

2021 ACF Nationals

Packet by Florida

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Tossups

1. A novel from this country subtitled *The Hidden Notebooks* details Faye's attempt to communicate with his grandson before his death. In a novel from this country, a boy breaks his arm when a motorcycle runs him over while playing soccer in the street. *Doomi Golo* was written by a novelist from this country, the setting of another novel where a mother kills her child with sleeping pills. That novel from this country depicts the marriage of Mireille, a diplomat's daughter, to a Muslim man who experiments with polygamy. Another novel by an author from this country is framed as a letter that Ramatoulaye Fall writes to her friend Aissatou while grieving her husband's death. This country is home to the author of the novels *Scarlet Song* and *So Long A Letter*, Mariama Ba. Boubacar Boris Diop has written novels in Wolof in, for 10 points, what home country of Negritude co-founder Leopold Senghor?

ANSWER: **Senegal**

2. This woman participated in a shipwreck rescue mission and introduced metal lifeboats while working on Sable Island in Nova Scotia. In England, she collected writings of the York-based Quaker William Tuke. Her motto "every evil has its good and every ill an antidote" appears in her many letters to Millard Fillmore, chronicled in *The Lady and the President*. She wrote the children's book *Conversations on Common Things* after working as governess for Unitarian preacher William Ellery Channing. The Kirkbride Plan, named for Thomas Story Kirkbride, became standard after she testified to the New Jersey legislature in 1844 about horrors she witnessed while teaching Sunday school in jail. She later beat out Elizabeth Blackwell to be appointed Superintendent of Army Nurses during the Civil War. For 10 points, name this social reformer who championed humane treatment of the mentally ill.

ANSWER: Dorothea Lynde **Dix**

3. In the "delayed-then-rapid" scenario, this quantity stays constant for 3 billion years, then exponentially decreases. The halo mass which maximizes this quantity shifts lower with time, a phenomenon called "downsizing." For smaller galaxies, this quantity is decreased by "strangulation", while for larger galaxies, the decrease is caused by ISM heating from outflowing galactic winds or AGN feedback. It doesn't describe morphology, but the decrease in this quantity caused by galaxy quenching is believed to evolve galaxies from the blue cloud to the red sequence. The surface density of this quantity is proportional to the 1.4th power of the surface density of gas by the Kennicutt-Schmidt law. The product of the Hubble time and this quantity exceeds the mass of available neutral hydrogen in starburst galaxies. For 10 points, identify this quantity, of which the Milky Way has a value of about 3 solar masses per year.

ANSWER: **star formation rate** [or **SFR**; accept answers referring to the **rate** of **star formation**]

4. In an arrangement of one of these pieces, the orchestrator augments the music with a soft cymbal hit every sixth beat and arpeggios in the harp which alternate between cascading triplets on beats 2 and 3 and ascending triplets on beat 2. Years after its original publication, a private printing of one of these pieces listed as its dedicatee the composer's classmate Jeanne de Bret. One of these pieces opens with the left hand alternating between G major seventh and D major seventh chords and is marked *Lent et douloureux*. The first of these pieces was published in the magazine *La Musique des familles* alongside an excerpt from the poem "Les Antiques" by Patrice Contamine de Latour. The composer of these pieces claimed their title comes from Flaubert's *Salammbô*, but it may also refer to a festival with young, naked Greek men dancing. For 10 points, name this series of three languid compositions by Erik Satie.

ANSWER: *Trois Gymnopédies*

5. It's not a form of yoga, but a teacher from this philosophical school briefly converted to both Islam and Christianity, returning to his original faith after fusing with astral projections of Jesus and Muhammad. While dressed in women's clothing, that teacher from this school meditated so intensely that he menstruated through his pores. Max Mueller and Romain Rolland wrote biographies of a religious leader in this tradition, who introduced its doctrine that "jiva is shiva." The founding of this school is often traced to the *Brahma Sutra* commentaries of the 8th-century thinker, Adi Shankara. This philosophy's "non-dualistic," or "Advaita" form was spread worldwide by a leader who rose to fame with his speech at the 1893 Parliament of World's Religions. For 10 points, name this Universalist school of Hindu philosophy revived by Sri Ramakrishna and his student, Swami Vivekananda.

