these events whose modes are analyzed in FMEA, and the rate of these events is given by the bathtub curve.
ANSWER: **failure**s [accept mean time between **failure**s; accept mean time to **failure**; prompt on MTBF or MTTF]

[10] Failure analysis commonly assumes that system failure follows an exponential distribution, which models the time between events in processes named for this man. Server arrivals are modeled with a distribution named for this French mathematician whose mean and variance both equal the rate parameter lambda.
ANSWER: Siméon Denis **Poisson** ("see-may-ON duh-NEE pwah-SON")
<AK, Computer Science>

5. A squirrel named for this region evolved from the similar Abert's squirrel due to an isolated region of ponderosa pines during the Ice Age. For 10 points each:
[10] Name this region where the U.S. Forest Service killed off thousands of coyotes and mountain lions who preyed on its population of mule deer. The decision backfired when the deer began to starve after quickly exhausting this region's plant supply.
ANSWER: **Kaibab** Plateau
[10] The Kaibab Plateau includes the North Rim of this natural feature in Arizona, whose ecosystem has been adversely affected by uranium mining and the construction of the Glen Canyon Dam.
ANSWER: **Grand Canyon**
[10] The cautionary tale of the Kaibab deer was popularized by this naturalist, who advocated for a new "land ethic" in a book that describes the area around his home in Baraboo, Wisconsin.
ANSWER: Aldo **Leopold** (The book is *A Sand County Almanac*.)
<KS, Geography>

6. Answer the following questions about the Thomson dipole, for 10 points each.
[10] This quantity for a Thomson dipole is remarkably independent of the distance between poles. This quantity can be imparted on a light beam by passing it through a forked hologram, a spiral phase plate, or a q-plate.
ANSWER: **angular momentum** [accept orbital **angular momentum**; do NOT accept or prompt on "linear momentum" or "momentum"]
[10] A Thomson dipole consists of an electric point charge and one of these hypothetical particles. Dirac proved that the quantization of electric charge is implied by these particles that would be sources and sinks of the **B** field.
ANSWER: **magnetic monopole**s ("MONO-poles")
[10] This physicist and Harold Wilson independently gave a semi-classical derivation of the Dirac quantization condition based on the Thomson dipole. This Indian physicist lends his name to an equation for the ratio of the number of ions in ionization state "*i*-plus-one" to the number of ions in ionization state *i*.
ANSWER: Meghnad **Saha** [accept **Saha** ionization equation]
<JS, Physics>

7. Like Suakin ("s'WAH-kin") to its north, this city grew in importance as one of the main ports of the Ottoman *eyalet* of Habesh. For 10 points each:
[10] Name this city. During World War II, Edward Ellsberg described his experience clearing the ships that Mario Bonetti scuttled to blockade this city in *Under the Red Sea Sun*.
ANSWER: **Massawa**
[10] Massawa is in this modern-day country, and was once connected to its capital by the world's longest cableway. The EPLF fought to secure this country's independence from the regime of Mengistu Haile Mariam.
ANSWER: **Eritrea** [or State of **Eritrea**; or Hagärä **Ertra**]
[10] This colonial power built the Asmara-Massawa Cableway and based its Red Sea Flotilla in Massawa. This power's previous attempt to colonize Ethiopia was stopped at the Battle of Adwa.
ANSWER: **Italy** [or **Italian Republic**; or Repubblica **Italia**na]
<KS, Other History>

8. Answer some questions about prayers, mantras, and meditations that get a bit repetitive, for 10 points each:

[10] A significant number of Hindu and Buddhist mantras start with or otherwise involve this cosmic syllable. This holy Sanskrit syllable is repeated at the start and end of a mantra often translated as "the jewel is in the lotus."
ANSWER: **om** [accept **omkar**a or **onkar**a; accept **pranav**a; accept **udgith**a]
[10] The namesake founder of this school of Japanese Buddhism held that repeating "*Nam-myōhō-renge-kyō*" ("NAHM-m'YO-ho-REN-gay-k'YO") was enough to reach enlightenment and launched "Four Great Denunciations" of rival schools like Tendai and Shingon.
ANSWER: **Nichiren** Buddhism
[10] This Greek prayer sung during the Adoration of the Cross on Good Friday states "Holy God, Holy Mighty, Holy Immortal." It was supposedly written by a projectile Byzantine baby that was sent airborne by an earthquake but landed miraculously unharmed.
ANSWER: **Triságion** ("tree-SAH-ghee-on") [accept **Ἅgios ὁ Theós** ("AH-yoss ho theh-OHSS"); prompt on the (literal) translation Thrice Holy or Three Holies and equivalents]
<JG, Religion>

