

2021 ACF Nationals

Packet 4 by the Editors

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Tossups

1. A great chancellor who died in the final year of this century interpreted a dream about a large parrot with two broken wings as a prophecy that the emperor's two sons must govern. A powerful emperor who ruled in this century defeated Ashina Duobi to conquer the Eastern Turkic khaganate and welcomed the missionary Alopen to his court. The aforementioned chancellor was fictionalized by orientalist Robert van Gulik as Judge Dee, drawing on his actual name Di Renjie, while Alopen became the subject of the later-erected Nestorian Stele. The most powerful Chinese emperor of this century took power after the Xuanwu Gate Incident. That man, Li Shimin, was also known as the Taizong Emperor and saw his line interrupted at the end of this century by the short-lived Zhou Dynasty. For 10 points, name this century that saw the rise of the Tang Dynasty and ended with the ascension of Empress Wu.  
ANSWER: **7th** Century AD [or the **600s** AD; or the **600s** CE]

2. A colony of people who supported this movement was founded by Henry Stephens Clubb on the banks of the Neosho River in Kansas. The first book to directly argue for this movement in America was by William Metcalf. The American society for this movement, co-founded by William Alcott, first met in 1850 in New York City. It's not related to masturbation, but the celebrity Bernarr Macfadden adopted this cause after reading works of the Bible Christian Church. This cause, advocated in response to the 1832 cholera epidemic by a Presbyterian minister, was popularized by an invention called Protose, made at the Sanitarium in Battle Creek by John Harvey Kellogg. It was pioneered when Sylvester Graham invented his "unbolted wheat bread," or Graham cracker. For 10 points, name this movement supported by American religious leaders against the evils caused by consumption of animals.  
ANSWER: **vegetarianism** movement [or **veganism**; or more specific answers like muscular **vegetarianism**; accept descriptive answers like **non-consumption of animals** or **not eating meat** before "animals" is read]

3. Genes responsive to this compound in *S. cerevisiae* ("sera-VIS-ee-ay") require Med15 as a transactivator for a transcription factor that binds to a CGG-N11-CCG consensus sequence. An enzyme that removes terminal instances of this molecule is mutated in a disease whose signs include cornea verticillata and angiokeratomas. An alpha-1,3 ("alpha-one-three") linkage between two of these molecules creates an antigen that can trigger an allergy to red meat. Fabry's disease is caused by an inability to remove this compound, and people with GALT mutations are unable to break down this compound, causing cataracts. This molecule undergoes mutarotation, phosphorylation and 4-epimerization in the Leloir pathway, which transforms this molecule to UDP-glucose. O-nitrophenyl bound to this molecule creates a detection reagent that turns yellow when LacZ ("lack-Z") is expressed. For 10 points, name this sugar combined with glucose to create lactose.  
ANSWER: **galactose** [or **gal**]

4. *Specific English word required.* In a long poem, a woman decries a version of this concept that resembles “a creeping skeleton with lamplike eyes” and acts like “a sponge drink[ing] water.” After asking whether Wisdom can be put in a silver rod, the “motto” of the *Book of Thel* asks if this concept can be put in a golden bowl. In a short poem titled for this concept, the speaker visits a place where he “used to play on the green” and sees it “filled with graves and tomb-stones where flowers should be.” One speaker claims that this concept “builds a Heaven in Hell’s despair,” while the other asserts it “builds a Hell in Heaven’s despite,” in “The Clod and the Pebble.” The speaker laments that a “dark, secret” version of this concept “destroys” the life of the title flower in “The Sick Rose.” William Blake is often read as a champion of the “free” form of, for 10 points, what concept restrained by the institution of marriage?

ANSWER: **love** [or self-**love**; or “The Garden of **Love**”]

5. The only use of the piccolo in this symphony is in the exposition, where it holds a muted D for a total of 11 measures. After its composer’s usual publisher only offered 1000 marks for it, this symphony was published by the London-based Novello & Co. In this symphony’s second movement, the flute introduces a theme that consists of three 32nd-note pickups into three repeated falling fourths. This so-called “English” symphony opens with cellos and mid-range winds playing a somber G-minor melody that gives way to a flute introducing the main “bird call” theme. The theme-and-variations finale of this symphony opens with a trumpet fanfare. This symphony premiered three years before the symphony that followed, whose second movement English horn solo inspired the spiritual “Goin’ Home.” For 10 points, name this G-major symphony that preceded *Symphony From the New World*.

