

2022 ACF Regionals

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Packet E by Northwestern, GWU A, GWU B, UNC A

TOSSUPS

1. In a novel by this author, a character cries after winning a boxing match that he was supposed to throw, claiming that he thought it was only the second round. A character created by this author wins a set of encyclopedias in a dish-drying competition but discovers that all the volumes except for “A” are fake. The protagonist of a novel by this author is arrested for riding in a stolen car and sent to a juvenile reform school in Florida, where he meets a character who eventually adopts his name, Elwood. Another character created by this author is cared for by Martin and Ethel while staying in their attic. An alternate history novel by this author recounts Cora and Caesar’s escape from a Georgia plantation. For 10 points, name this author of the Pulitzer Prize–winning novels *The Nickel Boys* and *The Underground Railroad*.

ANSWER: Colson **Whitehead** [or Arch Colson Chipp **Whitehead**]
<American Literature>

2. The memoir *House of Stone* uses this city’s tiles to represent various groups analyzed in *A House of Many Mansions*. Youssef Aftimus designed this city’s bullet-scarred Yellow House, which escaped its rebuilding by Solidere (“SO-lee-dair”). Samir Kassir’s history of this city discusses poverty found by the IRFED study here despite its veneer as the capital of a “Switzerland of the East” after a 1958 “crisis” empowered Fuad Chehab. Ariel Sharōn (“ah-ree-EL shah-ROHN”) was called the “butcher” of this city after the Kataeb Party killed Palestinian refugees here in the 1982 Sabra and Shatila massacre. Rafik Hariri’s death in this city catalyzed the end of its 1976 to 2005 occupation by Syria. Phoenicianist Maronites supported this city’s Cedar Revolution. For 10 points, Najib Mikati retook power in what Mediterranean capital after a 2020 ammonium nitrate explosion?

ANSWER: **Beirut**, Lebanon [or **Bayrūt** or **Beyrouth**; accept 2020 **Beirut** explosion; accept “Butcher of **Beirut**”]
(Rafik Hariri was killed in the bombing of the iconic St. George Hotel.)
<World History>

3. Bonds between carbon and this heteroatom are stereoselectively converted to alcohols in the Fleming–Tamao oxidation. A species centered on a hypervalent atom of this element forms in the first step of the palladium-catalyzed Hiyama coupling. This element stabilizes some molecules due to being more electropositive than carbon, in the beta “this element” effect. Alcohols can rearrange via a pentavalent species of this element in the 1,2 (“one-two”) Brook rearrangement to form ethers containing this element. When bonded to an alkoxy group, this element forms ethers such as TBDMS, which are useful as protecting groups for alcohols. This atom readily forms tetrahedral molecular geometry because it is normally tetravalent. For 10 points, name this element below carbon in the periodic table, with atomic number 14.

ANSWER: **silicon** [or **Si**; accept beta **silicon** effect] (The protecting groups are silyl ethers.)
<Chemistry>

4. *Two answers required.* Jaime (“HAI-may”) Laredo and Sharon Robinson premiered a concerto for these two instruments by Ellen Zwilich. Zoltán Kodály’s (“ZOHL-tahn KOH-dai’s”) opus 7 duo for these two instruments has been recorded by the Capuçon (“cah-pew-so”) brothers. Robert Hausmann played one of these instruments, while the other was played by a virtuoso whose personal motto was represented by the A-E-F motif in a concerto for these two instruments. These two instruments are played by the soloists in Brahms’s A-minor Double Concerto. One of these instruments was played by Jacqueline du Pré, while the other was played by Fritz Kreisler. These two instruments play with a keyboard instrument in standard piano trios. For 10 points, name these two instruments, the highest- and third-highest-pitched string instruments in a standard orchestra.

ANSWER: **violin** [accept **fiddle**] AND **cello** [accept **violoncello**] (The personal motto of the violinist Joseph Joachim was “frei aber einsam,” or “free but lonely.”)

<Classical Music>

5. Ash’ari innovator Ibn Kullāb argued in favor of a theological doctrine concerning this entity by introducing a distinction between words themselves and their realization. For holding fast to a doctrine about this entity, Ahmad ibn Hanbal was tortured. Abbasid caliph al-Ma’ mūn persecuted individuals who held a specific belief about this entity in what has been called the first Islamic inquisition, the 9th-century Mihna. Opposition to a doctrine about this entity was a pillar of the Mu’tazila school, whose adherents believed ascribing an eternal existence to this entity to be a violation of *tawḥīd* (“tao-HEED”). Kharijites (“KAH-ruh-jites”) and Sunnis affirm the “uncreatedness” of this entity, believing that it was neither spoken into being nor composed by Muhammad. For 10 points, name this text that contains the Throne Verse, the holiest book of Islam.

ANSWER: **Qur’ān** [or **Koran**; accept **Quranic** uncreatedness or the uncreated **Qur’ān**; accept the **divine speech** or **speech of Allah**]

<Religion>

6. Lower production of this substance may explain epidemiology’s “African enigma.” This substance reduces expression of the adhesin SbaA (“sab-A”) and causes lipid rafts to cluster with “petals” dissociated from hexamers of the pore-forming virulence factor VacA (“vack-A”). A microaerophilic relative of *Campylobacter* uses the chemoreceptor TlpB to swim against the gradient in this substance, which it evades by expressing urease (“YUR-ee-ace”). In the presence of this substance, ferric iron is reduced to soluble ferrous iron. This substance acts as a bactericidal chemical barrier to fecal-oral infection that fails against *H. pylori* (“pai-LOR-ee”). PPIs block production of this substance, which is secreted with intrinsic factor by parietal (“puh-RAI-uh-tul”) cells to activate the protease (“PRO-tee-aze”) pepsin. For 10 points, Alka-Seltzer treats heartburn caused by “reflux” of what digestive fluid with a low pH?

