

ACF Nationals 2016

Packet by Michigan A (Siddhant Dogra, Auroi Gupta, Brian McPeak, Will Nediger)

Tossups

1. In the 19th century, a man known as Hayyim of Belgrade was hired to print works written in this language. The first known work printed in this language is a 1510 treatise called *The Rules of Ritual Slaughter and Inspection of Animals*. In the 18th century, Abraham Assa made a translation of the Bible into this language, though 200 years earlier, the Soncino printing family made a Polyglot translation of the Bible in this language in Constantinople. Probably the most celebrated work printed in this language is Jacob Culi's *Me-am Lo'ez*. In Morocco, an "Occidental" or "Western" form of this language is used, called Haqitiya. Largely spoken in Salonika, this language is considered endangered like Yiddish, another language of the diaspora. It picked up Portuguese and Turkic influences after a certain group was expelled with the passage of the Alhambra Decree. For 10 points, name this language spoken by Sephardic Jews.

ANSWER: Ladino [accept Judaeo-Spanish or Judezmo, Dzhudezmo, or Spaniolit.]

2. This man used the examples of "optical analysis of light spectra" and perceiving "opacity as translucence" to distinguish between "factual fact" and "actual fact" in a pedagogical book that contains prints demonstrating the Bezout Effect. Because the color red represented love and passion, this artist's wife Anni forbade him from selling any painting that used red in it. This artist used oil paints on Masonite in a series whose entries include *Skyward*, *Somber Promise*, and *Earthbound*. While chair of the Department of Design at the Yale School of Fine Arts, this artist wrote *Interaction of Color*. Around the time he left teaching at Black Mountain College, this artist began his 25 year long project of creating a "pure" experience of color by placing three or four geometric shapes at the center of his canvases. For 10 points, name this abstract artist of the series *Homage to the Square*.

ANSWER: Josef Albers

3. While in an attic, this character looks at himself in a mirror composed of pieces of green glass and accidentally shatters a bottle, spilling the "ancient essence" of a "perfume" on a parquet. After dropping a red crayon while drawing soldiers, this character is terrified when he searches for and believes he encounters a "disembodied hand." Anxiety overpowers this man when he imagines a childhood fever called "the Big Thing" while sitting in a waiting room at the Salpetriere Hospital preparing for electroshock therapy. "A legend of a man who doesn't want to be loved" is this character's interpretation of the story of the Prodigal Son. Often obsessing over the nobility of the death of his grandfather Christoph Detlev, this Danish poet living in Paris meditates frequently about death in a novel named for his "Notebooks." For 10 points, name this character created by Rainer Maria Rilke.

ANSWER: Malte Laurids Brigge [accept either underlined name]

4. One result which provides a natural example of this theorem is that certain sequences of numbers in base hereditary notation always eventually go to zero. That example of this theorem was found by Paris and Harrington and was first proven by Goodstein. John Rosser strengthened this result by formulating a proof without assuming either omega-consistency or 1-consistency. Proofs of this theorem may rely on schemes such as one which maps symbols to integers and uses those integers as exponents for prime numbers. It's not Tarski's theorem, but the diagonalization lemma is used to show that one of this theorem's namesake sentences must exist. This theorem is often grouped with the result that sufficiently strong systems cannot prove their own consistency. For 10 points, name this result which states that certain theories will always contain results which are true but not provable in the theory.

ANSWER: **Godel's Incompleteness** Theorems [accept **Godel's first Incompleteness** Theorem; prompt on incompleteness theorem or Godel's theorem]

5. Two answers required. A battle between these two powers continued both day and night for a week, giving it the appropriate name Battle of the Torches as both sides fought by torchlight. The Frenchman Gabriel de Luetz helped advise one of these powers during its siege of the other's city of Van. These two powers signed the Treaty of Zuhab with each other, which was a consolidation of the earlier Peace of Amasya signed between them. One of these powers had its army modernized with the help of Robert and Anthony Shirley, for the purpose of opposing the other power. That army of one of these powers was composed of the Qizilbash, but was defeated by the other side at the Battle of Chaldiran by forces led by Selim the Grim, a loss that shattered Ismail I. For 10 points, name these two empires whose greatest leaders were Suleiman the Magnificent and Shah Abbas I.

