ACF Regionals 2017
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1. A form of music from this country can proceed in "colotomic" rhythmic cycles for as long as 256 beats. In this country, the German painter Walter Spies (VAHL-tur SHPEEZ) developed a fast, rhythmic, a cappella chant called *ketjak* (KET-yahk). Novices often perform a piece from this country called "Golden Rain," or "Udan Mas." Tempo flexibility in this country's music is evoked in the first movement of the piece *Estampes* (ess-TAHMP-uh). The scales *pelog* and *slendro* are used in music from this country, where ensembles often accompany *wayang* shadow-puppet shows. An 1889 performance of an ensemble from this country partially inspired Claude Debussy's use of the whole-tone scale and his musical piece "Pagodas." Gong-based ensemble music called gamelan is the traditional music of, for 10 points, what country's islands of Bali and Java?
ANSWER: **Indonesia** [or Republic of **Indonesia**; or Republik **Indonesia**]

2. A tradition of walking barefoot in the morning of this day stems from a line in a hymn stating "on our dryness pour thy dew." In the Middle Ages, rose petals would sometimes be scattered on this holiday from holes in church ceilings, from which a dove would also descend. This holiday derives its scriptural basis from a scene in which a crowd of 3,000 people comes together after a sermon about King David's prophecies. This holiday is based on a scene in the second chapter of the Acts of the Apostles in which Galilean, Parthian, Ephesian, Latin, and hundreds of other languages are spoken by worshipers who are "filled with the Holy Spirit." The birth of the church is traditionally celebrated on, for 10 points, what holiday named for the fact that it falls on the 50th day after Easter?
ANSWER: **Pentecost** [accept **Whitsunday**]

3. A character in this novel develops a philosophy "trampl[ing] on the past" and "crush[ing] it" after returning from England. Father Huismans (wee-mahn), a Belgian priest at a *lycée* (lee-SAY), teaches Ferdinand, who befriends this novel's protagonist while staying with Raymond and Yvette. A servant whose name, Metty, means "someone of mixed race" works for the protagonist of this novel, who takes a native lover named Zabeth. This novel's protagonist gets engaged to Nazruddin's daughter and becomes disillusioned at its end while nominally heading "The Domain." Indar is a childhood friend of this novel's protagonist, a businessman named Salim. An African dictator named the "Big Man" appears in, for 10 points, what V. S. Naipaul novel titled for the geographic location of the central town?
ANSWER: A ***Bend in the River***

4. The multiplicity function gives the mass fraction in these structures in Press–Schechter theory. In linear tidal torque theory, angular momentum acquisition first occurs in "proto" examples of these structures. In *N*-body simulations, the "virial mass" and "concentration parameter" determine the density profiles of these structures, as demonstrated by Navarro, Frenk, and White. These structures are often defined as having a density 200 times the critical density. In the standard model, galaxy formation originates from their "dark matter" type. Globular clusters and metal-poor stars mainly constitute the region of a spiral galaxy, surrounding the disk, that's denoted by this term. For 10 points, the "galactic" type of what structure is named in analogy to the faint and diffuse light around the head of a saint?
ANSWER: **halo**s [accept dark matter **halo**s or galactic **halo**s; accept **overdensities** or **overdensity** before "200"; prompt on "**galaxies**" or "**galaxy**" before "galaxy"]

5. After the sinking of the *Vyner Brooke*, 21 members of this profession were massacred by Japanese troops on Bangka (bahng-kah) Island. After being trained in this profession in England, Henny Tscherning ("CHAIR"-ning) brought modern pedagogical methods in this profession to Denmark. Traugott von Sauberzweig ("TROW"-got von ZOW-berts-vyge) was removed from his position as military governor of Brussels after ordering the execution of one of these people named Edith Cavell. A group of these people called the Angels of Bataan continued to perform their duties as prisoners of war in the Philippines. A woman in this profession, who invented the "polar area diagram" to chart causes of mortality, worked at the Scutari barracks during the Crimean War. For 10 points, name this profession of "The Lady with the Lamp," Florence Nightingale.
ANSWER: **nurse**s [accept **nursing** profession or answers such as army **nurse**s or battlefield **nurse**; prompt on "**medic**s" or similar answers; do not accept or prompt on "doctors" or similar answers]