9. The response to this event in the form of the Kinzua Dam took almost 25 years to implement, in part due to the fact that it involved gratuitously seizing Seneca land, as recounted in a 1964 Johnny Cash album. For 10 points each:
[10] Name this 1936 event that killed 69 and injured over 500 when unusually high spring rains and runoff overwhelmed measures like the Quemahoning ("kwee-mah-HO-ning") Dam. Rumors that the 16th Street Bridge collapsed were false.
ANSWER: **St. Patrick's Day Flood** [accept the 1936 **Pittsburgh Flood** or the **Second Johnstown Flood**; prompt on Johnstown Flood; prompt on partial answers]
[10] The St. Patrick's Day Flood prompted a burst of New Deal flood control legislation, which earlier included the act creating this hydroelectric and water management agency championed by George Norris.
ANSWER: **Tennessee Valley Authority** [or **TVA**]
[10] The failure of the St. Francis Dam, resulting in over 400 deaths, ended the career of this civil engineer and city planner, who commandeered the water of the Owens Valley for Los Angeles in the California Water Wars.
ANSWER: William **Mulholland**
<JG, US History>

10. The Loeb Library called the work of one of these authors "superior in arrangement, vividness, and description of character" to the other. For 10 points each:
[10] Identify *both* of these authors, one Greek and one Roman, best-known for their treatments of the same story. The Roman author's version of the story ends abruptly, with Absyrtus ("AB-ser-tuss") still alive.
ANSWER: **Apollonius** of Rhodes AND Gaius Valerius **Flaccus**
[10] Unlike Apollonius of Rhodes, Valerius Flaccus depicted this leader of the Argonauts as a consistently quick-thinking, heroic figure.
ANSWER: **Jason**
[10] Both authors began their versions of the *Argonautica* with this king of Iolcus ("aye-OL-cuss") sending Jason on a quest for the Golden Fleece. Later, Medea ("meh-DEE-uh") tricks this king's daughters into murdering him.
ANSWER: **Pelias**
<INB, Mythology>

11. Carlo Maderno ripped off the design of this building's façade for his design of the façade of Santa Susanna. For 10 points each:
[10] Name this building whose proto-Baroque façade was designed by Giacomo della Porta, who integrated the double pilasters of Michelangelo and the Romanesque style scroll buttresses of Alberti.
ANSWER: **Il Gesù** ("JEH-zoo") [or the Church of the **Jesuits**; or the **Church of the Gesù**]
[10] Giacomo della Porta also completed Michelangelo's design for the dome of this Vatican City basilica, which was primarily designed by Donato Bramante and named for the first pope.

ANSWER: **St. Peter's** Basilica

[10] Alberti used the aforementioned scroll buttresses in his design for the polychrome façade of this Dominican church in Florence honoring the Virgin Mary. This church is also the home of Masaccio's *Holy Trinity*.

ANSWER: **Santa Maria Novella**

<AK, Architecture>

12. The disproportionate returns to expressiveness and enthusiasm for these people is called the "Dr. Fox effect," and they often use the ADDIE ("addy") and Dick and Carey models to theorize their activities. For 10 points each:

[10] A Lenore Jacobsen and Robert Rosenthal study on the impact of these people's expectations coined the term "Pygmalion effect." These people are most effective when they create what Jerome Bruner called "scaffolding."

ANSWER: **teach**ers [accept obvious equivalents like **instruct**ors, **educat**ors,, or **professor**s and word forms; prompt on answers like "people in <u>schools</u>" or "people in <u>classrooms</u>"; do not accept or prompt on "students"]

[10] The Rosenthal-Jacobsen study was savaged by Robert Thorndike, whose dad Edward's "law of effect" was a basis for Skinner's study of this type of learning. This type of learning is based on reinforcement and punishment.

ANSWER: **operant condition**ing [accept word forms; accept **instrumental condition**ing; prompt on <u>conditioning</u>; do NOT accept or prompt on "classical conditioning"]

[10] Rosenthal mentored this psychologist of intuition, who tragically died of leukemia in part due to lack of South Asians in bone marrow registries. This psychologist coined the term "thin-slicing" to describe surprisingly accurate judgments based on tiny amounts of information.