ANSWER: Advaita Vedanta [do not accept "Hinduism"]

6. *Two answers required.* Kemlu, a ministry based in one of these two countries, has condemned the actions of the other as having no basis in international law. The current conflict between these two countries over Natuna recalls a similar conflict that occurred in 2016. The Prosperous Justice Party is critical of the softness that Gerindra Party leader Prabowo has displayed during a conflict between these two countries. The president of one of these countries has stated that its territorial rights are non-negotiable after boats belonging to the other were found near the Riau Islands province in violation of the UNCLOS. One of these countries, which is the most powerful member of ASEAN, has an exclusive economic zone that intersects with the other's nine-dash line claim. In early January 2019, these two countries got into a territorial dispute over the South China Sea. For 10 points, Joko Widodo and Xi Jinping lead what two countries?

ANSWER: Republic of Indonesia AND the People's Republic of China [accept Republik Indonesia AND China; accept Indonesia AND PRC; accept Indonesia AND Zhōnghuá Rénmín Gònghéguó]

7. A character in this film is accused of being cruel after he tells a toothless old farmer "Don't lose your sense of humour." That character accidentally gets a man fired by pointing out that he is not wearing protective gloves. Another character in this film wears her assistant's blouse to a presentation on Dacoil after getting blood from her wounded toe on her shirt, and requests that her lover ejaculate onto a tray of petits fours so she can eat one. Another character in this film wears a fur-covered "kukeri" costume to a birthday party at which every other attendee is naked. In the final shot of this film set largely in Bucharest, a management consultant played by Sandra Huller tries on fake teeth belonging to the title figure, who also wears a shaggy brown wig. For 10 points, name this 2016 film in which Winfried tries to rejoin his daughter's life by masquerading as a different person, directed by Maren Ade.

ANSWER: Toni Erdmann

8. Sharon Street's "Darwinian Dilemma for Realist Theories of [this concept]" forces a choice between "normative skepticism" and claiming an "incredible coincidence." An evil demon who threatens to punish someone for not liking a saucer of mud is often discussed as a counterexample to the "fitting-attitude," or "buck-passing," theory of this concept. Heather Douglas used the example of dioxin studies in her "argument from inductive risk" against the "ideal" that science should be "free" of this concept, which Helen Longino has also critiqued. The trendy subfield devoted to the "theory" of this concept is also called axiology, and distinguishes the "instrumental" and "intrinsic" forms of this concept. The is-ought problem is related to the distinction between "fact" and this concept. For 10 points, what often-moral type of worth is assessed with namesake "judgements"?

ANSWER: **values** [accept **value** theory, the **value**-free ideal, or **value** judgements; accept word forms like **evaluative** facts; prompt on morality or ethics]

9. Applying this theoretical technique in the case of a time-dependent source distribution leads to toroidal contributions, which are important in nanophotonics and metamaterials. Each term in this theoretical technique is expressed as a traceless tensor because then each term is an irreducible representation of SO(3). This technique relies on the binomial theorem to rewrite the free-field Green's function. The quadratic term of this technique contains the quantity "three-halves cosine-squared theta minus one-half," which is exactly the second Legendre polynomial. The nth term in the series produced by this technique, which is only valid in the far-field regime, falls off as one over r-to-the-n. This technique expresses the potential of a charge or current distribution as an infinite sum over the spherical harmonics with this technique. For 10 points, name this theoretical technique that rewrites the electrostatic potential as an infinite series of contributions from different electric moments.

ANSWER: **multipole expansion**

10. Elizabeth Jane Weston wrote a set of neo-Latin odes dedicated to this ruler after moving from England to his capital with her stepfather Edward Kelley, who was imprisoned by this ruler for allegedly killing his court official. This ruler's court physician Anselmus Boetius de Boodt created an encyclopedia of minerals whileworking at a castle where this ruler allowed a lion and tiger to roam the halls. Michael Sendivogius was retained by this ruler, and lived with his guards on a street called "Alchemists' Alley," visited by John Dee to aid this ruler's quest to find the philosopher's stone. This ruler granted religious toleration in his domain by signing a document known as the "Letter of Majesty." He patronized Giuseppe Arcimboldo and Giambologna, who created works in a style known as [this ruler's] mannerism. His court also included Johannes Kepler and Tycho Brahe, who co-created a star catalogue known as the Tables of this ruler. For 10 points, name this Prague-based Holy Roman Emperor who ruled from 1576 to 1612.

ANSWER: **Rudolf** [or **Rudolf I**; or **Rudolf II** Holy Roman Emperor]

11. A poem titled for men who perform this action ends with the female narrator lamenting "Lad, thou hast gotten a child in me, / Laddie, a man thou'lt ha'e to be, / Yea, though I'm sorry for thee." After the murder of Jo Cox, British mourners widely retweeted another poem titled for this activity that concludes, "We should be kind / while there is still time." Those poems are by D.H. Lawrence and Philip Larkin. People engaged in this activity perpetrate a "Massacre" of quails in a passage spanning several stanzas from "Upon Appleton House." The speaker addresses "country comets, that portend / No war nor prince's funeral" in a poem spoken "to the Glow-Worms" by a man performing this action. Andrew Marvell wrote a series of four poems from the perspective of Damon, who performs, for 10 points, what activity that involves using a scythe to shorten grass?