ANSWER: **stomach acid** [or **gastric acid** or **gastric juice**; accept **hydrochloric acid** or **HCl**; prompt on strong **acid** or **acid** reflux or **antacids**; prompt on digestive **fluid** before read; prompt on **H⁺** (“H-plus”) or **protons**] (PPIs are proton-pump inhibitors. The “African enigma” refers to the high prevalence of *H. pylori* infection and low incidence of gastric cancer throughout much of Africa; there is also a similar “Asian enigma.”)

<Biology>

Note to moderator: read the answerline carefully.

7. Marianna Di Paolo demonstrated how multiple words that express this concept are combined in Texas English. In a book on this concept, Frank Palmer demonstrates that it can be intensified by a change of tense in English. This concept is usually divided into dynamic, deontic, and epistemic forms. In most languages, this concept includes one *realis* and multiple *irrealis* examples. A verb marked for this concept can be introduced by the French conjunction “que.” In English, verbs that express this concept are defective, do not add an S ending in the third-person singular, and tend to be auxiliary. The subjunctive is an example of, for 10 points, what concept associated with verbs that convey obligation or possibility, such as “might” and “should”?

ANSWER: **modality** [or **moods**; accept **modal** verbs; prompt on **auxiliary** verbs or **helping** verbs or **helper** verbs by asking “what concept do those verbs indicate?”; prompt on **subjunctive** by asking “the subjunctive is an example of what more general concept?”; prompt on **necessity** or **obligation** or **possibility** or **potentiality** or **ability** by asking “that concept is conveyed by what type of verb?”]

<Social Science>

8. Aaron Mair denounced a 2020 “revisionist and ahistorical” history of this man that ties him to the eugenics of David Starr Jordan. This man argued the government might as well target “the people’s cathedrals and churches” in opposition to a project organized by Michael O’Shaughnessy. After a bout of temporary blindness while working in a carriage factory, this man walked from Indiana to Florida, which he documented in *A Thousand-Mile Walk to the Gulf*. In articles published in *The Century*, this man wrote about the “treasures” and “features” of a location where he opposed the damming of the Hetch Hetchy Valley. For 10 points, name this Scottish American “Father of the National Parks,” an advocate for Yosemite National Park who founded the Sierra Club.

ANSWER: John **Muir** (“myoor”)

<American History>

9. In a novel titled for this character, the historian Lucas accidentally hits a man with a baseball bat while trying to murder his brother. This character accuses another man of lacking “lewte” (“LOO-tuh”), which can be translated as “loyalty” or “legality.” A 1993 Iris Murdoch novel is named for this man, whose horse is adorned with golden wire. This man owns a mound of earth that he calls his Chapel, fords a stream to fight a wild boar, and exchanges a fox for three kisses. Because another man failed to tell him about a girdle, this character gives him a small cut. This character survives a deadly “Christmas game” and tells a man to return in a year to repay a certain action. For 10 points, name this title character of a poem by the Pearl Poet, who competes in a beheading contest with Sir Gawain.

ANSWER: the **Green Knight** [or Sir **Bertilak** de Hautdesert]

<British Literature>

10. The second track on this album features the brass alternating in swinging rhythm between F-sharp and G, followed by the ascending motif E, F, F-sharp. The music on this album was largely inspired by an anthology gifted by Beverly Bentley and a concert that its lead artist attended with Frances Taylor. Paul Chambers played bass and Jimmy Cobb the drums on this third-stream 1960 album, which comes chronologically between *Workin’* and *Steamin’* in its lead artist’s discography. Tracks titled “Saeta” and “Solea” close this album, whose music was arranged by Gil Evans. A version of Manuel de Falla’s (“day FAH-yah’s”) “Will o’ the Wisp” and an arrangement of Joaquin Rodrigo’s (“wah-KEEN ro-DREE-go’s”) *Concierto de Aranjuez* appear on, for 10 points, what Miles Davis album inspired by the music of an Iberian country?

ANSWER: **Sketches of Spain**

<Other Fine Arts>

11. A novel titled for this sort of person mocks the philosopher Seneca and describes the narrator's visit inside a large model of Queen Isabella's vagina. *Marks of Identity* is followed by a novel named for one of these people named Julian in a trilogy by Juan Goytisolo ("GOY-tee-so-lo"). Another novel ends by noting that "all human wisdom is contained" in the motto of one of these people, "Wait and hope!" One of these people adopts the identity of "Sinbad the Sailor" while saving his former employer from financial ruin, then reunites that man's son with his lover Valentine. A person adopts this title after being tutored by Abbé Faria ("ah-BAY fah-ree-AH") during his imprisonment at the Château d'If ("shah-TOH deef"). For 10 points, the vengeful Edmond Dantès adopts what title of *Monte Cristo*?

ANSWER: **count** [or **comte**; or **conde**; accept *The **Count** of Monte Cristo* or *Le **Comte** de Monte-Cristo*; accept ***Count** Julian* or *Reivindicación del **conde** don Julián*; prompt on **lord** or **nobleman** or **don**]
<European Literature>

12. During a fight for control of this place, the arm of a deity turned into an icicle. Similar to Melusine ("may-loo-ZEEN"), the grandmother of a ruler of this place returned to the sea after her husband, a hunter, spied on her during childbirth. A deity bullied by his many brothers was assisted by a hare who had its fur ripped off traveling from one region of this place to another. It's not the sea, but this place began to be governed by a deity after he stole a lute and fled the subterranean realm of his father-in-law. A ruler's conquest of this place was guided by a three-legged crow. An ancestral goddess bestowed a jewel, sword, and mirror upon rulers of this country. For 10 points, Jimmu ruled what country, whose emperors claim descent from Amaterasu?