ANSWER: **Ottoman** Empire and **Safavid** Empire

6. The Shake-and-Bake and HASSP methods are used to determine electron density and this quantity. This quantity can be found by creating a function where this quantity is zero and applying an inverse Fourier transform, giving a centrosymmetric map with special peaks called Harker sections. Peaks on that map represent vectors showing distances between atoms and the map itself is named for Patterson. Multiple isomorphous replacement and molecular replacement are ways of finding this quantity. When taking a diffraction pattern, the intensity of a structure factor can be found, but this quantity is lost. This quantity's recovery is the subject of a namesake problem in X-ray crystallography. This quantity is the same for two X-rays whose scattering paths have the same length, according to Bragg's Law. For 10 points, name this property which characterizes a wave along with amplitude.

ANSWER: **phase** [prompt on "crystal structure factor" until "structure factor" is mentioned]

7. A thought experiment by D. C. Stove attempts to resolve Hume's skeptical thesis by imagining 3,020 of these things being found and that they have their defining properties around 95 percent of the time. A paper that discusses the assertion that all sodium salts burn yellow includes a long footnote crediting Janina Hosiasson-Lindenbaum with using "degrees" to resolve a dilemma involving these objects; the main text of the paper uses Nicod's criterion of equivalence to examine what constitutes them. I. J. Good proposed a Bayesian solution to a problem involving these things that assigns a non-zero, but a very small value to observations. A paper called "Studies in the Logic of Confirmation" discusses a truth statement about these things, as well as its contrapositive; that paper by Carl Hempel is about the value of evidence inferred from not observing these things. For 10 points, name these animals whose "blackness" is the subject of an inductive paradox.

ANSWER: **ravens** [prompt on birds]

8. The idea that the culture of the 1960s influenced the prevalence of this issue has been labeled the "Woodstock defense." This issue caused the 2010 resignation of the Belgian Roger Vangheluwe. William Levada was criticized for his response to this issue in Portland, but in 2011, he published a set of guidelines for dealing with this issue. Organizations which were formed to deal with this issue include SNAP and Voice of the Faithful. This issue was the subject of the John Jay Report. J. Keith Symons was the initial culprit in a series of episodes in Palm Beach regarding this issue. Sean P. O'Malley heads a commission investigating this issue. After journalists from the *Boston Globe* investigated this issue, Bernard Law offered his resignation. For 10 points, name this issue dramatized in the movie *Spotlight* and investigated by the Pontifical Commission for the Protection of Minors.

ANSWER: **sexual** abuse of minors in the Roman **Catholic** Church [prompt on partial answers, player must identify both "**sexual** abuse" and "**Catholic** Church" - in place of sexual abuse, accept equivalent references like: "**sex** scandal / crimes" or "child molestation" or "pedophilia"]

9. This dynasty's name was used informally to refer to the gold, silver, and copper basins that they exported. A king from this dynasty commissioned an enormous bronze bell that legendarily did not ring until a child was cast into the metal. Munmu was the first king of this dynasty's "later" period. This dynasty annexed the Gaya confederacy in a punitive expedition. This dynasty employed a cultured class of cosmetic-using soldiers called the "flowering knights," or "hwarang." This dynasty evaluated everything from the permitted color of garments to marriage rights through a person's proximity to the royal throne via the bone-rank system. This kingdom conquered its rivals Baekje and Goguryeo, but was itself overpowered by the Goryeo kingdom. For 10 points, name this Korean kingdom from 57 BCE to 935 AD, whose name may be cognate with the current South Korean capital.

ANSWER: **Silla**

10. In a novel by this author, a tennis match gets so heated that one of the players starts savagely beating the other's face with a racket. A character created by this author concludes that a mysterious man with a vast retinue of followers must be Peter the Great on his embassy to Europe. At a sheep-fair, two characters interrogate this author about a letter he published in *Blackwood's Magazine* describing two shepherds exhuming the corpse of a suicide victim. The prostitute Arabella Calvert witnesses a duel in a novel by this author that leads to son of the Laird of Dalcastle getting stabbed in the back. The second section of that novel by this man is narrated by the title character, who is convinced by his father that he is part of the Calvinist "elect" and is forced into committing a series of bizarre murders by the devil-doppelganger Gil-Martin. For 10 points, name this Scottish author of a psychological novel about the crimes of Robert Wringham called *The Private Memoirs and Confessions of a Justified Sinner*.