ANSWER: **mowing** [or accept lawn **mowing**; accept The "**Mower**"; accept "A Youth **Mowing**"; accept "The **Mowers**"; accept "The **Mower to the Glow-Worms**" before it is read; accept **cutting grass** until "grass" is read]

12. These places are depicted in most of a series of paintings on double-square canvases that also includes *Tree Roots*. The first chapter of John Berger's *Ways Of Seeing* reproduces a painting of one of these places, then captions it with a biographical note on the next page, to illustrate how words change the meaning of images. A Martin Scorsese-played painter recedes into a recreation of a painting of one of these places at the end of the fifth vignette in Akira Kurosawa's *Dreams*. A 2011 Steven Naifeh and Gregory Smith biography claimed that, rather than killing himself in one of these places, a man was accidentally shot by two drunk teenagers. One of these places is depicted "under Thunder Clouds" in one of the paintings an artist completed at Auvers-sur-Oise shortly before his 1890 death. For 10 points, one of the last paintings by Vincent Van Gogh depicts what sort of place "with crows"?

ANSWER: **wheatfields** [accept **Wheatfield with Crows**; accept **Wheatfield under Thunder Clouds**; prompt on **fields** or **plains**; prompt on **grain fields**]

13. This god, called "high of plumes," takes an animal form identical to Heryshef, and is depicted on *mammisi*. His best-preserved temple at Esna shows the Roman Emperor Trajan dancing with one of his consorts, the warrior goddess Menhit. An inscription on the Famine Stela at Sehel Island describes how this god came to Imhotep in a dream to help him end a seven-year drought. This god created an egg from which the sun hatched. The full name of the pharaoh Khufu incorporates the name of this god, whose son Anuket and wife Satis make up his "triad." His other wife, or his female form in some versions, is the frog goddess Heqet. This assistant to the god Hapi was the dedicatee of a cult site at Elephantine, and he used the silt left behind by flooding of the Nile to perform his best-known activity. For 10 points, name this ram-headed Egyptian god who created the gods and humans using his potter's wheel.

ANSWER: **Khnum** [or **Khnum-Re**; or **Chnum**; or **Knum**; or **Khnemu**]

14. Computational methods that are not size consistent cannot accurately model large systems or this process. CCSD(T) fails for this process because of the collapse of the spin-restricted wavefunction and spin symmetry breaking. The anharmonicity is assumed to be constant in a method that calculates the energy required for this process by finding the area under the curve of a linear plot of energy versus vibrational energy level. The Birge-Sponer method calculates the energy of this process. A classic example of the limits of restricted Hartree-Fock is its inability to model this process in H₂. As *r* approaches infinity, the energy of the Morse potential approaches the energy required for this process, which is denoted D₀. Radicals are formed when a molecule undergoes the homolytic form of this process. For 10 points, name this process by which a molecule splits into multiple components.

ANSWER: bond **dissociation** [accept bond **breaking**; accept homolytic **cleavage**; accept bond **cleavage**; accept **homolysis**, or **photolysis**, or **thermolysis**]

15. In a poem, one of these people is told by his mother "Man's spunk is the salt of the earth" and becomes enraged when he sees his remarried father bouncing an infant on his lap. That poem told from the perspective of one of these people ends "Hell came when I saw MYSELF." In a novel, one of these people spends hours watching the Jerry Springer-esque "Patty Winters Show." Frank Bidart wrote several poems about one of these people named "Herbert White." A novel titled for one of these people begins with the phrase "Abandon all hope, ye who enter here" graffitied on a wall next to a bus advertisement for *Les Miserables*. Evelyn Richards is the fiancée of one of these people in a novel that features long passages describing mismatched fashion brands and diatribes on pop musicians. For 10 points, name this type of character exemplified by Patrick Bateman in Bret Easton Ellis' *American Psycho*.

ANSWER: serial **killers** [accept **murderers**; accept **psycho** or **psychopath**, prompt on "investment banker" with "who does what?"]