ANSWER: the islands of **Japan** [or **Nihon** or **Nippon**; accept *Toyo**ashihara no Nakatsukuni*** or ***Central Land of Reed Plains***; accept ***Akitsukuni*** or *Toyo-**akitsushima***; accept **Izumo**; accept **Inaba**; accept **Yamato**; prompt on any answers indicating the earthly realm] (The first clue refers to Takemikazuchi. The third and fourth lines are about Ōkuninushi.)
<Mythology>

13. The line, "I will uphold" ends an "Apology" written by a noble of this name after an edict of outlawry against him was pushed by Cardinal Granvelle. A lord of Lumey with this name captured the port of Brielle after being exiled from England. For a noble with this name, Philips of Marnix named and composed the oldest extant national anthem. This name was shared by both the organizer, and the first admiral, of the Watergeuzen. A noble with this name was the first head of state to be assassinated by handgun when Balthasar Gérard shot him. A stadtholder nicknamed "the Silent" had this name, which was also shared by the victor at the Battle of the Boyne. For 10 points, give this name of a prince of Orange who was installed on the British throne after the Glorious Revolution.

ANSWER: **William** [accept **William** III of England or **William** of Orange or **William** II of Scotland; accept **William** the Silent; accept **William** II de La Marck; accept **Willem** in place of "William" in any name; accept "**Wilhelmus**"]
<European History>

14. CNOT ("C-not") gates can be implemented by controlling the blockade created by states named for this scientist that prevents the excitation of nearby atoms. Nobel laureate Serge Haroche ("serj ah-rosh") detected single photons using states named for this scientist, in which the principal quantum number is shifted by a quantum defect. This scientist names neutral atoms in which the valence electron has a very large principal quantum number. A unit named for this scientist equals half a hartree. An equation developed by this scientist calculates the wavelengths of electronic transitions that make up the Lyman, Balmer, and Paschen series. For 10 points, a constant of about 13.6 electron volts appears in a formula describing the spectra of hydrogen and hydrogen-like elements named for what Swedish physicist?

ANSWER: Johannes **Rydberg** [or Janne **Rydberg** or Johannes Robert **Rydberg**; accept **Rydberg** formula; accept **Rydberg** states; accept **Rydberg** atoms; accept **Rydberg** blockade]
<Physics>

15. A yellow alarm box replaces one of these objects in a 2014 Banksy mural, whose subject was given a face mask in April 2020. Astrophysicist Vincent Icke speculated that one of these objects in a painting was made of polished tin, due to its pear-like shape and reflective surface. Two of these objects appear prominently in a painting of a woman wearing a yellow jacket lined with fur titled *A Lady Writing a Letter*. The Mauritshuis contains a *tronie* titled for one of these objects that has been called the “*Mona Lisa of the North*” due to its subject’s lack of eyebrows, slightly open mouth, and enigmatic gaze over her shoulder toward the viewer. For 10 points, a portrait of a girl in a blue-and-yellow turban by Johannes Vermeer depicts her wearing what piece of jewelry?

ANSWER: pearl **earrings** [accept *Girl with a Pearl Earring*; prompt on pearl or *Meisje met de parel*]
<Painting/Sculpture>

16. Julie Langford proposes civilian legitimization of this dynasty as the reason that a ruler created the title of Mater Castrorum to bestow on his wife. During a birthday celebration for a ruler of this dynasty, Saints Perpetua and Felicity were martyred in Carthage. After the death of this dynasty’s last ruler, power was held by a series of “barracks emperors.” The face of a member of this family was erased from the Berlin Tondo via a *damnatio memoriae* after his brother supposedly murdered him in their mother’s arms. Julia Domna starved herself to death after hearing of Macrinus’s assassination of her son, a ruler from this dynasty who granted Roman citizenship to all free men in the Antonine Constitution. For 10 points, name this dynasty of Caracalla, founded in 193 CE by Septimius.

ANSWER: **Severan** dynasty [accept Septimius **Severus**; accept **Severus** Alexander; accept **Severan** Tondo] (Julie Langford wrote *Maternal Megalomania: Julia Domna and the Imperial Politics of Motherhood*.)
<Other History>

17. A novel from this non-European country was praised in the article “Blithe Spirits” by Dylan Thomas. Another novel from this country describes spirits who “feasted much because of the beautiful terrors of eternity” and opens, “In the beginning there was a river.” In another novel from this country, a woman is abducted by a “Complete Gentleman” who turns out to be a skull that has rented every other body part. In a novel from this country, Madame Koto attempts to attract good luck by encouraging visits from Azaro, an *akibu*. An author from this country wrote *My Life in the Bush of Ghosts* and depicted the quest to rescue a tapster from Dead’s Town in the novel *The Palm-Wine Drinkard*. For 10 points, name this birth country of Amos Tutuola and the author of *The Famished Road*, Ben Okri.