ANSWER: James **Hogg**

11. A renovation project led by this architect added a fir-paneled irregular-spiral accessibility ramp in the Walker Court and a new wing with a blue exterior featuring two snakelike cantilevered staircases. A still-unbuilt design by this architect includes an almost 500-foot-long stainless steel "tapestry" depicting images of the Midwest as well as two 80-foot-tall posts suggesting the ruins of a temple. A residential tower designed by this man is located at 8 Spruce Street in Manhattan. He led the 2008 redesign of the Art Gallery of Ontario and designed the planned Dwight D. Eisenhower memorial. Coosje van Bruggen and Claes Oldenburg designed the distinctive parking garage entrance of this man's "Binoculars Building." Another of his projects has a central atrium nicknamed "the flower" and is located on the Nervión River; that museum is clad in his characteristic undulating titanium sheets. For 10 points, name this architect of the Guggenheim Bilbao.

ANSWER: Frank **Gehry** [or Frank Owen **Gehry**; or Frank Owen **Goldberg**]

12. A composer from this country made each of the three repetitions of the tenor faster by a factor of two-thirds in a pan-isorhythmic, three-part diminution motet that name-drops fourteen composers from this country's court. That composer's *Quam pulchra es* exemplifies a style of polyphony featuring major-mode tonality and triadic harmony that was known as this country's "contenance," or "manner." A composer from this country had the two top voices sing the same line half a bar apart while four of the bottom five voices sing the same melody at different speeds, two in inversion, in his *Miserere nostri*. Of the two composers who were granted a twenty-one year monopoly on polyphonic music in this country, the elder wrote the so-called "third mode melody" and the 40-part motet *Spem in alium*. For 10 points, name this home country of John Dunstable and Thomas Tallis.

ANSWER: **England** [accept the **UK** or the **United Kingdom** of Great Britain and (Northern) Ireland]

13. Samuel Flagg Bemis wrote a two-volume biography of this politician, who gave a speech saying that America has a spear and a shield, “but the motto upon her shield is Freedom, Independence, Peace.” That speech also noted that America “is the well-wisher to the freedom and independence of all” and “goes not abroad, in search of monsters to destroy,” and was delivered on Independence Day. This man, whose diplomatic stint in Berlin led him to write *Letters on Silesia*, was elected after a deciding vote was unexpectedly cast by Stephen Van Rensselaer. Known by the nickname “Old Man Eloquent,” he spoke as a defense lawyer for the Amistad slaves. He was appointed as the first United States minister to Russia, and as Secretary of State, he set the 49th parallel as the northern border. For 10 points, name this man who won an election where a “corrupt bargain” was allegedly struck with Henry Clay, causing him to defeat Andrew Jackson in 1825.

ANSWER: John Quincy Adams [do not accept or prompt on “John Adams”]

14. A book named for this person describes how the author befriended him in Uganda; but that book subtitled “A Friendship Across Five Continents” gradually turns into an excoriation, describing him as “much weaker and needier than me.” Edward Said stated that this author is a “celebrated sensibility on tour,” and that his obsession with Islam “caused him to somehow stop thinking” in a review of this man’s *Beyond Belief* and *Among the Believers*. Paul Theroux wrote a book named for this author’s “Shadow.” This man’s nonfiction includes a trilogy about India with books subtitled “A Wounded Civilization” and “A Million Mutinies Now.” His love for the exotic inspired a novel in which Ferdinand convinces the protagonist to flee from Africa before the arrival of the Big Man. For 10 points, name this author who wrote about Salim in *A Bend in the River*.

ANSWER Vidia(dhar) Seepersad “V. S.” Naipaul

15. This reaction produces putrescine in the committed step of polyamine synthesis. A single function enzyme that catalyzes this reaction on orotidine monophosphate in yeast and bacteria is paired with a phospho-ribosyl- transferase in UMP synthase in mammals. The enzyme with the highest catalytic proficiency of any enzyme known carries out this reaction on uro-porphyrinogen. An enzyme carrying out this reaction has isoforms with molecular weights 65 and 67 kD, and is frequently targeted by autoantibodies used as a biomarker for type 1 diabetes. In fermentation, acetaldehyde is produced from pyruvate via this type of reaction, which also converts histidine to histamine. The physiologically most famous reaction of this kind converts an excitatory neurotransmitter into an inhibitory one. For 10 points, name this reaction that converts glutamate to GABA via the removal of CO₂.