ANSWER: Nalini **Ambady**

<JG, Psychology>

13. This behavior's anti-predator function can be explained by the confusion and dilution effects. For 10 points each:

[10] Name this behavior that is often done to increase the effectiveness of broadcast spawning. Despite its advantages, this behavior can also lead to excretion building up and the depletion of food and dissolved oxygen.

ANSWER: **school**ing [accept **shoal**ing; accept **school** of fish or fish **school**]

[10] Studies have shown that fish are still able to school when blinded, but not when these sensory organs are cut. These sensory organs mediate rheotaxis, the ability of fish to orient themselves based on current direction.

ANSWER: **lateral line**s [accept **lateral line** system or **LLS**; accept **lateral line** organ or **LLO**; anti-prompt on superficial <u>neuromasts</u>, freestanding <u>neuromasts</u>, or canal <u>neuromasts</u>]

[10] Because of their sensitivity to movement and pressure gradients in water, lateral lines can be damaged by this phenomenon. The ability of cetaceans to communicate is disrupted by this phenomenon.

ANSWER: **sound** [accept **noise**]

<JS, Biology>

14. The "Aqua Tofana" was invented to perform this act, and the "Angel-Makers of Nagyrev ("NAJ-reff")" performed this act for hire in Hungary, where it used to be a surprisingly common dispute resolution mechanism. For 10 points each:

[10] Describe this act, for which purpose Livia Drusilla supposedly painted figs when she lost access to the kitchen preparing the emperor's food. Lucrezia Borgia is likely unfairly infamous for doing this in order to get remarried.

ANSWER: **poison**ing people (particularly husbands) [accept obvious equivalents]

[10] This woman allegedly served Claudius a plate of poisoned mushrooms. Allegedly a serial husband-poisoner, this woman was herself the target of slapstick murder plots by her son, like one involving a rigged boat.

ANSWER: **Agrippina** the **Younger** [accept **Julia Agrippina** or **Agrippina Minor**; prompt on <u>Agrippina</u>]

[10] The "Angel-Makers of Nagyrev ("NAJ-reff")" supposedly got their husband-poisoning arsenic by boiling these objects. The "Black Widows of Liverpool" ran a for-hire husband-poisoning operation based on boiling these things.

ANSWER: **flypaper** [accept obvious equivalent descriptions like "**paper** used to kill **flies**"]

<JG, European History (Commonwealth, Ancient, Historiography)>

15. A 2018 book by John Hawthorne and Juhani Yli-Vakkuri ("YOO-ha-nee EE-lee-VAK-koo-ree") is titled for this context-independent concept and attempts to refute its existence using the example of the Mirror Man. For 10 points each:
[10] Name this concept that has been defined as the diagonals of Robert Stalnaker's two-dimensional semantics. "Extreme internalists" have argued against the existence of the 'broad' counterpart to this concept, which was defended in Tyler Burge's arthritis thought experiment.
ANSWER: **narrow content** [prompt on partial answers; or **narrow mental content**]
[10] An argument against narrow content was put forth by Hilary Putnam with a paper that asserts "[this concept] just ain't in the head" and features the Twin Earth thought experiment. This concept is studied in semantics.
ANSWER: **meaning**
[10] This philosopher initially developed but later abandoned a view of narrow content as mapping a context onto broad content in his book *Psychosemantics*. He also developed the "language of thought" hypothesis.
ANSWER: Jerry **Fodor** [or Jerry Alan **Fodor**]
<AK, Philosophy>

16. This F major, 12/8-time ("twelve-eight-time") cavatina begins with the soprano sustaining a *messa di voce* A4 ("A-four") for seven-and-a-half beats. For 10 points each:
[10] Name this Act I aria which concludes with a two-octave *coloratura* passage on the words "*ah, si*," between statements of the declaration "*che regnar tu fai nel ciel*" ("keh ren-YAR too FYE nell ch'YELL").
ANSWER: "*Casta diva*"
[10] "*Casta diva*" hails from this composer's 1831 opera *Norma*, whose title druid has an affair with the Roman proconsul Pollione, for which both are burnt alive to death.
ANSWER: Vincenzo **Bellini** [or Vincenzo Salvatore Carmelo Francesco **Bellini**]
[10] The operas of Bellini and compatriot Gaetano Donizetti exemplify this lyrical style that stressed precise execution of tempo, dynamic, and ornamentation.
ANSWER: *bel canto*
<KL, Classical Music and Opera>