6. Completing the single-player mode of this game can result in a screen showing the player's character stuck inside a wooden frame with the message "you are great," when the player uses the only character that has a unique shield. In single-player mode, this game includes "bonus" levels in which the player "races to the finish," "boards the platforms," and "breaks the targets." Enemies in this game's single-player mode include a "giant" with three allies, a very heavy "metal" character, and a team of 30 "fighting polygons." The single-player part of this game ends with the player's character appearing in the form of a plush doll after depleting the 300 HP of the "Master Hand." For 10 points, name this Nintendo 64 game, the first in a series of fighters featuring characters such as Link and Mario.
ANSWER: **_Super Smash Bros._** [or **_Nintendo All Star! Dairanto Smash Brothers_**; or **_Nintendo Oru Suta! Dairanto Sumasshu Burazazu_**; accept **_Super Smash Bros._ 64** or answers mentioning **_Super Smash Bros._** and Nintendo 64 or N64; accept answer such as **_Super Smash Bros._ 1** or **First _Super Smash Bros._**]

7. In a story from this text, a baker kills the lover of a fuller's wife by forcing him into a cage covered in sulfur-soaked clothes. During a mock trial staged in a theater, the protagonist of this text learns that three men whom he killed were actually blown-up wineskins; that episode is referenced in "The Curious Impertinent" from *Don Quixote,* which likely took its use of inset tales from this text, whose own insets include "Tale of the Murderous Wife" and Aristomenes's story of Socrates's heart being replaced by a sponge. Robert Graves made a 1950 translation of this text. The earliest account of the Cupid and Psyche myth is found in this text. In its eleventh and final book, Lucius joins the cult of Isis, which allows him to become human again. For 10 points, name this Roman novel by Apuleius (a-poo-LAY-us).
ANSWER: The **_Golden Ass_** [or **_Asinus aureus_**; accept The **_Transformations of Lucius_** or similar translations; accept answers mentioning **_Metamorphoses_** and **Apuleius**; do not accept or prompt on just "*Metamorphoses*"]

8. P. W. Anderson showed that, when the disorder potential is too strong, interference of a wavefunction with itself results in this type of material. Because of correlation effects, an example of these materials occurs when the on-site repulsion is much greater than the inter-site hopping, which are the two terms in the Hubbard model. In the simplest possible MOSFET ("MOSS"-fet), this type of material underlies the gate terminal. In general, these materials are characterized by a very high bandgap, often over four electron volts. If these materials can be polarized by an electric field, as are often found in capacitors, they are called dielectrics. For 10 points, name these materials with tightly bound electrons in which current does not flow, as contrasted with conductors.
ANSWER: electrical **insulator**s [prompt on "**dielectric**s" before "dielectrics"]

9. A 1999 book cataloguing the "languages" of this continent was written by Marianne Mithun. Polysynthetic words consisting of a single long cluster of obstruent consonants are characteristic of this continent's Salishan language family. Several language families on this continent use classificatory verbs, and it also contains most of the world's languages that use voiceless alveolar lateral fricatives. The most widely used alternative to the International Phonetic Alphabet was developed to describe the languages of this continent, which were divided into six families by Edward Sapir. The alleged difficulty of a language in this continent's Na-Dene family led to its use by code talkers during World War II. For 10 points, what continent's native languages include Hopi and Navajo?
ANSWER: **North America** [accept The **_Languages of North America_**]

10. This body of water occupies the only surviving fragment of the Dura-Europos route map, which was drawn onto the leather portion of a Roman shield. A region on this body of water was home to Alexander of Abonoteichus (ah-boh-no-"TYKE"-us), the prophet of a cult believing that Asclepius was reborn as the snake god Glycon. Arrian of Nicomedia wrote a periplus of this body of water, which was known as the Euxine (YOOK-seen) Sea in antiquity. Paphlagonia and Bithynia (bih-THIH-nee-ah) were regions on this sea. In Xenophon's *Anabasis*, this sea is greeted with the cry "thalatta! thalatta!" by the Ten Thousand as they approached the city of Trebizond. On the southern coast of this sea, a number of kings named Mithridates (mih-thrih-DAH-tees) ruled a region called Pontus. For 10 points, what sea borders the historical regions of Colchis and Crimea?
ANSWER: **Black Sea** [accept **Euxine** Sea before "Euxine"; accept **Black** Sea after "sea"; prompt on "Black" before "sea"]

11. One of these figures wears a fur hat in a painting depicting a fight over a pickled herring. The phrase "no fire; will you have any tomorrow?" appears on a stove around which several of these figures "warm themselves." In another painting, two of these figures form an equilateral triangle with a man wearing a sign that reads "civet" (sih-VAY). One of these figures is depicted through a window in the distance under the letters S and O on a banner that reads "vive le sociale." Two of them are shown with a mop and broom "fighting for the body of a hanged man." One of these figures wears a black-and-green top hat at the bottom left of *Christ's Entry into Brussels*. James Ensor often painted, for 10 points, what figures that, in Pieter Bruegel's *The Triumph of Death*, attack the living with their bony limbs?
ANSWER: **skeleton**s [prompt on "corpses" or "bodies" or "bones" or "dead people" or similar answers]