16. The best-known group to attempt this act were members of a club called the Old Headquarters, or Old Staff, including two Hungarians Gyula Sari and Lajos Marton. An earlier attempt to perform this act was stopped at the “Battle of the Transistors,” when radio messages were intercepted to discredit men based at Bab-el-Oued. This act was attempted by the engineer who developed the Nord SS.10 anti-tank missile, but he was foiled when a black car nicknamed the Goddess got away despite having two blown-out tires. That plan was codenamed Operation Charlotte Corday and tried to avenge the failure of the Generals’ Putsch. Raoul Salan had attempted this act, depicted in the opening scene of *The Day of the Jackal*, in order to retaliate for the Evian Accords where its target repudiated the OAS and acceded to the FLN in Algeria. For 10 points, name this act, which tried to liquidate the president of the Fifth Republic of France.

ANSWER: (attempted) **assassinations** of Charles **de Gaulle** [accept any reasonable equivalents that indicate people are trying to kill Charles **de Gaulle**; accept attempts to **overthrow** Charles **de Gaulle** as president of France; accept attempts to **replace** Charles **de Gaulle** as president of France]

17. In 2009, over the objection of publisher Hogrefe & Huber, these items were shown to the public in newspapers such as *The Guardian* after Canadian ER physician James Heilman published them on Wikipedia. Samuel Beck developed an early set of remarks on this set of items, which were the subject of a computerized system developed by Zygmunt Piotrowski and a “comprehensive system” co-developed by Irving Weiner. Criticisms over this set of items led to the development of 45 similar ones in 1961 by Wayne Holtzman. The fourth and seventh of these items were most commonly chosen to represent the “father” and “mother,” and the last three of them are the only ones consisting of several colors. The Exner system was developed to score a “projective” measure based on the interpretation of, for 10 points, what set of ten ambiguous, symmetrical images used in a psychological test?

ANSWER: Rorschach ink **blots** [or **Rorschach** test images; or **Rorschach** plates; or **Rorschach** cards]

18. This writer is asked, “Is this written in prose, or in verse?” in an anonymous Carolingian dialogue between him and his “detractor.” Renaissance stages which were divided into different “houses” are sometimes named for this playwright because they were depicted in the illustrations to 15th-century editions of his works. Hrosvitha of Gandersheim wrote her plays as Christian alternatives to this playwright’s works. This author defended himself against accusations that “eminent persons” helped him write in the prologue to a play in which a character’s abduction of a slave girl is blamed on the liberal parenting philosophy of his adoptive father. Chremes defends his snooping by proclaiming “I am human, I consider nothing human alien to me” in this author’s *The Self-Tormentor*. For 10 points, *The Brothers* is by what playwright who, like Plautus, wrote comedies in the Roman Republic?

ANSWER: **Terence** [or Publius **Terentius** Afer]

19. The newly-discovered desire to secure a monopoly in this natural resource led to the failure of the “Billinghurst-Latorre protocol.” Daniel Guggenheim nearly bankrupted his family by investing in this industry, years after the self-made British millionaire John Thomas North became known as the “King” of this resource. An attempt to tax this industry to finance infrastructure led to an eight-year civil war, ending in the suicide of President José Balmaceda. During World War I, the Central Powers lost access to this industry after Sir Frederick Doveton Sturdee broke the blockade of Maximilian von Spee. The region of Tarapacá contained fields of this resource, prompting it to be occupied along with Tacna and Arica. For 10 points, name this natural resource fought over in the War of the Pacific, eighty percent of which was produced in Chile, and which was also known as saltpeter.

ANSWER: **nitrate**s [or natural **nitrate**; or **guano**; or **nitrogen** fertilizer; or fixed **nitrogen**; accept sodium **nitrate**; accept Chile **saltpeter** before “saltpeter” is read; prompt on **fertilizer**]

20. A so-called “amoebic” disease of these structures is caused by *Neoparamoeba perurans*. The epithelium of these structures is mostly composed of pavement cells and mitochondrion-rich cells. Before Tidswell et al’s study of *Leucoraja erinacea*, it was believed that these structures derived from the ectoderm in gnathostomes and from the endoderm in cyclostomes. The firing of the L7 motor neuron via stimulation of the siphon or mantle causes withdrawal of these structures in a well-studied reflex arc in *Aplysia californica*. The spiracle is a reduced rostral one of these structures, which are only used for feeding in lancelets. In several species, a set of four bones called the opercular series covers these structures, which develop from pharyngeal pouches. For 10 points, name these organs that use countercurrent exchange to extract oxygen from water.