ANSWER: **Nigeria** [or Federal Republic of **Nigeria** or Orílẹ̀-èdè Olómíniira Àpapọ̀ **Nàìjíríà** or Ọ̀hànjíkò Ọ̀hànézè **Nàìjíríyà** or Jamhuriyar Taraiyar ta **Najeriva**]
<World Literature>

18. During *bajadas* in this region, traditional stick fighting honors the Virgin of Candelaria, a Black Madonna venerated at a sanctuary in the Cave of San Blas. Uncooked onion scoops are used to eat purees of this region’s toasted flour, gofio. In this region, people in El Hierro adopted the whistle language of Silbo created by shepherds in the mountains of La Gomera. This region’s name derives from Roman observations of dog worship among its Guanche (“GWAHN-chay”) people. A “mega-tsunami” theory centers on the collapse of this archipelago’s Cumbre Vieja (“KOOM-bray vee-AY-hah”) volcano on its island of La Palma. Tenerife is the largest island of, for 10 points, what Spanish archipelago off the coast of Morocco whose name identifies a certain species of yellow bird?

ANSWER: **Canary** Islands [or the **Canaries** or Las **Canarias**; accept **Tenerife** or La **Gomera** before read; prompt on Atlantic Ocean by asking “where?”]
<Geography>

19. This philosopher's zoogony uses the analogy of a painter of sacrificial offerings to explain how animals are formed from matter mixed in differing proportions. Theophrastus's *On Sensations* is devoted to criticizing this philosopher's pore- and effluence-based theories of perception. This non-Pythagoras philosopher wrote, "I have already been . . . a boy and a girl, a shrub and a bird," in a poem promoting the transmigration of souls called *Purifications*. This philosopher's cyclic cosmogony states that love unites all things into a sphere, while strife drives them apart. This philosopher first enumerated a list of four "roots" of all matter that Aristotle renamed the four classical elements. For 10 points, name this pre-Socratic philosopher who may have died after throwing himself into Mount Etna.

ANSWER: **Empedocles** of Acragas

<Philosophy>

20. A Google grouplet started a campaign called "[doing this task] on the Toilet" that posted tutorials in bathroom stalls. James Whittaker outlines how to plan this task with ACC analysis in the 2012 book *How Google [does this task]*. A framework for this task uses the annotations BeforeAll and AfterAll to set up and tear down. This task is done independently of complex components by replacing them with simple objects called mocks or stubs. xUnit ("x-unit") is a group of frameworks for writing programs for this task, which are evaluated by their coverage. This task should "drive development." Debugging and this task specify conditions with assert statements. In a form of this task, customers identify bugs in beta versions of software. For 10 points, name this task of assessing software behavior.

ANSWER: software **testing** [accept unit **testing**; accept integration **testing**; accept system **testing**; accept beta **testing**; accept user acceptance **testing**; accept **test**-driven development; accept *How Google Tests Software*; accept "**Testing** on the Toilet"; accept **QA** or **quality assurance**; reject "debugging"] (ACC analysis is Attribute Component Capability analysis.)

<Other Science>

Tiebreaker. *Common or taxonomic name acceptable.* "Majors" of some species in this order defend resource piles more than alternative male morphs called "minors." Terry Erwin discovered 439 species in this order with canopy fogging. Members of this order's family Meloidae secrete the caustic terpenoid cantharidin, while some species in its large "ground" family mix solutions of hydroquinone and hydrogen peroxide with catalase to exothermically release noxious vapor. Structural coloration in this holometabolous order's family Buprestidae gives an iridescent, jewellike appearance to their elytra forewings. J. B. S. Haldane quipped that the creator "must have an inordinate fondness" for these insects; their 360,000-plus species include the Hercules rhinoceros. For 10 points, 25% of all animals belong to what order that includes bombardier, stag, and scarab species?

ANSWER: **beetles** [or **Coleoptera**; accept scarab **beetles** or dung **beetles**; accept stag **beetles**; accept bombardier **beetle**; accept Hercules **beetle** or rhinoceros **beetles**; accept ground **beetles**] (The first line refers to dung beetles.)

<Biology>

BONUSES

1. A prince with this name signed the Treaty of Windsor with Richard II to fund the defense of Portugal from impending aggression by the house of Trastámara. For 10 points each:

[10m] Give this name of that prince, who married his daughter Philippa to a Portuguese king of this name. Two kings with this name squared off over the Portuguese throne at the Battle of Aljubarrota.

ANSWER: **John** [accept **John** I of Portugal or **João** I or **John** the Good of Portugal; **Juan** I; accept **John** of Gaunt; accept, BUT DO NOT OTHERWISE REVEAL, **John** I of Castile]

[10e] With a victory at the Battle of Aljubarrota, João I ensured the independence of Portugal from this kingdom, which unified with Aragon after the marriage of Isabella and Ferdinand.

ANSWER: **Castile** [or Kingdom of **Castile** or Reino de **Castilla** or Regnum **Castellae**]

[10h] Afonso Henriques, the first king of Portugal, captured Lisbon from a *taifa* based in this city, where Alfonso X of Castile renounced claims to the Portuguese Kingdom of the Algarve (“ahl-GAR-vih”) in a 1267 treaty. A later treaty signed in this city capped off a Spanish invasion of Portugal during the War of the Oranges.

ANSWER: **Badajoz** [accept Taifa of **Badajoz** or Ṭā’ifa al-**Batalyaws**; accept 1801 Treaty of **Badajoz** or Peace of **Badajoz**; accept 1267 Treaty of **Badajoz**]

<European History>

2. These systems can be used to provide a well-defined boundary between the solution and an electrode. For 10 points each:

[10h] Name these systems that spontaneously form when the head groups of organic molecules adsorb to a substrate and the tail groups organize due to intermolecular forces.

ANSWER: **self-assembled monolayers** [or **SAMs**; prompt on monolayers; prompt on thin films]

[10m] The thickness and optical properties of SAMs can be measured using the surface-enhanced form of this technique. In general, this technique is sensitive to internal degrees of freedom, as it involves Stokes or anti-Stokes shifts that change photon wavelength.