ANSWER: Symphony No. **8** in G-major, Op. 88, B. 163 by Antonín **Dvořák** [prompt on partial answer]

6. It's not Spain, but ESMA, a company based in this country, was almost driven out of business after agreeing to accept streetlamp ads from left-leaning political parties. This country's government was blamed for passing a “slave law” that forced workers at auto plants to work overtime without a guarantee of prompt payment; its dependence on the German auto industry has led to its government being called an “Audi-tocracy.” Nationalists in this country have revitalized the rovás script, and its ruling party granted vote-by-mail rights to members of its majority ethnic group in Ukraine and Serbia but not to those living in Western Europe. This country was once home to Central European University, which was founded by a billionaire born in this country who “broke the bank of England” and who also created the Open Society Foundations. For 10 points, name this country whose Fidesz (“FEED-ess”) party is led by Viktor Orban.

ANSWER: **Hungary** [or **Magyarország**]

7. In a romance, this character gives a knight a goblet that fills with wine when its holder makes the sign of the cross. In that 13th-century *chanson de geste*, this son of Julius Caesar aids a knight on a quest to steal four teeth from the Emir of Babylon. This character titles the *magnum opus* by the author of the *History of Agathon*, the earliest *bildungsroman*. During Walpurgisnacht in *Faust: Part I*, Faust and Mephistopheles watch a masque about this character’s “golden wedding” to his wife. A poem titled for this character based on the medieval *Huon of Bordeaux* was written by Christoph Martin Wieland. Alberich in the *Nibelungenlied* is the equivalent of this character, who orders his servant to fetch a purple flower called “love-in-idleness” in another play. For 10 points, name this fairy king, the master of Puck and husband of Titania in *A Midsummer Night’s Dream*.

ANSWER: **Oberon** [or **Auberon**; accept **Alberich**]

8. A historical figure of this occupation lent his name to a faction of Polish conservatives who advocated “tri-loyalism” over nationalism in 1860s Krakow. Anna of Russia punished Prince Mikhail Golitsyn, a noble serving in this occupation, by forcing him to marry a Kalmyk woman and spend his wedding night in an ice palace. An iconic member of this profession from Polish history, Stanczyk, is depicted brooding in response to the capture of Smolensk in a painting by Jan Matejko. Theatrical depictions of this profession in Tudor England were influenced by Robert Armin, who built on previous portrayals by Will Kempe. The country of “Narragonia” is the destination of a company of these people in a satire by Sebastian Brant. For 10 points, identify this occupation of court entertainers who wore caps and bells while performing to amuse nobles.

ANSWER: court **jesters** [or **fools**; accept **clowns**; prompt on **comedians** or similar answers]

9. This man’s principles conflict with a desire for “a full barrel and a drunken wife” according to a text claiming that Europe wishes to have all the benefits of his system while retaining an “army of parasites.” That system named for this man is “inseparable from a specific mode of living and thinking and feeling life” and constitutes the “biggest collective effort to date to create, with unprecedented speed,” a “new type of man.” A text whose title references the U.S. and this man attempted to “to shift the superstructural analysis of hegemony back to its infrastructural origin” and argued that a system named for him was the “ultimate stage” of a response to the declining rate of profits by the industrial sector. Socialization of production and Taylorist principles are central to an “ism” popularized by Antonio Gramsci and named after, for 10 points, what industrialist whose assembly lines produced Model Ts?

ANSWER: Henry **Ford** [accept **Fordism**; or **Fordist** system]

10. This song concludes the original 1963 version of Dexter Gordon’s album *Our Man in Paris*. Visions of an “eskimo climbing up a moonbeam” and a “chicken with lips” terrify the narrator of Eddie Jefferson’s “vocalese” cover of this song. This was the last song Charlie Parker recorded in his first session as leader for Dial Records, which later released an outtake from that session under the title “Famous Alto Break.” Art Blakey, who claimed that this song was written on the top of a garbage can lid, recorded two Jazz Messengers albums titled for it. Featuring an early use of a syncopated bass line and originally titled “Interlude,” this song was written while its pouch-cheeked composer played with the Earl Hines band. For 10 points, name this Afro-Cuban jazz standard by Dizzy Gillespie whose title evokes a North African atmosphere.