12. A text from this school of thought contains the story of a man who picks up a skull on the roadside, uses it as a pillow, and converses about death with it in his sleep. In another story from this school of thought, a man whose wife just died is found happily drumming on a bowl. The "Inner Chapters" are found in a text from this school of thought; another text from this tradition claims that the only important motion is "returning" and notes that a pot is useful because of its emptiness. This school of thought uses the metaphor of an uncarved wooden block to represent human nature. The concept of "action through inaction," or "wu wei" ("woo way"), is central to, for 10 points, what Chinese school of thought based on the teachings of Zhuangzhi and Laozi (JWANG-zuh and "LOUD"-zuh), the latter of whom wrote the a book whose title translates as "The Book of the Way of Virtue"?
ANSWER: **Tao**ism [or **Dao**ism; accept forms of the words **Tao** or **Dao**]

13. Natty encourages the protagonist of a novel by Andrew Motion to follow in his father's footsteps by taking this document from under his father's bed. In the essay "My First Book," the creator of this document wrote that it served as "a mine of suggestion" and generated most of the plot of the novel in which it appears. Along with a log recording various sums of gold, this document is rescued from the henchmen of the blind Pew by a boy who wraps it in an oilcloth and removes it from his father's inn. This document depicts Spyglass Hill and bears the monograph of John Flint. It launches Squire Trelawney, Jim Hawkins, and many pirates on a voyage in search of riches. For 10 points, what document from a Robert Louis Stevenson novel contains a red 'X' marking the site of buried loot?
ANSWER: **map** of **Treasure Island** [or **map** from **Treasure Island**; accept Captain John **Flint**'s **map** before "Flint"; prompt on "map" or "treasure map"; prompt on "Captain John Flint's map" after "Flint"]

14. A poem criticizing this government program declares that "the millet is scattered over the ground, the leaves of the sweet potato are withered," which was used as evidence to fire a defense minister. A fake photo circulated by the government as part of this program appeared to show a wheat field supporting the weight of several children. Jasper Becker highlighted foreign news coverage of this program's deadly aftermath in his book *Hungry Ghosts*. The effects of this program were exacerbated by the extermination of sparrows, which were labelled one of the "Four Pests." As part of this program's focus on steel production, household utensils were melted down in backyard furnaces. For 10 points, what program started in 1958 and attempted to rapidly modernize the economy of China?
ANSWER: **Great Leap Forward** [or **dà yuè jìn**; accept **Great Leap Forward** Famine; prompt on the "Great Chinese Famine" or "Three Years of Difficulty"]

15. This quantity and the second virial coefficient can be estimated by extrapolating a Zimm plot to "theta equals zero." The Mark–Houwink ("mark"-OW-ink) equation sets viscosity to be a power law in this quantity. The Z-average is the third moment of this quantity's distribution. Low-angle laser light scattering, a version of DLS, measures the distribution in this quantity. In membrane osmometry (oz-MOM-eh-tree), it equals "concentration over osmotic pressure times RT." The polydispersity index is the ratio of the two forms of this quantity: weight-average and number-average. Gel permeation chromatography, a type of SEC used for polymers, measures this quantity that, for biopolymers, is given in kilodaltons. For 10 points, what property, proportional to a polymer's length, is often measured in grams per mole?
ANSWER: **molecular weight** [or **molar mass**; or **molecular mass**; or number-average **molecular weight**; or weight-average **molecular weight**; or **molecular weight** distribution; prompt on M; prompt on mass; prompt on weight; prompt on size; prompt on length]

16. A current exhibition at the Metropolitan Museum of Art projects a film of one of this choreographer's ballets alongside the Andrews decorative arts collection; in that ballet, this choreographer had background dancers hold the hat of a character who crawls around on all fours and mimics praying. After commissioning a ballet with Elizabeth Sprague Coolidge, this choreographer suggested a title taken from a Hart Crane poem. This wife of dancer Erik Hawkins choreographed a ballet that ends with a married couple holding hands over a rocking chair; Merce Cunningham played a preacher in that ballet, which used sets designed by this woman's frequent collaborator Isamu Noguchi. For 10 points, what woman choreographed Aaron Copland's *Appalachian Spring*?
ANSWER: Martha **Graham**