ANSWER: decarboxylation [or word forms; or removal of CO₂ before mentioned; do not accept or prompt on “carboxylation”]

16. In the index to one of his books, this thinker modestly referred to himself as “another pupil of George Sarton,” who mentored him as a grad student. In a posthumous work, this man cited a nudist camp in Atlanta and a ranch in Australia as among the many places that use the word “serendipity.” He listed disinterestedness and organized skepticism among his set of norms for science, referred to by the acronym CUDOS. He defined five modes of adaptation in terms of whether one accepts or rejects cultural goals and institutionalized means as part of his theory of deviance.” This thinker advanced the Weberian thesis that early experimental science was linked to the rise of Protestant Pietism. This sociologist distinguished between manifest and latent functions and promoted the construction of middle-range theories. For 10 points, name this sociologist who wrote *Social Theory and Social Structure* and coined the terms “role model” and “self-fulfilling prophecy.”

ANSWER: Robert King **Merton**

17. A poem by this author informs George Herbert that “your descendant is a Black / Lady in South Carolina, her name is Irma,” and describes a man who helped girls jump out of windows during the Triangle Shirtwaist Fire. The player uses a “neuro-electronic matrix” to enter the memories of four deceased individuals in this man’s collaborative work with Synapse Software, the interaction fiction game *Mindwheel*. A long poem by this author dubs members of the title profession “the first citizens of contingency,” and presents *The Bacchae* as a case study in madness. This author collected his poems “Shirt” and “Essay on Psychiatrists” in the collections *The Want Bone* and *The Figured Wheel*, respectively. The lines “Midway on our life’s journey, I found myself / In dark woods, the right road lost” open a terza rima- preserving translation by this man. For 10 points, name this founder of the Favorite Poem Project, a former US Poet Laureate who translated Dante’s *Inferno*.

ANSWER: Robert **Pinsky**

18. It didn’t happen in Chile, but the group GreenJolly released a hip-hop anthem during this event whose title means “Together we are many, we cannot be defeated.” This event was precipitated by lingering resentment from four years earlier over the president being caught on tape ordering the kidnapping of a journalist in the Cassette Scandal. The civic youth organization *Pora!* was set up to coordinate nonviolent resistance during this event. The Order of Princess Olga was bestowed upon the tireless old lady Paraska Korolyuk for her role during this event. Two months before this event, one of its key players suffered facial disfigurement in a mysterious bout of dioxin poisoning. This event was co-led by the crown-braided businesswoman Yulia Tymoshenko. Viktor Yuschenko was declared the winner of a revote forced by this event. For 10 points, name this series of mass protests following the result of the 2004 election in Ukraine.

ANSWER: **Orange Revolution**

19. This quantity corresponds to a one-form in an effect which is due to the monodromy of the path taken by a particle. The Proca Lagrangian has a term with a mass times the square of this quantity. A field tensor usually denoted "F mu nu" is equal to "d mu times *this quantity* sub nu" minus "d nu times *this quantity* sub mu". That covariant form of this quantity must be added to the QED Lagrangian to preserve gauge invariance. This quantity at x equals mu over four pi times the integral over all space of the current density over x minus x prime d x prime. This quantity's gauge transformation involves adding the gradient of a function. Its divergence is zero in the Coulomb gauge. The electric field has a term equal to minus this quantity's time derivative and a term equal to minus the gradient of a similar scalar quantity. For 10 points, name this quantity whose curl gives the magnetic field, which is symbolized A.

ANSWER: magnetic **vector potential** [or **four-potential**]

20. A bastard son of King Priam is killed while performing this activity when his head is crushed by a stone thrown by a man who then ironically notes that there are "divers among the Trojans." Sithon resolved to sacrifice his daughter Pallene next to Dryas, who had been killed because a man who performed this activity for Dryas had been bribed. In the *Iliad*, people whose primary role was performing this activity include Calesius, Cebriones, and Meriones. While performing this activity, Automedon consoles Balios and Xanthus after Patroclus's death. To commemorate Erichthonius's innovations in this activity, Zeus made him into the constellation Auriga. Myrtilus replaced bronze lynchpins with fake wax ones to kill Oenomaus as he performed this activity. For 10 points, name this activity, in which one commands a horse-drawn cart in battle.