ANSWER: **Raman** spectroscopy [accept surface-enhanced **Raman** scattering]

[10e] SAMs formed on metal substrates often have thiol headgroups, meaning they end with an atom of this element bonded to hydrogen. This element is also found in the compounds responsible for the strong smell of garlic and rotten eggs.

ANSWER: **sulfur** [or **S**]

<Chemistry>

3. Answer the following about literary women named Celia, for 10 points each.

[10e] This author asks the title woman to “drink to me only with thine eyes” in his poem “To Celia.” The disguised title character attempts to rape Corvino’s wife Celia in this author’s play *Volpone*.

ANSWER: Ben **Jonson** [or Benjamin **Jonson**]

[10m] In a novel, this woman takes pleasure in giving up jewelry to her flightier sister Celia. Celia marries James Chettam after this woman rejects him and instead marries the dour author of *The Key to All Mythologies*.

ANSWER: **Dorothea** Brooke [or Dorothea **Brooke**] (from George Eliot’s novel *Middlemarch*)

[10h] George Eliot may have taken Celia Brooke’s name from a character in this Jonathan Swift poem, whose misogyny was parodied by Lady Mary Montagu. In this poem, Strephon is shocked that “Celia, Celia, Celia shits!”

ANSWER: “The **Lady’s Dressing Room**”

<British Literature>

4. This thinker's book *Big Structures, Large Processes, Huge Comparisons* lists eight "pernicious postulates," such as the view that state violence is legitimate but individual violence is illegitimate. For 10 points each:

[10h] Name this historical sociologist who famously asserted that "war made the state and the state made war." This scholar analyzed national state formation in books like *Coercion, Capital, and European States, AD 990–1992*.

ANSWER: Charles **Tilly**

[10m] In a 1998 book, Tilly argued that this phenomenon often remains "durable" when it involves categorical pairs. A best-selling, 700-page book argues that the condition $r > g$ ("R is greater than G") cements this phenomenon, which is extreme in Belize, São Tomé and Príncipe, and Namibia.

ANSWER: **inequality** [or **disparity**; accept economic **inequality** or income **inequality** or wealth **inequality**; accept **wealth concentration** or **wealth gap** or **income gap** or similar; accept *Durable Inequality*; prompt on **distribution of wealth** or similar] (The second book is *Capital in the Twenty-First Century* by Thomas Piketty. The countries listed have some of the highest Gini coefficients.)

[10e] In *Durable Inequality*, Tilly discusses this variable as a visible marker of sex differences and malnutrition that historically caused stunting. On average, this anthropometric variable is low for the Bambenga and high for the Dutch.

ANSWER: **height** [or **stature**; or **tallness** or **shortness** or equivalents; prompt on body **size**] (The Bambenga are often called "Pygmies.")

<Social Science>

5. An artwork at one of these locations in the Palazzo Pitti depicts a group of cherubs carrying the Medici coat of arms. For 10 points each:

[10m] Identify these locations that were often painted by Pietro da Cortona. Illusionistic techniques for painting these locations include *di sotto in sù* and *quadratura*.

ANSWER: **ceilings** [or **vaults**; accept any answers about **ceiling** painting]

[10h] Pietro da Cortona was commissioned by Urban VII to create this ceiling fresco for the grand salon of the Palazzo Barberini. Several golden bees appear below a personification of Rome holding the Crown of Immortality in this painting.

ANSWER: *Allegory of **Divine Providence** and Barberini Power* [or *Il Trionfo della **Divina Provvidenza***; accept any answer that includes **Divine Providence**]

[10e] Pietro da Cortona worked on the Palazzo Pitti in this city, which also contains a baptistery whose east doors were sculpted by Lorenzo Ghiberti and are known as the *Gates of Paradise*.

ANSWER: **Florence**, Italy [or **Firenze**, Italia]

<Painting/Sculpture>

6. A probably fictional story claims that a woman with this last name provided Dr. Joseph Warren with secret information that ultimately led to Paul Revere's midnight ride. For 10 points each:

[10m] Give this last name of the American-born Margaret. Margaret's husband with this last name, who succeeded Thomas Hutchinson as governor, was later replaced by William Howe as the commander of British forces.

ANSWER: **Gage** [accept Thomas **Gage**; accept Margaret Kemble **Gage**]

[10e] Thomas Gage commanded British forces during this conflict. Mary Ludwig Hays was one of the women during this conflict who became known as Molly Pitcher for providing water to soldiers.

ANSWER: **American Revolution** [accept American **Revolutionary** War; or **American** War of **Independence**; prompt on **Revolution**]

[10h] This Revolutionary War soldier took her husband's place during the Battle of Fort Mifflin. This soldier was the first woman to receive a military pension from Congress, receiving one decades before Deborah Sampson.

ANSWER: Margaret **Corbin** [or Margaret Cochran **Corbin**]

<American History>

7. In frogs, multiple malformed examples of these structures develop from a single “bud” that is split by eggs of the parasitic trematode *Ribeiroia ondatrae*. For 10 points each:

[10e] Name these structures that are disrupted in phocomelia caused by thalidomide (“thuh-LID-oh-myde”). In tetrapods, the ancestral Bauplan of these structures is pentadactyl, but they develop extra digits in polydactyly.

ANSWER: **limbs** [accept **arms** or **legs**; accept **hands** or **feet**; accept fore**limbs** or hind**limbs**; accept **limb** bud or **limb** field or **limb** disc; accept pentadactyl **limb**; accept **extremities**; accept **stylopod** or **zeugopod** or **autopod**]

[10h] The reaction-diffusion mechanism of limb formation is a “morphogenetic” kind of these factors, which include “physical” parameters and “phyletic” (“fai-LET-ik”) ancestral structures that bias or restrict evolution and cause gaps in morphospace.