17. Italo Calvino's essay on "Lightness" illustrates the title concept by using Ovid's account of how a hero placed this object on a bed of leaves and underwater plants to protect it from rough sands. This object contained a liquid that created the amphisbaena (am-fis-"BYE"-nah), an ant-eating creature that had heads on each end of its body. A man was sent to retrieve this object after failing to supply a horse for Hippodamia's ("hippo"-DAH-mee-ah) wedding. This object, which was carried in a wallet called a *kibisis*, was used to stop Phineus from disrupting an Ethiopian princess's wedding feast. This object was mounted onto Athena's *aegis* (EE-jis) shield after it was obtained using Hermes's winged sandals and a reflective shield. For 10 points, what object, severed by Perseus from the body of a Gorgon, had the power to turn people into stone?
ANSWER: **head** of **Medusa** [accept answers mentioning **Medusa** and the idea of **head** or **face** or **hair**; prompt on "body of Medusa" or similar answers]

18. In a play by this author, a man describes how his father could walk into a barbershop and be treated like a "big man"; in that play by this author, Youngblood tells his girlfriend Rena that, instead of "running around" with her sister, he has been looking for a house with which to surprise her. A play by this man ends with Booster answering a phone with the words "car service" in honor of his late father, Becker, who owned a gypsy cab station. This author of *Jitney* wrote a play in which Gabriel cannot produce sound from his trumpet but manages to open up the heavens by dancing; in that play by this man, Cory joins the marines after his father, a former baseball player, refuses to let him play college football. For 10 points, what playwright wrote about the garbage man Troy Maxson in his play *Fences*?
ANSWER: August **Wilson**

19. A group of nouveau riche merchants in Glasgow, Scotland, who primarily traded this crop were referred to as its "lords." An increase in the price of this crop led a legislature to pass the Two Penny Act, which angered Anglican clergymen like James Maury who received their salaries in this crop. This crop was experimentally grown across the river from Henricus at Varina Farms. The high human capital requirements of this crop led to the implementation of the headright system. A cultivator of this crop used his newfound wealth to sail to England, where he introduced his wife as "Rebecca." This crop was introduced to a colony after the Starving Time by the man who married Pocahontas, John Rolfe. For 10 points, what crop is still cultivated in Virginia by such companies as Marlboro?
ANSWER: **tobacco** [accept *Nicotiana* or *Nicotiana tabacum* or *N. tabacum* or *Nicotiana rustica* or *N. rustica*]

20. Because it has a low isoelectric point, a protein that regulates this process by binding XIAP is named DIABLO. This process populates the top-right quadrant of a propidium iodide–gated flow cytometry assay. A protein complex named for this process looks like a seven-spoked wheel. Proteins that regulate this process in *C. elegans* ("see" eh-leh-GANZ) are prefixed "c-e-d." DNA extracted during this process runs like a ladder on a gel because it is fragmented. Trophic factors prevent this process; a protein that also prevents this process is upregulated in lymphoma, opposes Bax and Bad, and prevents cytochrome C from escaping the mitochondria. Cell membranes bleb, and caspases degrade proteins, during this process. DNA damage detected by p53 can trigger, for 10 points, what process of programmed cell death?
ANSWER: **apoptosis** [prompt on "(programmed) cell <u>death</u>"]

TB. In a play, a man with this job encourages people to memorize an anecdote about how 14 foreskins of Christ existed at the time of the Reformation; in that play, Dakin (DAY-kin) blackmails Felix Armstrong to help a man keep his job in this profession, but that man dies in an accident while riding his motorcycle with Irwin. In another play, a woman in this profession falls in love with the one-armed veteran Teddy Lloyd and is betrayed by Sandy Stranger, who gets her fired by exposing her fascist sympathies; that Edinburgh resident with this job tries to shape Sandy, Monica, Jenny, Eunice, Rose, and Mary into the *crème de la crème*. Hector in Alan Bennett's *The History Boys* holds, for 10 points, what job also held by Muriel Spark's Jean Brodie, who works at the Marcia Blaine School for Girls?
ANSWER: school**teacher**s [accept answers mentioning forms of the word **teach** such as **teaching**; accept equivalents such as **educator**s or **instructor**s; accept specific answers such as boys' school **teacher**s or girls' school **teacher**s]

1. This character's passions include playing the *santuri*, getting very drunk, and making fun of his business partner. For 10 points each:
[10] Name this man, a partner in a coal mine and a timber railway with a man he calls "boss." The narrator is incensed when this man seduces the hotel owner Madame Hortense.
ANSWER: **Alexis** **Zorba** [accept either underlined portion]
[10] Zorba hails from this modern-day country, the homeland of the author who created him, Nikos Kazantzakis.
ANSWER: **Greece** [accept **Hellenic Republic** or **Hellas**]
[10] Kazantzakis's novel *Captain Michalis* was published in Britain under a title containing these two English-language nouns, which are a translation of a motto from the Greek War of Independence.
ANSWER: **freedom** and **death** [accept in either order; accept ***Freedom and Death*** or "**freedom or death**"]