ANSWER: driving a **chariot** [or being a **charioteer**; or **chariot** racing; prompt on word forms of "driving" or "racing"]

Tiebreaker. This artist often claimed to have studied in the atelier of Jacques-Louis David, though Alice Ford's biography of this man casts doubt on the claim. He posed for John Vanderlyn so that Vanderlyn could finish his portrait of Andrew Jackson, because of their similar stature. The White House is home to a portrait of this man in frontier dress by John Syme, which was commissioned by the engraver W. H. Lizars, who collaborated with this artist, as did Robert Havell. His work is often contrasted with that of his contemporary Alexander Wilson. The original edition of his most famous work is sometimes called "the double elephant folio," and that work is much more popular than his *Viviparous Quadrupeds of North America*. For 10 points, name this French-American painter and naturalist, best known for his *Birds of America*.

ANSWER: John James **Audubon** [or Jean **Rabin**]

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Bonuses

1. This play's protagonist marries Sam Evans but secretly aborts the child she has with him, then conceives a child with Ned Darrell because insanity runs in Sam's family. For 10 points each:

[10] Name this play about Nina Leeds, in which characters often freeze in place while other characters to deliver short soliloquies and asides to the audience.

ANSWER: **Strange Interlude**

[10] *Strange Interlude* won a 1928 Pulitzer for this playwright, who premiered *Mourning Becomes Electra* three years later.

ANSWER: Eugene **O'Neill** [or Eugene Gladstone **O'Neill**]

[10] In O'Neill's comedy *Ah, Wilderness!*, this is the name of Richard Miller's vivacious sister. It's also the name of the rich woman who calls Yank a "filthy beast" in O'Neill's play *The Hairy Ape*.

ANSWER: **Mildred**

2. One *hadith* states that praying at these places is 25 times more effective than doing it elsewhere, and these locations often include open spaces called *sahn* which contain fountains.

For 10 points each:

[10] Name these places of worship, where one might practice *salat*.

ANSWER: **mosques** [or **masjid**]

[10] An imam will stand on of these raised pulpits that consists of six or seven steps to preach in a mosque. The first one was built by a carpenter in Medina, who noticed Muhammad was weary from addressing the entire crowd.

ANSWER: **minbar**

[10] Mosques often contain one of these areas reserved for a sultan. Initially a wall of mud bricks, this structure was supposedly first crated for Caliph Uthman so that he could pray safely without fear of assassination.

ANSWER: **maqsurah**

3. Stephen Báthory's Livonian campaign culminated in a failed siege of this city, which after 31 attacks prompted a writer to declare "this city reminds me of Paris." For 10 points each:

[10] Name this capital of a medieval principality which was joined with the Novgorod Republic for about a century, until becoming independent again by the 1348 Treaty of Bolotovo.

ANSWER: **Pskov** [or **Pleskov**]

[10] The first prince of Pskov was Sudislav, the son of this "great" Grand Prince of Kiev, who converted the Kievan Rus to Christianity.

ANSWER: **Vladimir** Sviatoslavich the Great

[10] The story about Vladimir rejecting Islam because of its prohibition on alcohol comes from the Primary Chronicle, which was likely compiled by this monk who lived at the Monastery of the Caves. He also wrote a work called the Reading, about the murders of Boris and Gleb.

ANSWER: **Nestor** the Chronicler

4. Characteristic multipliers in this theory are equal to the exponential of its namesake exponents times the period, and this theory can be used to find solutions to the Mathieu equation. For 10 points each:

[10] Name this theory used to analyze differential equations of the form $x' = A(x) \cos t$, where A is a periodic function.

ANSWER: **Floquet** theory

[10] Floquet theory can be useful for analyzing how oscillatory potentials can mix the quantum states of these types of atoms, which have one or more of their outer electrons in states with extremely high principal quantum numbers.

ANSWER: **Rydberg** atoms

[10] Because they respond so strongly to electromagnetic fields, Rydberg atoms serve as good probes for both the Stark effect and this effect, in which weak magnetic fields shift the energy levels of atoms.

ANSWER: **Zeeman** effect

5. Answer the following about Nicolas Rolin, for 10 points each.

[10] Rolin commissioned this huge nine-panel altarpiece, sometimes called *The Last Judgment*, for its namesake hospice. Its central panel shows Jesus sitting on a rainbow above the Archangel Michael, who is weighing souls.

ANSWER: **Beaune Altarpiece** [by Rogier van der Weyden]

[10] More famously, Chancellor Rolin commissioned this artist to paint him with the Madonna. He worked on the *Ghent Altarpiece* with his brother Hubert.