ANSWER: **gill** [or **branchial** slit]

Bonuses

1. This man was marooned on the Jean Fernández Islands off of Chile, one of which continues to bear his name, after leaving the employ of William Dampier on his ship, the *Cinque Ports*. For 10 points each:

[10] Name this Scottish privateer who became a celebrity after his mate Edward Cooke's account of his time as a castaway was published in England.

ANSWER: Alexander **Selkirk**

[10] This first governor of the Bahamas rescued Selkirk and capitalized off it by writing the book *A Cruising Voyage Round the World*. He also coined the motto "Pirates Expelled, Commerce Restored!" which adorned the flag of the Bahamas.

ANSWER: Woodes **Rogers**

[10] The golden age of piracy began to wane after the death of this famous pirate, also known as Edward Teach, led Rogers to hang a group of ten pirates who refused to repent their ways.

ANSWER: **Blackbeard**

2. In one play, a character of this profession is accosted for his fixation on "labels" and is told that homosexuals are men who can't pass a "pissant antidiscrimination bill" because they have zero clout. For 10 points each:

[10] Name this profession of the wheelchair-bound Emma Brookner, a polio survivor who speaks to the writer Ned Weeks in the opening scene of *The Normal Heart*.

ANSWER: **doctor** [or **physician**]

[10] Ned Weeks experiences flashbacks of his abusive childhood and undergoes experimental AIDS treatment in *The Destiny of Me*, a follow-up to *The Normal Heart* written by this long-time gay rights activist and playwright.

ANSWER: Larry **Kramer**

[10] Roy Cohn dismisses his AIDS diagnosis as liver cancer in the *Millennium Approaches* section of this "Gay Fantasia on National Themes" written by Tony Kushner.

ANSWER: **Angels in America**

3. This system is modeled with a differential equation that sets f -naught times cosine of ω -t equal to the following: x -double-dot, plus two beta times x -dot, plus ω -naught-squared times x . For 10 points each:

[10] Name this system. As a circuit, this system is represented as an LRC circuit connected in series.

ANSWER: **damped driven oscillator** [or **damped driven harmonic oscillator**; accept **driven damped oscillator** or the adjectives in any order; prompt on partial answer; prompt on simple harmonic **oscillator** with "Under what conditions?"]

[10] When the frequency of the driving force equals the natural frequency, oscillators exhibit this phenomenon where the amplitude of oscillation dramatically increases.

ANSWER: **resonance**

[10] Homogenous solutions to the damped driven oscillator are referred to by this term because they go to zero as time goes to infinity. This term refers to oscillations that die off before the system reaches steady-state motion.

ANSWER: **transients** [or **transient** motion]

4. Inspired by Munro Leaf's picture book about a bull who only liked to smell flowers, Eric Feldt gave the code-name "Ferdinand" to one organization of these individuals. For 10 points each:

[10] Name these Allied intelligence operatives who monitored Japanese naval activity in the Pacific during World War Two. Various tiny islands housed these individuals who provided information during the Guadalcanal Campaign.

ANSWER: **Coastwatchers** [accept **Coast Watch** Organization; accept **Combined Field Intelligence Service**; accept "**Section C**, Allied Intelligence Bureau"]

[10] Eric Feldt and his successor, James McManus, led those coastwatching efforts as part of this country's military. A dog named Gunner warned of incoming planes after the air raid on this country's city of Darwin.

ANSWER: Commonwealth of **Australia**

[10] Two coastwatchers, Biuku Gasa and Eroni Kumana, canoed for five days, located a coconut message, then rowed 40 more miles to save victims of this event. This event was caused by a collision with the *Amagiri*, and infamously saw one man swim four miles to Plum Pudding Island while pulling a fellow soldier with his teeth.

ANSWER: the sinking of **PT-109** [accept **PT-109** incident; accept destruction of **PT-109**; accept loss of **PT-109**; prompt on the sinking of the boat that John F. Kennedy was on; prompt on the sinking of the boat JFK was on]

5. The works of this painter were largely forgotten until the publication of a 1915 article by German art historian Herman Voss. For 10 points each:

[10] Name this 17th century genre painter who did most of his work in the small village of Luneville under the patronage of Louis XIII. He painted *The Fortune Teller* and candle-lit scenes like *Joseph the Carpenter*.

ANSWER: Georges de **La Tour**

[10] La Tour painted two versions of a scene in which three people on the left collude against a youth in this activity. A similar painting by Caravaggio shows two boys cheating a third at this activity.

ANSWER: playing **cards** [accept *The Card Cheat*; accept *The Cardsharps*]

[10] Historians have speculated that the Louvre's version of *The Card Cheat* is the original based on these features. This Italian term refers to small changes made during the creation of a painting, often revealed using x-ray analysis.