ANSWER: “A **Night in Tunisia**”

11. Strengthening the T4 axiom to T6 entails restricting a function that has this property so that it maps to the unit interval; doing so creates the “perfect Hausdorff” kind of some spaces. The weakest algebraic topology in which a mapping has this property, and in which its associated points are closed, is named for Zariski. A space is considered normal if and only if, for every pair of disjoint sets, there exists a function that separates disjoint subsets that have this property, a result known as Urysohn’s Lemma. In the indiscrete topology, only constant-valued mappings have this property, while in the discrete topology, all functions have this property. If for every open set in a space, its preimage of a mapping is also open in the associated space, then the mapping has this property. For 10 points, what property is possessed by functions that do not have any “sharp” changes in value?

ANSWER: **continuous** [accept word forms like **continuity**]

12. Galway Kinnell's poem to this author recounts a reading where the audience paid him "almost total / inattention" except a giggle "when you spoke of a pig." This poet "loved the lotus cup . . . the wily mud . . . and the long stem of connection" according to a poem by his follower, Denise Levertov. Dream Song 324, "An elegy for [this poet] the lovely man," praises him for having "worked so hard" "for so many years." This poet is asked "what is death?" and "are you prepared to be reborn" in "Mescaline" by Allen Ginsberg, whose correspondence with this poet inspired Ginsberg to adopt free verse. A Carl Sandburg poem describes this author "delivering the brain-child / to wriggle in black ink on white paper" "In Rutherford New Jersey" and is titled "Good Babies Make Good Poems." For 10 points, name this obstetrician who wrote "Asphodel that Greeny Flower," *Paterson* and "This is Just To Say."  
ANSWER: William Carlos Williams

13. Linda Zagzebski's most recent book draws on Amy Olberding's "exemplarist" reading of this work, which analyzes this work's comparison of the "village worthy" to a "thief." A character in this work claims that he set his mind upon learning at fifteen, entered society at thirty, and became "free of doubts" at forty. The unusual twentieth and last section of this work, which quotes Emperor Shun and Tang of Shang, is labelled the "Yao Yue." This work begins by declaring, "To learn and then have occasion to practice what you have learned—is this not satisfying?" Its recurring characters include Zilu, Zigong, and Yan Hui. Alongside the *Great Learning*, the *Doctrine of the Mean* and the *Mencius*, this work was one of the "Four Books" memorized for imperial exams. For 10 points, name this collection of sayings about cultivating *ren* through gentlemanly conduct and filial piety, attributed to Confucius.  
ANSWER: *The Analects* [accept Lunyu]

14. In her early 2000s photographs like "Maja and Elodie," Sharon Lockhart posed people with sculptures from this movement. At the Young British Artists's 1997 *Sensation* exhibit, an Australian artist from this movement displayed an uncannily tiny sculpture of his late father titled *Dead Dad*. John De Andrea's nude sculptures and Ron Mueck's sleeping self-portrait *Mask II* are from this movement, as is a sculpture of a kneeling Hitler titled *Him* by Maurizio Cattelan. An artist from this movement depicted a camera-toting man in a Hawaiian shirt standing next to his wife in the 1970 sculpture *Tourists*. The sculptor Duane Hanson is part of this movement, whose equivalent painting style is used by the artist of *Telephone Booths* and by a quadriplegic artist known for his large, grid-based portraits. For 10 points, name this style employed by Richard Estes and Chuck Close.  
ANSWER: hyperrealism [or photorealism; or superrealism; prompt on realism]

15. After a ruler of this name saw his horse genuflect three times by a statue of the Madonna and Child on his return trip from Italy, he founded the Ettal Abbey. Another ruler of this name commissioned a 140-foot-tall rotunda called the Hall of Liberation at Kelheim and had his architect design busts for a patriotic "Temple of Fame and Honor" that he dubbed Walhalla. A king of this name recognized the end of his rule by giving the Anif Declaration, while another made a countess out of Eliza Gilbert, his mistress better known for performing the Spider Dance as Lola Montez. The end to 738 years of rule by the Wittelsbach Dynasty came when the third king of this name gave up power in 1918. For 10 points, identify the name of the king who ordered the building of Neuschwanstein Castle, and became known as the Swan King or the Mad King while ruling over Bavaria and patronizing Richard Wagner.  
ANSWER: Ludwig [or Louis]