2. The founder of this approach, Norbert Wiener, defined it as "the science of control and communication in the animal and the machine." For 10 points each:
[10] Name this transdisciplinary approach to understanding self-regulating information systems that attempts to observe the passage and feedback of information.
ANSWER: **cybernetics** [accept **cybernetic** theory or similar answers]
[10] Cybernetics proponent Gregory Bateson attended the Macy conferences on cybernetics with this woman, his wife, who wrote the anthropological study *Coming of Age in Samoa*.
ANSWER: Margaret **Mead**
[10] This ecological anthropologist coined the term "cybernetics of the holy" in his study of rituals. He observed a Papuan pig feast's role in maintaining homeostasis in the surrounding ecosystem in his book *Pigs for the Ancestors*.
ANSWER: Roy **Rappaport** [or Roy A. **Rappaport**]

3. In a book about the "politics" of the trade in this crop, Alfred McCoy alleges that the CIA secretly trafficked in it through the dummy airline corporation Air America. For 10 points each:
[10] Name this crop that is extensively cultivated in the Golden Triangle of Southeast Asia.
ANSWER: **opium** poppy or poppies [or ***P. somniferum***; or ***Papaver somniferum***; prompt on "poppies" or "poppy"]
[10] Southeast Asia is also a major producer of this staple food, often grown on flooded paddy fields.
ANSWER: Asian **rice** [or ***Oryza sativa***; or ***O. sativa***]
[10] Rather than cultivating rice or opium, residents of this subregion of Southeast Asia practice slash-and-burn "escape agriculture." This upland region, which James C. Scott's *The Art of Not Being Governed* reified as a distinct place, has historically been difficult for governments to control.
ANSWER: **Zomia**

4. This proposition states that a string in a regular language can be divided into three substrings, *x*, *y*, and *z*—where *y* is not the empty string—and that a string in the same language can be composed of "*x*," "*y* repeated some number of times," and "*z*." For 10 points each:
[10] Name this statement often used in proofs by contradiction to demonstrate that a language is not regular.
ANSWER: **pumping** lemma
[10] The pumping lemma was introduced in Michael Rabin and Dana Scott's seminal paper titled for "finite" examples of these things and their decision problems. The study of these abstract models of machines is a major branch of theoretical computer science.
ANSWER: finite (state) **automata** [or finite (state) **automaton**; accept deterministic finite (state) **automata** or nondeterministic finite (state) automata or D**FA**s or N**FA**s or finite **state machine**s or F**SM**s; prompt on "machines"]
[10] The basis for the pumping lemma is this counting argument, which states that storing more than *x* objects in *x* containers means that some container must have more than one object.
ANSWER: **pigeonhole** principle [or **Dirichlet's box** principle; or **Dirichlet's drawer** principle; do not accept or prompt on "Dirichlet's principle"]

5. An event hosted by the second ruler of this name came to be known as the Black Dinner because two of his guests, the Earl of Douglas and his younger brother, were brutally murdered. For 10 points each:
[10] Give this name that was held by seven different Scottish monarchs, all from the house of Stuart. The sixth holder of this name succeeded Elizabeth I to the throne of England.
ANSWER: **James** [accept **James** of Scotland or a specific **James** between I and VII]
[10] At this 1513 engagement, James IV became the last king from the British Isles to die in battle. In this battle, the Earl of Surrey's vastly outnumbered army repulsed the Scottish invaders while Henry VIII was fighting abroad.
ANSWER: Battle of **Flodden** Field [accept Battle of **Branxton**]
[10] As part of James IV's naval development program, he commissioned this massive carrack. At twice the size of the English *Mary Rose*, this warship was the largest in Europe until it was outdone by the *Henry Grace à Dieu* ("Henry" grahs ah dyoo).
ANSWER: *Michael* [or *Great Michael*]

6. Of the 16,000-plus men to begin a journey from this city, only assistant surgeon William Brydon survived to reach Jalalabad (juh-LAHL-uh-bad). For 10 points each:
[10] Name this city from which Lord Elphinstone led a disastrous retreat in 1842. In modern times, the Saur (SAH-wur) Revolution ended after Sardar Daud Khan was assassinated in this capital city.
ANSWER: **Kabul**
[10] Kabul is the capital of this country, which Britain and Russia fought to influence in the so-called "Great Game."
ANSWER: **Afghanistan** [or Islamic Republic of **Afghanistan**; or Da **Afganistan** Islami Jumhoryat; or Jomhuriyyeh Eslamiyyeh **Afganestan**]
[10] Lord Elphinstone's army was betrayed by Wazir Akbar Khan, an Afghan emir from this dynasty who promised them safe passage. This dynasty ruled Afghanistan until 1973, when Mohammed Zahir Shah was overthrown by Sardar Daud Khan.
ANSWER: **Barakzai** dynasty [accept the **Barakzais**; prompt on "Sons of Barak"]