17. Cylindrical mirror analyzers used in this technique offer higher solid angles but lower resolution than concentric hemispherical analyzers. For 10 points each:
[10] Name this technique. A type of this technique uses aluminum's K-alpha line as a source and produces a plot of a surface's binding energy by subtracting the electron kinetic energy from the incident photon's energy.
ANSWER: **PES** ("P-E-S") spectroscopy [accept **photoelectron** spectroscopy; accept **photoemission** spectroscopy; accept **XPS** or **x-ray photoelectron** spectroscopy; accept **ESCA** or **electron spectroscopy for chemical analysis**; accept **AES** or **Auger electron spectroscopy**]
[10] This is the lightest element that can be detected by a type of PES spectroscopy called XPS spectroscopy. This lightest alkali metal has an electron configuration that ends in 2s1 ("two-S-one").
ANSWER: **lithium** [or **Li**]
[10] In an XPS system, this component is usually made of an ellipsoid-shaped piece of quartz. When using hollow cathode lamps in atomic absorption spectroscopy, this component of the setup does not need to be high resolution.
ANSWER: **monochromator** [prompt on filter]
<AK, Chemistry>

18. During a conversation with this character, Dr. Monygham proposes that "what really defeats a man" is that "crushing, paralyzing sense of human littleness." For 10 points each:
[10] Identify this character who meets his demise when an old shopkeeper confuses him for the vagabond Ramirez and shoots him. The novel ends by describing this character's "genius," which "dominated the dark gulf containing his conquests of treasure and love."
ANSWER: **Nostromo** [or Giovanni Battista **Fidanza**]

[10] Nostromo is entrusted with transporting precious metal by Charles Gould, one of the wealthy silver mine barons of this country. This country's dictator Guzman Bento is replaced by President Ribiera.
ANSWER: **Costaguana**
[10] This author of *Lord Jim* drew on the geography of Colombia to create the fictional Costaguana in his novel *Nostromo*.
ANSWER: Joseph **Conrad** [or Jozef Teodor Konrad **Korzeniowski**]
<INB, Long Fiction>

19. A newly-elected government headed by Gaston Eyskens ended a crisis in which an institution in this city split into two factions, mirroring a similar split in the Christian Social Party. For 10 points each:
[10] Name this city whose Catholic university divided into two separate institutions based on language in 1968. The predecessor to those universities was founded by Pope Martin V ("the-fifth") upon request by John IV ("the-fourth"), Duke of Brabant.
ANSWER: **Leuven** [or **Louvain**]
[10] The Old University of Leuven was a stronghold of this theological movement based heavily on the work of Saint Augustine of Hippo. Blaise Pascal defended this movement against the Jesuits in his *Provincial Letters*.
ANSWER: **Jansenism** [accept word forms]
[10] The Universities of Leuven and Cologne were among the first institutions to condemn this religious reformer, who criticized the Catholic Church's selling of indulgences in his *Ninety-Five Theses*.
ANSWER: Martin **Luther**
<KS, European History (Continental)>

20. In the poem "In Newport I Watch My Father Lay His Cheek to a Beached Dolphin's Wet Back," Ocean Vuong quotes this line of poetry after onomatopoeically evoking the "pow pow pow" of a sniper. For 10 points each:
[10] Identify this opening line of a poem whose fatally wounded speaker tells his friend, "I want to die / decently, in my bed. / Bravely, if it's possible, / in the soft sheets of Holland."
ANSWER: "**Green, how I want you green**" [or "**Verde que te quiero verde**"; accept similar translations, such as "**Green green I want you green**"] (The second poem is "Sleepwalking Ballad" by Federico Garcia Lorca.)
[10] In "Notebook Fragments," Vuong warns that if a guy tells you this is their favorite poet, "there's a very good chance he's a douchebag." This poet of *Mexico City Blues* typed his most famous book onto a 120-foot-long scroll.
ANSWER: Jack **Kerouac** ("ker-roo-ACK") [or Jean-Louis Lebris de **Kérouac**]
 [10] In Vuong's poem "On Earth We're Briefly Gorgeous," this relative's "muffled cries" teach the speaker "that a man in climax was the closest thing / to surrender." Sylvia Plath wrote a poem telling the person with this relation to her, "You bastard, I'm through."
ANSWER: the poet's **father** [or **dad**; accept "**Daddy**"]
<INB, Non-epic Poetry>