ANSWER: Jan **van Eyck**

[10] The *Madonna of Chancellor Rolin* was basically copied for a Rogier van der Weyden painting of the Virgin Mary being drawn by this saint. Early modern European painters' guilds were often named for this saint.

ANSWER: Saint **Luke** [or **Luke** the Evangelist]

6. It takes its name from Shakespeare's *Julius Caesar* and was inspired by its author's time covering a coup. Ironically, this novel itself inspired the coup partly funded by Mark Thatcher in Equatorial Guinea. For 10 points each:

[10] Name this novel in which James Manson hires "Cat" Shannon and his mercenaries to overthrow the fictional country of Zangaro so that Manson can acquire the precious platinum within.

ANSWER: *The **Dogs of War***

[10] *The Dogs of War* is a novel by this spy and journalist, who covered the Biafran War. His book *The Day of the Jackal* depicts an assassination attempt on Charles De Gaulle.

ANSWER: Frederick **Forsyth**

[10] Frederick Forsyth's *The Phantom of Manhattan* is a sequel to the Andrew Lloyd Webber musical *The Phantom of the Opera*. The musical itself was based on the novel written by this Frenchman.

ANSWER: Gaston **Leroux**

7. This man's theories have been defended from a feminist perspective by Juliet Mitchell. For 10 points each:

[10] Name this psychologist, the subject of an essay on his "sexual solipsism" by Betty Friedan, whose book *The Feminine Mystique* criticized his concept of "penis envy."

ANSWER: Sigmund **Freud**

[10] This Shulamith Firestone book, subtitled "The Case for Feminist Revolution," criticizes Freudianism. It calls for an abolishment of the distinction between the "aesthetic mode" and the "technological mode."

ANSWER: *The **Dialectic of Sex***

[10] Firestone acknowledged that her writing was influenced by the 1968 book *The Population Bomb*, written by this man and his wife, which warned of a Malthusian catastrophe. It was based on a pamphlet by Hugh Everett Moore, the founder of the Dixie Cup Company.

ANSWER: Paul **Ehrlich**

8. A storm caused a Roman fleet led by Lucius Valerius to drift into the gulf off of this city during the Festival of Dionysus, angering its leaders who thought Rome had violated a pact signed earlier. For 10 points each:

[10] Name this city. Rome declared war on it after the Roman ambassador Postumius was insulted by Philonides; it was then sacked by Lucius Aemilius Barbula.

ANSWER: **Taranto** [or **Tarentum**]

[10] The winning commander of this battle, who was assisting Taranto in its war with Rome, switched armor with one of his bodyguards, who died soon after. The deployment of war elephants followed by Thessalian cavalry won this battle, fought a year before the Battle of Asculum.

ANSWER: Battle of **Heraclea**

[10] This winning commander at both Heraclea and Asculum commented "one more such victory, and we are done," giving rise to his namesake type of victory.

ANSWER: **Pyrrhus** of Epirus [or Pyrrhos]

9. This entity is described with the phrase *coincidentia oppositorum*, since it is a "synthesis of opposites in a unique and absolutely infinite" way. For 10 points each:

[10] Name this entity which Nicholas of Cusa argues cannot be known through reason, but only through a supra-rational process called "Learned Ignorance," in his book *De Docta Ignorantia*.

ANSWER: **God** [accept equivalents indicating the same thing; such as **Lord**]

[10] In his book *The Individual and Cosmos in Renaissance Philosophy*, this author argued that Nicholas of Cusa was the "first modern philosopher" since he asked not about God, but about the possibility of knowing God. This neo-Kantian also engaged in the Davos debate with Heidegger about Kant's *Critique of Pure Reason*.

ANSWER: Ernst **Cassirer**

[10] This earlier philosopher used the phrase "learned ignorance" to describe all believers, since by yearning for God, one is asking to know about something that he or she cannot know. That argument appears in his book *The City of God*.

ANSWER: St. **Augustine** of Hippo

10. The White-Juday interferometer was used by NASA to detect a created pocket of spacetime that satisfied this metric. For 10 points each:

[10] Name this metric, named for a Mexican physicist, which theoretically would allow for the creation of a space-time bubble that would allow for supraluminal travel.

ANSWER: **Alcubierre** metric

[10] The Alcubierre metric is a solution to these equations central to general relativity, which relate the curvature of space and time to matter and energy.