7. The matriarch of this family is seen rocking a cradle in the painting *La Berceuse* ("bear"-koos). For 10 points each:
[10] Name this family whose members were repeatedly painted in the winter of 1888. They include the postman and patriarch Joseph and his son Camille, who was frequently depicted wearing a blue cap.
ANSWER: **Roulin** family [accept the **Roulins**]
[10] The Roulin family portraits were executed by this artist, who also painted a *Portrait of Doctor Gachet* (gah-SHAY) and *The Potato Eaters*.
ANSWER: Vincent **van Gogh** [or Vincent Willem **van Gogh**]
[10] Vincent van Gogh painted the Roulin family and Doctor Gachet while staying in this city, where he lived in the Yellow House with Paul Gauguin.
ANSWER: **Arles**, France (ARL or AR-luh)

8. In 1983, the decision of who to give this award to was decided by Fay Weldon, who changed her mind in the middle of a phone call. For 10 points each:
[10] Name this annual literary prize that was previously restricted to writers from Commonwealth countries, Ireland, South Africa, and Zimbabwe but is now open to all English-language fiction.
ANSWER: **Booker** Prize [or Man **Booker** Prize for Fiction; accept **Booker**-McConnell Prize]
[10] This man is the most recent winner of the Booker Prize and the first American winner. His first novel, *The White Boy Shuffle,* was published 19 years before his Booker-winning novel, *The Sellout.*
ANSWER: Paul **Beatty**
[10] The protagonist of *The Sellout* is referred to by this word, his last name. This character's antics include reintroducing slavery and segregation in Los Angeles in order to grow marijuana and watermelons.
ANSWER: **Me**

9. The thermodynamic square was popularized by Frederick Koenig but first devised by this person. For 10 points each:
[10] Name this German physicist who devised a cyclic process with Fritz Haber to calculate the lattice energy of ionic compounds.
ANSWER: Max **Born** [accept **Born**–Haber cycle]
[10] The corners of the thermodynamic square contain conjugate variables, so if temperature is at the top right, what quantity is at the bottom left?
ANSWER: **entropy** [or **S**; accept −**S** or negative **entropy**]
[10] This quantity is defined as the "reciprocal of volume" times the "partial derivative of volume with respect to temperature at constant pressure." The "partial derivative of pressure with respect to temperature at constant volume" gives the ratio of the "coefficient of isothermal compressibility" to this quantity.
ANSWER: coefficient of **thermal expansion** [accept **alpha**]

10. After dreaming of a golden hawk flying toward Egypt, the prince of Bekhten returned a statue of this god to Ramses II, who had lent it to the prince to cure his possessed daughter. For 10 points each:
[10] Name this Egyptian lunar god, a son of Amun and Mut. This hawk-headed god was associated with baboons and healing, just like a similar ibis-headed lunar deity.
ANSWER: **Khonsu** [or **Khensu**; or **Chonsu**; or **Khons**; or **Chons**; or **Khonshu**]
[10] This aforementioned ibis-headed god established the 365-day calendar by winning a game of dice against Khonsu, which he did in order to purchase time during which Nut could give birth. This god of wisdom also invented writing.
ANSWER: **Thoth** [or **Djehuti**]
[10] This bird-headed god ruled over the Memphite necropolis, a role in which he was syncretized with the chief god of Memphis, Ptah, and the god of the dead, Osiris. His name may come from a phrase meaning "hurry to me."
ANSWER: **Sokar** [or **Seker**; accept any combinations of **Sokar** or **Seker** and "Ptah" and/or "Osiris"]

11. Some species of dinoflagellates will exhibit this phenomenon upon a shear stress. For 10 points each:
[10] Name this common biochemical phenomenon demonstrated by organisms such as fireflies and anglerfish that express the enzyme luciferase (loo-SIH-fer-"ace").
ANSWER: bio**luminescence** [accept making **light** or similar answers]
[10] Bioluminescence is an example of a trait that underwent this type of evolution, in which disparate species evolve a similar trait without a common ancestor possessing it. Another example of it is flight in birds and insects.
ANSWER: **convergent** evolution [or **convergence**; or **homoplasy**]
[10] On phylogenetic trees constructed with maximum parsimony, traits that underwent convergent evolution cause this error, in which two evolutionarily distant species are juxtaposed because they converged on the same mutation.
ANSWER: **long branch attraction** [accept **LBA**]