ANSWER: **constraints** [or word forms like **constrained**; accept specific types, such as phyletic **constraints** or physical **constraints**; accept phylogenetic **inertia**; prompt on developmental **drive** or developmental **bias**]

[10m] Despite their constrained origins as an exaptation of the limb bud, turtle shells likely evolved varied shapes in a branching mode of speciation that is named for these groups and predominates in punctuated equilibrium, unlike gradualist bifurcation or anagenesis. Synapomorphies define these monophyletic groups.

ANSWER: **clades** [accept **cladogenesis** or **cladogenetic** speciation] (Specifically, turtle shells develop from a modification of the apical ectodermal ridge.)

<Biology>

8. This novel’s narrator is distressed by an empty room that she describes as “a violation of my quotation marks.”

For 10 points each:

[10h] Name this novel whose title character examines the empty room left by her maid, Janair; that title character in this novel then finds charcoal drawings of a man, a woman, and a dog scratched on the wall.

ANSWER: *The **Passion according to G.H.*** [or *A **Paixão Segundo G.H.***]

[10m] *The Passion according to G.H.* is by this author, who also wrote *Near to the Wild Heart* and depicted her country’s north-south divide in *The Hour of the Star*.

ANSWER: Clarice **Lispector** [accept Chaya Pinkhasivna **Lispector**]

[10e] The Ukrainian-born author Lispector mostly wrote in this country. Jorge Amado (“ZHOR-zhee ah-MAH-doo”), an author from this country, wrote novels like *Dona Flor and Her Two Husbands* in Portuguese.

ANSWER: **Brazil** [or **Brasil**; or Federative Republic of **Brazil** or República Federativa do **Brasil**]

<World Literature>

9. The British artist Nick Veasey depicted a Boeing 777 jet in the largest work ever in this medium. For 10 points each:

[10h] Name this medium used to depict the hands of European royalty in a craze that was sparked by an 1895 work in this medium that caused Anna Bertha Ludwig to remark, “I have seen my death.”

ANSWER: **X-ray** photograph [accept **radiograph**; accept **Röntgenogram**; accept descriptions of a **photo** taken with **X-rays**; prompt on a **photograph** by asking “in what specific medium?”] (Ludwig was the wife of Wilhelm Röntgen.)

[10e] While working under Rosalind Franklin, Raymond Gosling used X-ray diffraction to take “Photo 51,” which confirmed that this molecule has a double helix structure.

ANSWER: **DNA** [or **deoxyribonucleic acid**]

[10m] This artist predicted her death in the year 2000 to accompany the “modern feeling” of a series of X-ray photos of her. After teatime with Pablo Picasso, this Swiss Surrealist covered a tea cup and spoon in fur for a piece called *Object*.

ANSWER: Méret **Oppenheim** [or Meret Elisabeth **Oppenheim**]

<Other Fine Arts>

10. Doing this practice while coming “to Zion” titles a book by Sylvia R. Frey and Betty Wood that traces the foundations of the Black Baptist Church to 18th-century missions in Antigua, Jamaica, and Barbados. For 10 points each:

[10h] Name this practice used as a nickname for Yoruba-influenced Spiritual Baptists in Trinidad. This practice names a ritual in which enslaved African Americans stomped and clapped while moving counterclockwise in a ring. ANSWER: **shouting** [accept Ring **Shout**; accept **Shouters**; accept *Come **Shouting** to Zion*; prompt on vocalizations or making sounds or similar; prompt on yelling or screaming or similar; prompt on “the Frenzy”; reject “singing” or “music”]

[10m] The Hausa contrast the shouts of praise singers with these feminine vocalizations compared to guinea fowl cries. In much of East Africa, women express joy with these howl-like sounds made by rapidly moving the tongue and a hanging extension of the soft palate.

ANSWER: **ululations** [or word forms like **ululate**]

[10e] Ndau women ululated at a ruler’s house while he prepared for a makoto ceremony to induce this phenomenon. Nganga healers and Lobedu “queens” led seasonal rites analogous to Zuni “dances” to cause this natural phenomenon.

ANSWER: **rain** [accept **rainmaking**; accept **rain** dance; accept **rain** queens or **rain** kings; accept **rainstorms** or **thunderstorms**; prompt on weather]

<Religion>

11. Trường (“chwung”) Chinh and Nguyễn (“win”) Văn Linh adopted the market-based Đổi Mới reforms after the 1986 death of this leader, who expelled the Chinese Hoa (“hwah”) minority to Hong Kong and created New Economic Zones. For 10 points each:

[10h] Name this successor of Hồ Chí Minh as Vietnam’s general secretary, who oversaw the Cambodian-Vietnamese and Sino-Vietnamese wars. He shared his surname with a dynasty that nominally ruled Đại Việt from 1427 to 1789 despite Mạc opposition.

ANSWER: **Lê Duẩn** (“lay zwun”) [accept Later **Lê** Dynasty or Hậu **Lê** triều or Nhà Hậu **Lê** or Revival **Lê** Dynasty or Nhà **Lê** trung hưng or **Lê** trung hưng triều or **Lê** sơ triều or **Lê**-Mạc War or Chiến tranh **Lê**-Mạc; prompt on Duẩn]

[10m] Lê Duẩn (“lay zwun”) resisted the “Zone of Peace, Freedom, and Neutrality” proposed by this organization, which Vietnam and Laos joined in the 1990s. Brunei industrialized its gas fields after joining this economic union.