ANSWER: Einstein **Field** Equations [prompt on Einstein's Equations]

[10] In his book *Black Holes and Time Warps*, this physicist argues that wormhole solutions to the Field Equations would violate the chronology protection conjecture. Another statement named for this scientist gives the conditions for when an object would form a black hole.

ANSWER: Kip **Thorne**

11. The first suite of this composition ends with a movement called "Carillon" in which the horns imitate tolling church bells. For 10 points each:

[10] Name this composition that uses a theme based on the Epiphany carol "March of the Kings" in both its first suite's "Prelude" and its second suite's concluding "Farandole." It was written to accompany an Alphonse Daudet play.

ANSWER: incidental music to *L'Arlesienne* [or the *L'Arlesienne Suites*]

[10] This French composer of the incidental music to *L'Arlesienne* and a precocious *Symphony in C* is best known for his opera *Carmen*.

ANSWER: Georges **Bizet** [or Alexandre César Léopold **Bizet**]

[10] This New Orleans-born French composer arranged the *L'Arlesienne Suite No. 2* and two suites of music from *Carmen*. He also wrote orchestral recitatives for both *Carmen* and Offenbach's *The Tales of Hoffmann*.

ANSWER: Ernest **Guiraud**

12. Answer the following about memorable quotes from *The Tempest*, for 10 points each.

[10] This character rises from her game of chess with Ferdinand after her father Prospero appears with the rest of the cast, then wonderingly declares "How beauteous mankind is! O brave new world, / That has such people in't!"

ANSWER: **Miranda**

[10] Antonio attempts to convince Sebastian of the inevitability of the murder they are planning in a passage that begins "We all were sea-swallow'd, though some cast again, and by that destiny to perform an act, whereof what's past is" this word.

ANSWER: "what's past is **prologue**"

[10] This character sings an amusing drinking song that includes the couplet "She loved not the savour of tar nor of pitch, / Yet a tailor might scratch her where'er she did itch" before encountering what he thinks is a four-legged monster on the beach. He is worshipped as a god by a character to whom he introduces the joys of wine.

ANSWER: **Stephano**

13. This man may have been ousted from office due to worries that he would be succeeded either by his cocaine addicted son, known as "Freddie," or his other son, a gay pilot named Gustavo. For 10 points each:

[10] Name this long-time dictator, a member of the Colorado Party, who came to power in Paraguay after a coup against Federico Chavez.

ANSWER: Alfredo **Stroessner**

[10] These documents, found in 1992 by Martin Almada, contain accounts of the atrocities committed under Stroessner's regime during Operation Condor.

ANSWER: **Archives of Terror** [or **Archivos del Terror**]

[10] In 1936, Paraguayan war hero José Estigarribia and president Eusebio Ayala were overthrown in a revolution named for this month. This month then provided the name for the new democratic socialist party in Paraguay, which was outlawed by Stroessner in 1951.

ANSWER: **February** [or the **Febreristas** or **Febrero**]

14. This man kills dozens of warriors hiding in flour bags by crushing their skulls before tossing his nephew Gwern into a fire. For 10 points each:

[10] Name this asshole from Welsh mythology, the half-brother of Bran and Branwen. After he isn't consulted regarding Branwen's marriage, he mutilates horses belonging to Matholwch.

ANSWER: **Efnisien** [or **Efnysien** fab Euroswydd]

[10] In recompense for the horses, Bran gives Matholwch one of these objects that can restore people to life, but in doing so makes them mute. Efnisien later sacrifices himself to destroy it by jumping into it.

ANSWER: **cauldron** [accept the **Cauldron** of Rebirth or the **Pair Dadeni**]

[10] After suffering a mortal wound, Bran asks the survivors to cut off this body part of his. This body part continues to talk, and is eventually buried facing France to prevent invasion.

ANSWER: his **head** [do not prompt on or accept anything else, like "skull"]

15. For 10 points each, answer the following about senescence in cells.

[10] The senescence-associated variety of this enzyme is a common marker used to test for senescence. Visualizing activity of this enzyme, or lack thereof, is the basis of the blue-white screen in molecular biology.

ANSWER: **beta-galactosidase** [or **beta-gal**; or **β-gal**]

[10] Replicative senescence comes from degradation of these DNA sequences found at the ends of chromosomes. Their continued degradation eventually causes a cell to reach the Hayflick limit.