ANSWER: **pentimento** [or **pentimenti**]

6. Weight decay is an analogue of this linear method in neural networks. For 10 points each:

[10] Name this machine learning method for minimizing regression coefficients. Types of this method include lasso, which uses the L1 norm, and ridge, which uses the L2 norm.

ANSWER: **regularization** [accept **L1 regularization**; accept **L2 regularization**; accept **penalization**]

[10] Tikhonov regularization reduces down to this method when the Lagrange multiplier is zero. In this type of regression, the goal is to minimize the second power of the difference between the predicted and observed values.

ANSWER: ordinary **least squares** [or **OLS**]

[10] Chen, Donoho, and Saunders applied L1 regularization to this technique, calling the regularization "basis pursuit." In general, this technique seeks to exceed limits set by the Nyquist-Shannon theorem.

ANSWER: **compressed sensing** [or **compressive sensing**; or **compressive sampling**; or **sparse sampling**; prompt on signal processing]

7. The 2014 paper “Brothers in Arms” by Harvey Whitehouse et al. studies this process among Libyan rebels fighting to overthrow Muammar Gaddafi. For 10 points each:

[10] Give this two-word term for a process that can be measured by having people choose between pictures of overlapping circles representing the self and the group. William B. Swann identified four principles of this process.

ANSWER: **identity fusion** [do not accept or prompt on answers indicating “collective identification” or “group identification”]

[10] Whitehouse distinguishes between “doctrinal” and “imagistic” modes of these practices. Victor Turner’s *The Forest of Symbols* defines these practices, exemplified by the Christian sacraments, as a “stereotyped sequence of activities involving gestures, words, and objects.”

ANSWER: **rituals**

[10] A 2004 Whitehouse paper traces a divergence between group identification and identity fusion to a common root in this Arabic concept, often translated as “social cohesion,” which Ibn Khaldun popularized in the 1300s.

ANSWER: **asabiyyah** (ah-sah-BEE-yah)

8. Answer the following about extended techniques for everyone’s favorite idiophone, the vibraphone! For 10 points each:

[10] Vibraphonists often use this variant of the “traditional” cross-grip for four mallets. The outside mallets are more secure in this grip, making it easy to switch between playing chords and playing solos that would typically call for two mallets.

ANSWER: **Burton** grip [or **Burton** technique] (Named for jazz vibraphonist Gary Burton.)

[10] By pressing a hard mallet into a vibraphone bar, striking it with another mallet, and sliding the hard mallet along the bar, one can “bend” this property of the sound, which is how “high” or “low” we perceive the sound to be.

ANSWER: **pitch** [accept **pitch** bending]

[10] This non-mallet tool can be used to produce sustained, non-percussive tones from the vibraphone and other percussion instruments. The horse hair of these devices gets drawn across the edge of the vibraphone’s bars.

ANSWER: **bow** [or bass **bow**; accept violin, viola, or cello **bow**] (The technique is almost always a bass bow.)

9. This character decries “providence” and “fate,” noting “as a technologist, I am accustomed to reckoning with the formulas of probability.” For 10 points each:

[10] Name this UNESCO engineer who is told by Hannah Piper that his earlier lover, Sabeth, was actually his daughter.

ANSWER: **Walter Faber** [accept either underlined part]

[10] In this play by the author of *Homo Faber*, the protagonist is falsely told by his father, “the Teacher,” that he is Jewish. At the end of this play, the protagonist’s shoes are left onstage after he is killed by anti-Semitic invaders.

ANSWER: **Andorra**

[10] Max Frisch, the author of *Homo Faber*, drew on this playwright’s concept of “epic theater” for *Andorra*. This German Communist wrote politically-charged plays like *Mother Courage and Her Children*.

ANSWER: Bertolt **Brecht** [or Eugen Berthold Friedrich **Brecht**]

10. Answer the following related to food-based industrial disasters in American history, for 10 points each.

[10] A class action suit was brought against United States Industrial Alcohol after its holding tank containing this sweet substance exploded in Boston in 1919, resulting in a flood.

ANSWER: **molasses**

[10] The Imperial chicken processing plant in this tiny North Carolina town exploded in 1991, killing 25 workers who could not escape because the owner Emmett Rowe ordered all the back doors to be locked from the outside.

ANSWER: **Hamlet**

[10] In 1878, flour dust was ignited by stones during the Great Mill Disaster at the Washburn “A” Mill Complex in this U.S. state. Arguably the largest mass execution in US history occurred when a society called the “Knights of the Forest” tried to remove all Native Americans from this state during a war in 1862.