16. This is the number of dimensions possessed by a superconformal field theory with (2,0)-supersymmetry. This is the number of magnetic poles needed to construct the simplest corrector for spherical aberrations in charged beams. For bremsstrahlung radiation parallel to the direction of motion, the emitted power is proportional to the gamma factor raised to this exponent. The tensor contraction of the Levi-Civita symbol in 3 dimensions with itself, with all indices being identical, equals this value. The electromagnetic tensor has this many independent components, which, as a consequence of symmetry, is also the number of independent components in the Cauchy stress tensor. The attractive term of the Lennard-Jones potential falls off as one over the radius raised to this number. For 10 points, give this number that counts the degrees of freedom possessed by a rigid body in 3D Euclidean space.

ANSWER: **6**

17. William Giauque first studied the magnetocaloric effect in a compound containing 13 equivalents of this compound. The observation of ammonia's substitution for one of these ligands in a chromium complex was the basis for the Eigen-Wilkins mechanism. That mechanism helps explain the associative interchange between metal centers and these ligands, a reaction exemplified by anation. Trivalent lanthanides form complexes containing either 9 or 8 of these ligands. In the mechanism of cisplatin, this ligand replaces one of the chlorides. The Jahn-Teller effect is often exemplified by copper bonded to six of these ligands. Metal complexes containing this ligand act as acids in reaction due to the ionizable nature of the proton. Methane is stored in clathrates composed of this molecule. For 10 points, identify this compound, which bonds to metal centers ionically to form hydrates or covalently to form "aquo" complexes.

ANSWER: **water** [or **H2O**; accept **Aqua** or **Aquo** before "aquo"; accept **hydrate** before "hydrates"]

18. This book argues that pragmatist philosophy inspired fascist poets like Ezra Pound to "regress to myth" by assuming "fictions are justified...by their practical effects." This book applies the scholastic concept of *aevum*, or angelic time, to characters in novels, and claims that Joachite transitions between ages have been replaced by a saeculum of "perpetual transition." This 1967 book examines how literature was changed by the "lengthening of the scale of history" in lectures like "The Modern Apocalypse." This book inspired the title of a novel whose protagonist visits a pub every Friday to meet a mentally handicapped man he suspects is Veronica's son, and puzzles over the equation  $b = s \text{ minus } v \text{ times or plus } a \text{ -one}$ . Eschatology's effects on fiction are explored in, for 10 points, what Frank Kermode book that shares its title with a novel about Tony trying to figure out Adrian's suicide, by Julian Barnes?

ANSWER: *The **Sense of an Ending**: Studies in the Theory of Fiction*

19. *Description acceptable.* Clergyman and amateur historian Mark Noble's reputation was damaged when he published a genealogy of these people in 1798. Historian Edward Vallance reported he nearly fell off a cliff while walking on a 16-mile hike named for these people. In the 19th century, Walter Scott and James Fenimore Cooper spread the legend of the "Angel of Hadley," one of these people who defended that town from a Native American attack. Judges Cave is named for an incident in which two of these people, William Goffe and his father-in-law Edward Whalley, hid from authorities. Many of these people fled abroad after the actions of George Monck resulted in the Declaration of Breda. These people were explicitly not pardoned by the Indemnity and Oblivion Act of 1660. For 10 points, name these people who tried and executed a monarch during the English Civil War.

ANSWER: **regicides** of King Charles I [accept anything along the lines of the people who signed the **death** warrant of King **Charles I** or **judges** at the trial of **Charles I**; accept American **regicides**; prompt on **Roundheads**, or **felons**, or **Puritans**]

20. One member of this group was told to plant a walking stick in the ground and to water it every day until the stick bore fruit. Another member of this group encountered an out-of-place silver plate on a little-used road and was convinced it was a trick of the devil. Another of these people, a former robber, instructed people to “sit in your room in solitude, and your room will teach you everything,” as quoted in the *Apophthegmata* (“apo-THEG-mata”), or “collected sayings,” of these people. Members of this group included John the Dwarf and Moses the Black. Athanasius of Alexandria wrote a popular biography of one of the earliest of these people, who buried Paul of Thebes. A member of this group who grew up in Egypt was tormented by demons in the form of wild animals. For 10 points, name this group of early ascetics, including Saint Anthony, who lived in Egypt and began Christian monasticism.