ANSWER: **ASEAN** (“AH-zee-ahn”) [or **Association of Southeast Asian Nations**]

[10e] After joining ASEAN (“AH-zee-ahn”), Malaysia, Indonesia, and especially the Philippines dominated world exports of oil and copra from this crop. The economies of Niue (“NYEW-ay”), Vanuatu, Tokelau, and Tuvalu rely on growing these fruits.

ANSWER: **coconuts** [or **Cocos**; accept **coconut** oil; prompt on palm trees]

<World History>

12. Answer the following about hijacked internet polls about musicians, for 10 points each.

[10e] In 2012, this Miami rapper really was “Mr. Worldwide” when he performed “Timber” at the remotest Walmart in the world in Kodiak, Alaska, due to a pranked poll.

ANSWER: **Pitbull** [or Armando Christian **Pérez**]

[10h] Justin Bieber’s “Our World” tour almost stopped in this home country of the Moran Hill Orchestra, which is experiencing a revival in “Enlightenment Music” based on its native trot genre. This country’s current leader is married to a former pop star and enjoys the Slovenian band Laibach (“LAI-bock”).

ANSWER: **North Korea** [or **Democratic People’s Republic of Korea** or **DPRK**; or **Chosŏn** Minjujuŭi Inmin Konghwaguk; prompt on **Korea**]

[10m] By poll, Austin, Texas renamed its garbage dump for this band’s vocalist, who frequently wears a red cap backwards. This band’s song “Rollin” appears on their album *Chocolate Starfish and the Hot Dog Flavored Water*.

ANSWER: **Limp Bizkit** (The garbage dump is the Fred Durst Society of Humanities and Arts.)

<Pop Culture>

13. Answer the following about Green’s functions, for 10 points each.

[10m] Green’s functions are used in this type of problem that tries to solve a differential equation with constraints that are named for Dirichlet (“dee-ree-klay”) or Neumann based on whether the solution or its derivative is specified.

ANSWER: **boundary value** problems [or **BVPs**; prompt on **boundary conditions** with “what is the name of the class of problems that specify boundary conditions?”; reject “boundary problems”]

[10e] For a Green’s function of x and “ x prime,” at x equals “ x prime,” the function must have this property, which is implied by differentiability. A function has this property if its graph can be drawn without lifting a pencil.

ANSWER: **continuous** [or **continuity**]

[10h] For inhomogeneous boundary conditions, Green’s function is first obtained for homogeneous boundary conditions, and then this technique is done twice to incorporate the boundary terms. The adjoint of an operator is found by using this technique to move the operator from one function to another in an inner product.

ANSWER: **integration by parts** [or **integrate by parts** or **integrating by parts**; prompt on **integration**]

<Other Science>

14. This poet claims, “Yet Isaac’s leaping from the Altar’s bed, / Foretold its glorious rising from the Dead,” in a poem meditating on the near sacrifice of Isaac. For 10 points each:

[10h] Name this poet whose poems have been described as “American Baroque” for their sometimes-puzzling diction and structure. This poet was completely unknown for 200 years before Thomas H. Johnson discovered his work in Yale’s library.

ANSWER: Edward **Taylor**

[10e] Edward Taylor was born in this century. The colonies’ literary output during this century largely consisted of Puritan writings, such as Cotton Mather’s reflections on the Salem witch trials.

ANSWER: **1600s** [or **17th** century]

[10m] In one of Taylor’s striking images, the speaker asks God to “soake [this thing] in Zion’s Bucking tub: / With Holy Soap.” Another reclusive New England poet wrote that this entity “shuts the Door — / To her divine Majority — / Present no more.”

ANSWER: the **soul** [accept my **soul**; accept “The **Soul** Selects Her Own Society”] (The other poet is Emily Dickinson.)

<American Literature>

15. Answer the following about the synthesis of Aztec beliefs with Catholicism in Mexico, for 10 points each.

[10e] Worship of the Aztec mother goddess Tonatzin on Tepeyac Hill may have inspired Saint Juan Diego's visions of this woman; that same hill houses a Catholic shrine containing a cloak that depicts this woman.

ANSWER: **Virgin of Guadalupe** [or **Virgen de Guadalupe**; or Our **Lady of Guadalupe** or Nuestra **Señora de Guadalupe**; accept **María Coatlalopeuh**; prompt on the Virgin **Mary** or **María** or **Our Lady** or **Nuestra Señora**]

[10m] The Aztec goddess Mictēcacihuātl ("meek-tay-kah-SEE-watl") may have influenced modern depictions of an unofficial saint who protects LGBTQ communities and sex workers in this form. Jose Posada's La Catrina also appears in this form.

ANSWER: **skeletons** [or word forms like **skeletal**; or **esqueletos**; accept **calaveras**; accept **skulls** or **cráneos**] (The unofficial saint is Santa Muerte.)

[10h] There have been reports of 19th-century dough rosaries made from this plant. The Spanish viewed Aztec ritual consumption of idols made from this plant and mixed with human blood as a perversion of the Eucharist.

ANSWER: **amaranth** [or **Amaranthus**; accept **pigweed**; accept **michihuahatl** or **tzoalli**]

<Mythology>

16. A series of courses in this city were funded by the Theater and Music Branch of the American Military Government and administered by Everett Helm. For 10 points each:

[10h] Name this city whose summer courses on contemporary classical music attracted composers like Luigi Nono and Brian Ferneyhough to its namesake "school."

ANSWER: **Darmstadt**, Germany [accept **Darmstadt** School; accept **Darmstädter** Ferienkurse]

[10m] During courses at Darmstadt, the musicologist Leo Schrade lectured on this "Americanist" composer's use of polytonality in pieces like his Second Piano Sonata. This composer's Second Symphony quotes "Camptown Races" and ends with a chord often likened to a blown raspberry.