ANSWER: **Minnesota**

11. Coulter names a device for performing this task that records a dip in current whenever a microchannel is briefly occluded. For 10 points each:

[10] Name this task that can also be accomplished using a small slide containing a laser-etched nine by nine grid with smaller gridlines within, called a hemocytometer.

ANSWER: **counting** cells [accept more specific answers like **counting blood cells**, or **counting bacteria**, or **counting plankton**]

[10] This toluidine derivative is taken up by dead cells, and can be used alongside a hemocytometer to ensure only live cells are counted. It gets its name from the fact that it kills the parasite that causes African sleeping sickness.

ANSWER: **trypan blue**

[10] Dulbecco’s modified Eagle medium, or DMEM, is commonly used to culture eukaryotic cells. Said medium often contains phenol red, which serves as one of these substances that changes color with changes in pH.

ANSWER: **indicator**

12. For 10 points each, answer the following about literary works set in Quebec.

[10] The protagonist admires the rags-to-riches story of the “Boy Wonder” Jerry Dingleman and aspires to open a summer lake resort in Quebec’s town of Ste. Agathe in this author’s novel *The Apprenticeship of Duddy Kravitz*.

ANSWER: Mordichai **Richler**

[10] Florentine Lacasse falls in love with the electrician Jean Lévesque in the slums of Montreal while waitressing to scrape by in the aftermath of the Great Depression in this debut novel by Gabrielle Roy.

ANSWER: *The Tin Flute* [or *Bonheur d’occasion*]

[10] The title Irish soldier of this author’s novel *Sergeant Lamb on the Ninth* lands at Quebec and engages the American expeditionary force at Lake Champlain, though he is better known for writing *I, Claudius*.

ANSWER: Robert **Graves**

13. Many jazz standards, including “Salt Peanuts,” employ a 32-bar chord progression derived from this piece called its namesake “changes.” For 10 points each:

[10] Name this piece introduced in the Broadway musical *Girl Crazy*, which originally came with lyrics from its composer’s brother, Ira. That composer’s final concert piece was a set of variations on this tune.

ANSWER: “**I Got Rhythm**”

[10] The music for “I Got Rhythm” was written by this American composer, who also wrote the song “Summertime” for his opera *Porgy and Bess*.

ANSWER: George **Gershwin** [or Jacob **Gershwine**]

[10] This jazz musician’s recording “Shag” was one of the earliest performances based on the “Rhythm changes.” This soprano saxophonist’s recording of “Summertime” became the first hit for Blue Note Records.

ANSWER: Sidney **Bechet**

14. The Mahaparinirvana Sutra and other scriptures say that Buddha came upon the fort that predated this city and said “Three perils will threaten it - fire, water and internal strife.” For 10 points each:

[10] Name this city probably founded by Ajatashatru, and then made the capital of the Magadha kingdom by his son Udaya. The traveler Megasthenes confirmed that it also served as capital for the Nanda Empire.

ANSWER: **Pataliputra** [or **Pāṭaliputra**; accept **Palibothra**; accept **Pa-lin-fu**; accept **Patna**]

[10] Xuanzang found nothing but ruins at Pataliputra, but a little over a century earlier around 400 CE, this Chinese pilgrim and monk wrote about a vibrant city where he trekked by foot in search of Buddhist texts, in his *A Record of Buddhist Kingdoms*.

ANSWER: **Fǎxiǎn** [accept **Fa-Hien**; accept **Fa-hsien**]

[10] Under this empire, Pataliputra grew to be one of the largest cities in the world. Chandragupta and Ashoka were rulers of this empire.

ANSWER: **Mauryan** empire

15. These concepts are represented as ten nodes, with twenty-two interconnections, on the Tree of Life diagram. For 10 points each:

[10] Name these ten “emanations” of God in the system of Kabbalah.

ANSWER: **sefirot** [or **sephiroth**]

[10] This rabbi taught that the *sefirot* could be arranged into different “configurations” called *partzufim*, or “personas.” Known as “the Lion” or “Ha’Ari,” this rabbi founded the Safed school of Kabbalah.

ANSWER: Rabbi Isaac **Luria**

[10] In the Tree of Life diagram, the topmost node usually represents *keter*, while the lowermost node represents this other *sefirot*. God’s feminine aspect, the *shekhinah*, is identified with this *sefirot*, whose name means “kingdom.”