ANSWER: **desert fathers** and mothers [prompt on monks or hermits or the fathers]

## Bonuses

1. The organization headed by this man was responsible for the assassination of ambassador Shlomo Argov in London, leading to the 1982 invasion of Lebanon. For 10 points each:

[10] Identify this namesake of a splinter group that rejected the 10 point program of the Palestine Liberation Organization. His nom de guerre translates to “father of the struggle.”

ANSWER: **Abu Nidal** [or Sabri Khalil **al-Banna**]

[10] Abu Nidal had a falling out with this longtime leader of the PLO, who signed the Oslo Accords with Yitzhak Rabin. He also participated in the Camp David Summit with Bill Clinton and Shimon Peres.

ANSWER: Yasser **Arafat**

[10] The Abu Nidal organization was particularly infamous for simultaneous attacks on two airports in December 1985 using assault rifles and hand grenades. Name either city in which those attacks took place.

ANSWER: **Rome** or **Vienna**

2. This novel’s title was partially inspired by an Odilon Redon painting that its author saw as a child, and is referenced in a scene where the wine merchant Norbert poses a question to his young daughter. For 10 points each:

[10] Name this novel in which the eccentric heiress Mary Hare lives on the decaying estate of Xanadu outside of the suburb of Sarsaparilla, home to the devout mother Ruth Godbold and the artist Alf Dubbo.

ANSWER: ***Riders in the Chariot***

[10] *Riders in the Chariot* was written by this Australian writer who wrote *The Tree of Man* and a novel about a German explorer’s attempt to traverse Australia, *Voss*.

ANSWER: Patrick **White**

[10] After winning the 1973 Nobel Prize in literature, White set up a namesake literary award in Australia, the first of which went to this writer of *The Puzzleheaded Girl* as well as a novel about the dysfunctional Pollit family.

ANSWER: Christina **Stead** (That novel is *The Man Who Loved Children*.)

3. This theorem states that the time derivative of the energy density plus the divergence of a vector  $\mathbf{S}$  equals negative current density dot E-field. For 10 points each:

[10] Identify this theorem whose namesake vector  $\mathbf{S}$  is given by the cross product of the E- and B-fields. It computes the power carried by an electromagnetic wave.

ANSWER: **Poynting** theorem

[10] The Poynting theorem can be used to define this quantity for the input to a passive two-terminal electromagnetic system. At low frequencies, its real and imaginary terms reduce to the volume integrals over the square of the electric field and the difference in magnetic and electric energy densities.

ANSWER: **impedance**

[10] The Poynting theorem, applied in the context of a scattering process, is used to derive this statement. It sets the total cross section equal to four pi over the wavevector all times the imaginary part of the scattering amplitude.

ANSWER: **optical** theorem



4. The composer of this symphony originally called its percussion-heavy third, seventh, and ninth movements “tâlas,” based on the concept of meter in Indian classical music. For 10 points each:

[10] Name this massive ten-movement symphony, the second part of its composer’s *Tristan* trilogy. It includes virtuosic parts for solo piano and solo ondes Martenot.

ANSWER: ***Turangalîla-Symphonie***

[10] This composer first employed the ondes Martenot in *Fête des belles eaux*, a piece scored for six of them. This composer also wrote the *Turangalîla-Symphonie* and *Quatuor pour la fin du temps*.

ANSWER: Olivier **Messiaen** [or Olivier Eugène Prosper Charles **Messiaen**]

[10] Claude Rostand compared this religious piece by Messiaen, to “an angel wearing lipstick.” Each movement of this piece, with parts for ondes martenot and 36 female voices, represents a different aspect of God’s presence.

ANSWER: ***Trois petites liturgies de la présence divine*** [or ***Three Small Liturgies of the Divine Presence***]

5. In 1960, the statistician Leo Breiman published a result known as the “geometric mean principle,” which was actually another form of this formula in disguise. For 10 points each:

[10] Identify this formula named for the Bell Labs engineer who discovered it. It gives the fraction of one’s total bankroll or assets that one should wager to maximize the expected geometric growth rate.