ANSWER: Charles **Ives** [or Charles Edward **Ives**]

[10e] The Darmstadt school was criticized by Franco Evangelisti for having a sort of "police" enforcing this compositional technique. This technique is named for the number of pitches it employs and was popularized by Arnold Schoenberg's ("SHERN-berg's") use of tone rows.

ANSWER: **twelve-tone** technique [or **dodecaphony**; or **Zwölfton**technik; prompt on **serialism**]

<Classical Music>

17. The separation of these systems is typically assumed to be much smaller than the wavelength of their radiation. For 10 points each:

[10e] Name these systems that are idealized as two opposite point charges separated by a small distance.

ANSWER: electric **dipoles** [accept oscillating electric **dipoles**; reject "magnetic dipoles"]

[10m] Electric dipole fields can be assumed to fall off as "one over r -cubed" only in this theoretical region, defined by the distance from the dipole being much, much larger than the wavelength of the radiation. Diffraction intensity patterns in this theoretical region are predicted with Fraunhofer's simplification of the Fresnel-Kirchhoff integral.

ANSWER: **far field** [or **radiation zone**]

[10h] The 3D radiation pattern of an ideal radiating dipole resembles one of these solids. Transformers whose cores are these solids have lower mechanical hum, lower core losses, and smaller dimensions than other geometries.

ANSWER: **tori** [or **torus**; or **toroids**; accept **toroidal** transformers; accept **doughnut** shaped solids; accept **ring** shaped solids]

<Physics>

18. The creator of the term for these concepts developed them from notions of folk psychology regarding the beliefs and desires of rational agents. For 10 points each:

[10h] Name these levels of abstraction used to predict the behavior of a consciously perceived object that has been assigned agency. These concepts were formulated in a 1989 book titled for their most abstract, or “intentional,” level.

ANSWER: **stances** [accept *The Intentional Stance*]

[10m] This approach to philosophy originated the concept of intentionality that informed Daniel Dennett's concept of the “intentional stance.” This philosophical approach was developed by a student of Franz Brentano in texts like *Ideas* and *Cartesian Meditations*.

ANSWER: **phenomenology** [or word forms] (The student of Brentano was Edmund Husserl.)

[10e] Dennett named the middle stance between “physical” and “intentional” for this concept. In his writings on evolution, Dennett has dismissed a form of creationism known as the “intelligent” sort of this concept.

ANSWER: **design** [accept intelligent **design** theory; accept **design** stance]

<Philosophy>

19. A character in this play jumps up and down and shouts “oooooh!” while making “paw gestures,” prompting another character to ask her, “What makes you think you’re happy?” For 10 points each:

[10m] Name this play by the author of *The Entertainer*. This 1956 play focuses on the working-class Jimmy Porter and his middle-class wife Alison, who play “bears and squirrels” upon reuniting.

ANSWER: ***Look Back in Anger*** (by John Osborne)

[10e] Nora is belittlingly called a “little squirrel” by her husband Torvald, whom she later leaves by symbolically slamming the door in this Henrik Ibsen play.

ANSWER: *A **Doll's House*** [or *A **Doll House***; or *Et **dukkehjem***]

[10h] Squirrels frequently appear as portents of misfortune for the title character of this novel. This novel's protagonist recalls the death at Buchenwald of his former lover Mira Belochkin, whose last name means “squirrel.”

ANSWER: ***Pnin*** (“puh-NEEN”) (by Vladimir Nabokov)

<European Literature>

20. Helaine Silverman labels Site 165 as this culture's “urban” capital, in contrast to a “religious” capital that contains a “Room of Posts.” For 10 points each:

[10m] Name this culture located around the Ingenio Valley, which evolved from the Paracas culture according to Silverman. This Peruvian culture created *puquios* to irrigate terraces at sites like Cahuachi.

ANSWER: **Nazca** culture [or **Nasca** culture]

[10e] The Nazca traced large outlines of hummingbirds and spiders in this medium to create namesake lines that may be viewed from the air.

ANSWER: **earth** [accept **land**; accept **sand**; accept **rocks** or **stones**; accept **soil** or **dirt**; accept **ground**; accept **terrain**]

[10h] The Tiwanaku and this civilization centered in the Ayacucho Basin arose during the Middle Horizon period, after the decline of the Nazca. This civilization interacted with the Tiwanaku near the site of Cerro Baúl, where it built a hilltop settlement.

ANSWER: **Wari** culture [or **Huari** culture; accept **Wari** empire]

<Other History>

Extra. For 10 points each, answer the following about philosophy professor and novelist Rebecca Goldstein.

[10h] Goldstein is perhaps best known for arguing that “philosophy won’t go away” in a 2014 book titled for *Plato at this real-world location*, where Plato argues with a software engineer.

ANSWER: the **Googleplex** [accept **Google headquarters** or equivalents; accept *Plato at the **Googleplex***]

[10e] A literary treatment of philosophical issues is found in Goldstein’s novel centered on 36 arguments for this position. The ontological argument and the teleological argument are arguments for this theological position.

ANSWER: the **existence** of **God** [accept any answer indicating that **God exists** or **God is real**; accept *36 Arguments for the **Existence** of **God***]

[10m] In a 2006 biography, Goldstein argues that we must “betray” this philosopher whenever we yield to any human emotion. This philosopher’s magnum opus was inspired by Euclid’s “geometrical order” in its argument structure.

ANSWER: Baruch **Spinoza** [or Benedictus de **Spinoza**] (Spinoza’s magnum opus is *Ethics*.)

<Philosophy>