12. For 10 points each, answer the following about the harmonic theories of Jean-Philippe Rameau.
[10] Thomas Christensen has characterized Rameau as representative of this intellectual movement of the 18th century. Rameau held court with many of this movement's *philosophes*, including Jean d'Alembert (zhahn DAH-lum-"bare") and Denis Diderot (duh-NEE DEE-deh-row).
ANSWER: **Enlightenment** [or French **Enlightenment**; or Le **siècle des lumières**]
[10] Rameau's theory of the "fundamental bass" helped explain why chords can appear in these different positions. A C-major triad with an E in the bass is in the "first" of two numbered examples of these positions.
ANSWER: **inversion**s
[10] Rameau also hypothesized that all "correct" dissonances derive from these non-chord tones, which arise when a note from the previous chord is held into or played against the next chord.
ANSWER: **suspension**s

13. The namesake of this holiday died after her brother Prahlada prayed to Vishnu to keep himself safe. For 10 points each:
[10] Name this Hindu spring festival that celebrates the death of the evil daughter of King Hiranyakashipu (hee-rahn-YAHK-ah-shih-pooh). During this holiday's Festival of Colors, people throw dye or colored powder at each other.
ANSWER: **Holi** [accept **Holika** Dahan or Chhoti **Holi** or Ranwali **Holi** or **Dhuleti** or **Dhulandi** or **Dhulivandan**]
[10] Holi begins with the creation of one of these things, commemorating Holika's death, which occurred after she tricked Prahlada into sitting on her lap atop one of these things.
ANSWER: **fire** [or **bonfire**; or **pyre**; accept equivalents that convey the idea of **burn**ing]
[10] This half-man, half-lion avatar of Vishnu answered Prahlada's prayers, saving him from the bonfire of Holika and eventually killing Hiranyakashipu.
ANSWER: **Narasimha** [or **Narasimh**; or **Narsingh**; or **Narasingh**; or **Narasingha**]

14. This author imagined the past hundred years collapsing "into a pile / of mirrors or buttons or frivolous shoes" in a poem about spending the "final / minutes of the 20th century" dancing "slowly with you." For 10 points each:
[10] Name this poet of "Dancing toward Bethlehem" who discussed the suddenness of death and how the "heart, no valentine, / decides to quit after lunch" in the title poem of his collection *Picnic, Lightning*.
ANSWER: Billy **Collins** [or William James **Collins**]
[10] Collins's "Japan" discusses reciting one of these poems, stating that "when I say it to you in the dark, you are the bell, and I am the tongue of the bell, ringing you." These three-line poems have a 5-7-5 syllabic structure.
ANSWER: **haiku**
[10] This American poet was inspired by haiku to write "In a Station of the Metro," a poem that consists entirely of the sentence "the apparition of these faces in the crowd; / petals on a wet, black bough."
ANSWER: Ezra **Pound** [or Ezra Weston Loomis **Pound**]

15. This politician sponsored a namesake amendment that, if ratified, would have prohibited tax funds from going to religious schools. For 10 points each:
[10] Name this Half-Breed politician whom Robert Ingersoll nicknamed the "Plumed Knight." His reputation was tarnished by the Mulligan letters, which implicated him in a railroad bribery scandal.
ANSWER: James G. **Blaine** [or James Gillespie **Blaine**]
[10] Though ostensibly affecting all religions, the Blaine Amendment targeted this specific religious denomination. Nativists feared Irish and Italian immigrants because they mostly belonged to this denomination.
ANSWER: Roman **Catholic** Church [accept word forms such as Roman **Catholic**ism; accept **papist**ry or **Romanism**]
[10] Supporters of the Blaine Amendment circulated a Thomas Nast cartoon that depicted Catholic bishops as crocodiles menacing frightened children and that was titled for the "American" version of this river.
ANSWER: **Ganges** River [accept **Ganga** or "The **American River Ganges**"]

16. Name these products of reactions involving methyl chloride, for 10 points each.
[10] In a Finkelstein reaction, the chlorine could be exchanged with this next-heaviest halogen, which is a better nucleophile. Like mercury, this halogen is a liquid at room temperature.
ANSWER: **bromine** [or **Br**]
[10] Reacting methyl chloride with (read slowly) potassium phthalimide (THAL-ih-mide), then hydrazine, and then a base produces one of these organic compounds. These compounds react with carbonyls to make Schiff bases.
ANSWER: **amine**s (This reaction is the Gabriel synthesis.)
[10] Methyl chloride won't easily undergo de·hydro·halogen·ation, but using a strong enough base will perform an alpha elimination and produce this simple carbene. This compound is added to a ketone by Tebbe's (TEH-bee's) reagent.
ANSWER: **methylene** [or CH_2]