ANSWER: **Kelly** criterion [accept answers that include **Kelly** and indicate a formula or bet or strategy]

[10] Modern portfolio theory relies on both the Kelly criterion and this ratio, which quantifies an asset’s performance adjusted for risk. It is named for the economist who co-devised the CAPM.

ANSWER: **Sharpe** ratio

[10] An early statement of the Kelly criterion was found by a polymath from this Swiss family during his investigations into the St. Petersburg paradox. Binomial “trials” are named after another theorist from this family.

ANSWER: **Bernoulli** family [or the **Bernoullis**; accept Daniel **Bernoulli**, or Jacob **Bernoulli**, or **Bernoulli** trials]

6. One member of this group, the astronomer Thomas Harriot, is credited with devising the first method for calculating compound interest. For 10 points each:

[10] Give this name for a hypothesized intellectual circle of Elizabethan-era freethinkers led by Christopher Marlowe and Walter Raleigh. Their derisive name is spoken by Ferdinand, King of Navarre, in Act IV of a play.

ANSWER: The **School of Night** [accept The **School of Atheism**]

[10] Ferdinand mocks the “School of Night” in this “problem play,” which concludes with its four main female leads testing the chastity of its four principal male leads for a “year and a day.”

ANSWER: ***Love’s Labour’s Lost***

[10] Harriot is also credited with introducing this plant to the British Isles. Several hundred varieties of this member of genus *Solanum* have been created in the Andes, the region to which it is indigenous.

ANSWER: **potatoes** [accept **taters**; prompt on **tubers**; do not accept or prompt on “sweet potato(es)” or “yams”]

7. An entry in this series depicts a block of seats divided by a handrail; eerily, the seats to the left of the handrail are almost completely empty. For 10 points each:

[10] Name this set of 33 prints, one of which depicts some “unfortunate events” that killed spectators at Torrejón. Another entry in this 1816 series depicts a man named Martincho sitting in a chair with his feet shackled together.

ANSWER: *La Tauromaquia* [or **Bullfighting**; or **Bullfights**; do not accept “bullfighters”]

[10] *La Tauromaquia* was a series by this Spanish artist, who also used empty space to achieve unsettling effects in the drawings from his *Black Border Notebook*. His many other disturbing works include his *Black Paintings*.

ANSWER: Francisco **Goya** [or Francisco Jose de **Goya** y Lucientes]

[10] In this largely-empty entry from Goya’s *Black Paintings*, the title creature barely pokes its head up from a dark brown section at the bottom, and is engulfed in a mysterious pale yellow that dominates its top four-fifths.

ANSWER: *The Dog* [or *El Perro*; or *Drowning Dog*]



8. In “Can the Subaltern Speak?”, Gayatri Spivak calls the Othering of the colonial subject the “clearest available example” of this kind of action. For 10 points each:

[10] Name this practice that Spivak identifies with the subjugation of marginalized groups’ knowledge. A 2011 paper by Kristie Dotson is titled for “Tracking” this behavior and “Practices of Silencing.”

ANSWER: **epistemic violence** [prompt on violence; prompt on epistemic injustice]

[10] Dotson defines “reliable ignorance” as an incompetence characterized by this term. These conditionals about alternative situations generally take the form: “If it were the case that x, then it would be the case that y.”

ANSWER: **counterfactuals**

[10] Miranda Fricker’s *Epistemic Injustice* cites this philosopher’s critique of inferentialist accounts of testimony from his paper “Knowledge by Hearsay.” This University of Pittsburgh philosopher wrote *Mind and World*.

ANSWER: John **McDowell**

9. In a novel by this author, an interpreter realizes that his wife Isolde is still obsessed with her dead first husband, Tristan. For 10 points each:

[10] Name this contemporary Russian novelist who included many passages in question-and-answer format, representing Peter’s interrogations of people seeking asylum in his country, in the novel *Maidenhair*.

ANSWER: Mikhail (Pavlovich) **Shishkin**

[10] The asylum seekers in *Maidenhair* are trying to enter this country. Hermann Hesse emigrated to this country from Germany.

ANSWER: **Switzerland** [or **Swiss** Confederation]

[10] The Swiss author Robert Pinget, whose novel *The Inquisitory* consists entirely of the transcript of an interrogation, was a member of this movement that produced novels like *The Planetarium* and *Jealousy*.