ANSWER: **telomeres**

[10] The V600E mutation in this gene was shown to induce cell cycle arrest in human melanocytes, providing early evidence for oncogene induced senescence. It encodes a namesake protein kinase that activates MEK.

ANSWER: **BRAF**

16. This cycle's second epilogue consists of a series of couplets, including one stating "I shouldn't forget / The deafening roar of Black Maries' black band." For 10 points each:

[10] Identify this cycle of poems about life under the Stalinist Terror. In a section called "Crucifixion," the author depicts the "Magdalena writhed and sobbed in torments."

ANSWER: **Requiem**

[10] The arrest of this author's son Lev Gumilev inspired this author to write "I've cried for seventeen long months, / I've called you for your home" in her poetic cycle "Requiem." She also wrote "Poem Without a Hero."

ANSWER: Anna **Akhmatova** [or Anna Andreyevna **Gorenko**]

[10] *Requiem* begins with this section, which describes the speaker's 17 months waiting in a line outside a prison. A woman, whose lips had turned blue due to cold, "smiles fleetingly" when the speaker admits that she can describe the scene in this section.

ANSWER: "**Instead of a Preface**" [do not accept or prompt on partial answers.]

17. These compounds exhibit a special type of ionization isomerism in which a certain neutral ligand enters or leaves the coordination sphere. For 10 points each:

[10] Name these inorganic compounds which include Epsom salt. They are denoted with a single dot in their molecular formula.

ANSWER: **hydrates**

[10] Noble gas compound hydrates are an example of this class of compounds, in which one molecule forms a "cage" inside which the other molecule is trapped.

ANSWER: **clathrates** [prompt on "host-guest compounds"]

[10] Clathrates are a sub-type of this class of compounds, in which one molecule forms a lattice with vacancies or cavities occupied by another molecule.

ANSWER: **inclusion** compounds [prompt on "host-guest compounds"]

18. This group cancelled performances and television appearances whenever organizers were hostile to Eugene Wright, their black bassist. For 10 points each:

[10] Name this group behind *Jazz Impressions of Japan* and *Jazz Impressions of New York*. Their tour of college campuses produced hits like *Jazz at the College of the Pacific* and *Jazz at Oberlin*.

ANSWER: the **Dave Brubeck Quartet**

[10] The Quartet is best known for producing this album, which features tracks such as "Three to Get Ready", "Blue Rondo a la Turk", and "Take Five".

ANSWER: **Time Out**

[10] This longest song on *Time Out* is also the only one in 4/4 time, though it opens with a *rubato* piano solo with an unusual 10-bar phrase length.

ANSWER: "**Strange Meadow Lark**"

19. Answer some questions about the siege of Boston, for 10 points each:

[10] The siege ended soon after Washington ordered fortification of this location with cannons brought from Fort Ticonderoga. Like the Charlestown Heights, this location gave a good view of Boston and its harbor.

ANSWER: **Dorchester Heights**

[10] This obese man proposed and carried out the transfer of cannons from Ticonderoga, dubbed the artillery train. He later became the United States' first Secretary of War.

ANSWER: Henry **Knox**

[10] The run-up to the battles at Lexington and Concord featured a "dress rehearsal" in which Governor Thomas Gage caused an "Alarm" named for this substance, by executing a secret mission in September 1774 after getting a letter from William Brattle.

ANSWER: **powder** or **gunpowder** [i.e. the Powder Alarm]

20. An orange snowfall in Siberia in 2007 was incorrectly speculated to have been caused by a rocket launch from this city. For 10 points each:

[10] Name this city in Kazakhstan once known as Star City, which is rented and administered by Russia. It houses a launch facility called its namesake "cosmodrome."

ANSWER: **Baikonur** [or **Leninsk**, prompt on Zvezdograd or Star City]

[10] Baikonur is located in a desert ecoregion of this type, which is a mostly treeless grassland. Dino Buzzati wrote about the Tartar one of these ecoregions, which covers much of central Asia.

ANSWER: **steppes**

[10] The far southeast of Kazakhstan, on the Chinese border east of Almaty, features this canyon, which is home to the "Valley of Castles" rock formations. It's fed by a namesake river that rises from the Tian Shan Mountains and contains the Moinak Hydro Power Plant.

ANSWER: **Charyn** Canyon or River [or **Sharyn**]