17. Answer the following about Noah Baumbach's film *Frances Ha*, for 10 points each.
[10] A sequence in the film in which the protagonist runs down a crowded city sidewalk, excitedly performing leaps and twirls, is set to this artist's song "Modern Love." The soundtrack to the Wes Anderson and Noah Baumbach film *The Life Aquatic* is made up of this man's songs sung in Portuguese.
ANSWER: David **Bowie** [or David Robert **Jones**]
[10] The "Modern Love" sequence from *Frances Ha* pays tribute to a similar sequence in this French director's film *Mauvais Sang* (moh-VAY SAHNG). This man collaborated with actor Denis Lavant (deh-NEE lah-VAHN) on *Les Amants du Pont-Neuf* (lays ah-MAHNTS du pont-NOOF) and *Holy Motors*.
ANSWER: Leos **Carax** [or Alex Christophe **Dupont**]
[10] *Frances Ha* was filmed in black and white, a choice inspired by cinematographer Gordon Willis's use of black and white for this director's *Manhattan*. This director's recent films include *Midnight in Paris* and *Café Society*.
ANSWER: Woody **Allen** [or Allan Stewart **Konigsberg**]

18. With Heinrich Bullinger, two theologians based in this city drafted the *Consensus Tigurinus* (tih-goo-REE-nus), which attempted to bring unity to the various Protestant churches. For 10 points each:
[10] Name this Swiss city where Michael Servetus was burned at the stake in 1553 for denying the trinity. This city's Libertine faction included Ami Perrin (ah-MEE peh-RAHN), who staged a failed coup against its most influential ecclesiastical leader.
ANSWER: **Geneva** [or **Genève**; or **Genf**; or **Genevra**]
[10] This theologian led the Protestant Reformation in Geneva after he was recruited by William Farel (fah-REL). This author of *Institutes of the Christian Religion* included predestination as a central tenet of his theology.
ANSWER: John **Calvin** [or Jean **Calvin**; or Jehan **Cauvin**]
[10] This annual festival in Geneva celebrates the failure of a night attack by Charles Emmanuel I, Duke of Savoy. Its name refers to the fact that many of the Savoyard troops tried to climb over the city walls.
ANSWER: *L'**Escalade*** [or *Fête de l'**Escalade***]

19. This philosopher believed that "actual entities" that most people hold to be concrete objects are actually temporal things comprising indefinitely many units known as "occasions of experience." For 10 points each:
[10] Name this philosopher who called his metaphysics a "philosophy of organism."
ANSWER: Alfred North **Whitehead**
[10] Whitehead collaborated with this British philosopher on *Principia Mathematica*. This man's namesake paradox concerns the set of all sets that do not contain themselves.
ANSWER: Bertrand **Russell** [or Bertrand Arthur William **Russell**]
[10] Whitehead's conception of "occasions of experience" drew inspiration from these units, which a German philosopher defined as "windowless" entities that causally interact with each other in a pre-established harmony.
ANSWER: **monad**s

20. The cover art of this singer's album *Songs after Dark* shows her wearing a purple satin dress and sitting on a barstool with a cigarette in her hand, possibly in South America because "there are palms behind her." For 10 points each:
[10] Name this singer who recorded the music on a cassette tape owned by Kathy. After Madame sees Kathy dancing with a pillow to one of this woman's songs, the cassette tape goes missing.
ANSWER: **Judy** **Bridgewater** [accept either underlined portion]
[10] Kathy is the narrator of *Never Let Me Go*, a novel by this Japanese-born British author. He won the Booker Prize for his 1989 novel *The Remains of the Day*.
ANSWER: Kazuo **Ishiguro**
[10] This protagonist of *The Remains of the Day* is the butler at Darlington Hall. This man drives out to meet a former colleague named Miss Kenton, only to learn that she is happy with her married life as Mrs. Benn.
ANSWER: **Stevens**

Extra. An Atwood machine consists of two masses connected by an ideal, massless one of these devices. For 10 points each:
[10] Name these simple machines that consist of a wheel on an axle, usually with a groove for a rope.
ANSWER: **pulley**s
[10] Consider an ideal, frictionless Atwood machine with mass m2 larger than mass m1. Acceleration times the quantity "m1 plus m2" equals the acceleration due to gravity times what quantity? Be sure to get the signs right.
ANSWER: mass **m2 minus** mass **m1** [or obvious equivalents, such as **minus m1 plus m2**]
[10] The previous bonus part relies on Newton's second law, which is only valid in inertial reference frames. What named transformation transforms between reference frames in Newtonian physics?
ANSWER: **Galilean** transformation(s)