ANSWER: **nouveau roman** [or **new novel**]

10. FITC and Alexa Fluor reporters are often used in this technique, which uses a DAPI counterstain to highlight nuclei. For 10 points each:

[10] Name this technique in which fluorescent antibodies are applied to fixed tissue to localize particular antigens.

ANSWER: **immunohistochemistry** [or **IHC**; prompt on immunostaining]

[10] Immunohistochemistry against alpha-fetoprotein is used to diagnose cancer of this organ. That cancer can be caused by Hepatitis C infection.

ANSWER: **liver**

[10] Another common reporter for immunohistochemistry and Western Blotting is this enzyme isolated from *Armoracia rusticana*, which oxidizes reporters like ABTS and DAB.

ANSWER: **horseradish peroxidase** [or **HRP**, prompt on peroxidase]

11. The general and historian Herennius Dexippos mounted a force of two thousand men to fight off these invaders, as documented in his lost books, the *Chronicle* and the *Scythica*. For 10 points each:

[10] Name this tribe of Scythian origin who sacked Athens in 267 CE, destroying many monuments including the Ancient Agora.

ANSWER: **Heruli** or **Herulae** [or **Herucli**; or **Hirii**]

[10] The invasion destroyed large portions of the wall around Athens that was named for this Roman emperor, whose reign came to an abrupt end in 260 CE when he was taken captive by Shapur I after the Battle of Edessa.

ANSWER: **Valerian** [or Publius Licinius **Valerianus** Augustus the Elder]

[10] Archaeologists are divided as to whether the Heruli also pillaged the countryside and this port of Athens, which was put under siege later when Sulla was chasing the tyrant Aristion.

ANSWER: **Piraeus**

12. In this video game, the player encounters cave paintings that show neurons merging into the circuit diagram of an anti-lock brake mechanism. For 10 points each:

[10] Name this short British video game about a grief-stricken man exploring an island in the Hebrides. Voiceovers in this game read out increasingly unreliable fragments of letters to the title character.

ANSWER: **Dear Esther**

[10] Dear Esther was one of the groundbreaking games in this genre, whose later members include *Gone Home* and *Firewatch*. GamerGate supporters criticized these games for being overly artistic and lacking interaction outside of the title activity.

ANSWER: **walking simulator** [prompt on **walking game** or similar]

[10] Dear Esther was developed by a company named The Chinese Room, in reference to John Searle's thought experiment against "strong" forms of this. Video games with realistic NPC behavior are said to have good [this].

ANSWER: **Artificial Intelligence**

13. These people organized an 1824 revolt to protest occupation of their land, preparing to fight by drinking a poison called datura in their secret *antap* ceremony. For 10 points each:

[10] Name these people who navigated the Pacific Ocean in long plank canoes called *tomol*, which they used to collect Olivella shells from the North American Channel Islands.

ANSWER: **Chumash**

[10] The Chumash lived in what is now this U.S. state, where Junipero Serra founded several missions to convert the native people.

ANSWER: **California**

[10] In the late 19<sup>th</sup> century, these native people of northern California fought the U.S. Army in the lava beds around Lake Tule. These close relatives of the Klamath were forcibly relocated to Oklahoma after the war.

ANSWER: **Modoc** [accept **Modoc War**]

14. Using DFT, Zhu and Sola showed that metal clusters also obey this rule. For 10 points each:

[10] Name this rule which, contrary to Huckel's rule, says that the lowest triplet state of a planar cyclic hydrocarbon will be aromatic when it has  $4n$  pi electrons, and anti-aromatic when it has  $4n+2$  pi electrons.

ANSWER: **Baird's rule**

[10] A triplet dianion of this molecule was recently shown to display Baird aromaticity. This aromatic hydrocarbon has formula  $C_6H_6$ .

ANSWER: **benzene**

[10] Baird's rule is applied to these monocyclic aromatic hydrocarbons, which by definition have the maximum number of non-cumulated double bonds. They are written with the number of carbons in brackets as a prefix.

ANSWER: **annulenes**

15. In a Stewart Home novel, the suicidal Alan reads a book on *69 Things to do with this woman* while visiting Aberdeen University. For 10 points each:

[10] Name this woman whose wedding is contrasted with the needle-sharing "buggery" of Baz Hallward and the protagonist of Will Self's *Dorian, An Imitation*.