ANSWER: **Malkuth** [or **Malchut**]

16. The location of these entities prevents them from forming pi bonds or contributing crystal field effects. For 10 points each:

[10] Name this set of orbitals which are somewhat isolated within a certain set of elements’ [Xe] core. Their lack of bonding prevents them from undergoing vibronic coupling to break the Laporte rule.

ANSWER: **4f** orbitals [prompt on **f** orbitals]

[10] The poor shielding due to the 4f orbitals causes the namesake radius contraction of this block of elements.

ANSWER: **lanthanides**

[10] Calculations of the 4f orbitals, along with other orbitals, may be simplified by substituting the spherical harmonics for this computationally simpler set of 48-fold symmetric functions.

ANSWER: **cubic harmonics** [or **tesseral harmonics**]

17. The King of Asturias, Alfonso the Catholic, destroyed the area of this river valley to create an uninhabitable desert, meant to serve as the boundary between his kingdom and al-Andalus to the south. For 10 points each:

[10] Name this river, whose valley to the south of the Cantabrian Mountains was then repopulated in the ninth century.

ANSWER: **Douro** River [or **Duero**; or **Durius**]

[10] During the reign of Alfonso, the tomb of Saint James the Great was discovered at this site, and pilgrims who traveled the Way here carried back the scallops that covered James’ martyred body.

ANSWER: Santiago de **Compostela** [prompt on **Santiago**]

[10] The Douro river valley’s main export quickly became this product, shipped out from Porto. The Methuen Treaty fixed taxes on this Portuguese export in return for fixing English textile imports.

ANSWER: **wine**

18. In this novel, the single mother Nenna strikes up a friendship with a male prostitute named Maurice, who lives aboard a ship that is also named *Maurice*. For 10 points each:

[10] Name this Booker-winning novel about the struggles of a community of houseboat dwellers on the Thames River.

ANSWER: ***Offshore***

[10] *Offshore* was written by this acclaimed author of historical novels like *The Beginning of Spring* and *The Gate of Angels*. Florence Green opens the title store in a haunted house in this author's *The Bookshop*.

ANSWER: Penelope **Fitzgerald**

[10] Fitzgerald's writing has been continually praised by this former teaching colleague of hers, who adapted techniques of historical fiction for her own novel, *Possession*.

ANSWER: A.S. **Byatt** [or Antonia Susan **Duffy**]

19. Beginning in the 1650s, the Articles of War, a list of crimes and corresponding punishments, was read weekly to members of the British Royal Navy. Name some penalties they may have encountered, for 10 points each:

[10] Many strong sailors were needed to "run" this slow method of execution, which was mandatory viewing for a ship's crew. A probably innocent man named Philip Spencer, the son of John Tyler's Secretary of War, underwent this punishment for mutiny aboard the USS *Somers* in 1842.

ANSWER: being **hanged** (or **hung**) from the **yard**-arm [prompt on suffocation, or asphyxiation; prompt on spar in place of yard; prompt on hanging by saying "from which part of the ship?"; do not accept or prompt on "mast," or "bowsprit" in place of yard]

[10] "Kissing the captain's daughter" refers to this method of punishment, vigorously opposed by Richard Henry Dana Jr. and Herman Melville. This punishment typically featured usage of the cat o' nine tails.

ANSWER: being **whipped** [accept word forms; accept **flogging**; prompt on beating, spanking, thrashing, or words of similar implication]

[10] While more common among the Dutch, the Royal Navy sporadically issued this punishment of being stripped naked, tied to a rope that ran under the boat, and being painfully dragged over years of accumulated barnacles.

ANSWER: **keel hauling** [accept **kielhalen**]

20. In *Lame Deer, Seeker of Visions*, the Lakota philosopher John Fire Lame Deer contrasts the prevalence of these symbols in Native life with another motif that makes "prisoners" of "white men." For 10 points each:

[10] What things title an Emerson essay that begins by noting that "the eye is the first" of these things?

ANSWER: **circles** [or **hoops**] (The Lame Deer chapter is titled "The Circle and the Square.")

[10] In *The Dance of Person and Place*, the Shawnee philosopher Thomas Norton-Smith analyzed "circularity" as a principle for "ordering" this thing. That book draws heavily on Nelson Goodman's concept of "versions" of this thing, which he outlined in a book titled for "ways" of "making" this thing.

ANSWER: the **world** [accept **world**-ordering principles; accept **world** versions; accept *Ways of **Worldmaking***]

[10] This indigenous group's philosophy featured cosmic cycles driven by a power called *teotl*. The Florentine Codex was partly written by several of their "wise men," or *tlamatinime*.

ANSWER: the **Aztecs** [or the **Nahua**; or the **Mexica**]