ANSWER: Princess **Diana** [or **Princess of Wales**, or Diana **Spencer**]

[10] Will Self wrote the introduction to this author's postmodern detective novel *Hawksmoor*. In another mystery novel, a dictaphone is used to play the voice of a murder victim who shares a surname with this author.

ANSWER: Peter **Ackroyd** [or Roger **Ackroyd**]

[10] The psychogeography of Nicholas Hawksmoor's churches is also explored in *From Hell*, a graphic novel about the Whitechapel murders by this writer who is better known for creating *Watchmen*.

ANSWER: Alan **Moore**

16. In 2005, the classicist Adrienne Mayor inaugurated “the folklore of paleontology,” or the study of how fossils have shaped myths. For 10 points each:

[10] A book by Mayor discusses how this monster was likely inspired by the fossils of *Protoceratops* in Scythia. Heraldry often made use of this majestic animal, which has the head of a lion and the body of an eagle.

ANSWER: **griffin** [or **gryphon**]

[10] Mayor discusses how ammonites, or the so-called “snake stones” of what is now this country, inspired the story of its saint Hilda petrifying snakes. The Kellas cats here inspired the legend of the spectral, soul-stealing *Cait Sith*.

ANSWER: **Scotland** [prompt on Great **Britain** or the **United Kingdom**]

[10] Dinosaur footprints in Geibei and Liaoning, China likely inspired the stories of these creatures, a golden variety of which are called *jinji*. The mythical *luan*, which wears snakes on its breast as it prances around, is one of these.

ANSWER: (golden celestial) **chickens**

17. In the second of this poem’s five nine-line stanzas, the speaker proclaims, “The wild thorns grow tame / and will do nothing to oppose the flame / your lacerations tell the losing game.” For 10 points each:

[10] Name this poem from *Lord Weary’s Castle*. Its speaker asks Josiah Hawley to picture “a brick-kiln where the blast / fans your quick vitals to a coal,” before adding, “the blaze / is infinite, eternal: this is death.”

ANSWER: “**Mr. Edwards and the Spider**”

[10] This descendant of Jonathan Edwards wrote four poems about the theologian, including “Mr. Edwards and the Spider.” The speaker proclaims, “I myself am hell” in this man’s poem, “Skunk Hour.”

ANSWER: Robert **Lowell**

[10] Many critics believe that the “wonderful one-hoss shay” that “ran a hundred years to the day,” described in this poem by Oliver Wendell Holmes, is a reference to Edwards’ theology.

ANSWER: “The **Deacon’s Masterpiece** or, the Wonderful ‘One-Hoss Shay’: A Logical Story”

18. Surah 111 predicts that this man will burn in hell along with his wife Umm Jamil, who, according to tradition, used to throw thorns in Muhammad’s path. For 10 points each:

[10] Name this uncle and fierce opponent of the Prophet Muhammad. His common name, meaning “father of flame,” was given to him because of his anger and red complexion.

ANSWER: **Abu Lahab** [or **Abd al-Uzza** ibn Abd al-Mutallib]

[10] Like Muhammad, Abu Lahab was born into the Banu Hashem clan of this larger tribe, which controlled the city of Mecca.

ANSWER: the **Quraysh**

[10] As leader of the Hashemite tribe, Abu Talib was also the custodian of this granite cube-shaped building in Mecca, which the Quran states was built by Ibrahim and Ismail.

ANSWER: the **Ka’aba**

19. This quantity was measured using time delay cosmography by the H0LICOW (“holy cow”) XIII collaboration led by Wendy Freedman. For 10 points each:

[10] Identify this quantity that parametrizes how fast the universe is expanding. There is an over 5 standard deviation discrepancy between the measured values of this quantity in the early universe and late universe.

ANSWER: **Hubble**-Lemaître parameter [or **Hubble**’s constant; prompt on **H0**]

[10] These Population II stars may be used as standard candles instead of Cepheid variables. These stars have an I-band absolute magnitude of approximately -4.0, a value that is nearly independent of their age or metallicity.

ANSWER: **tip** of the **red giant branch** stars [or **TRGB** stars]

[10] These events have been proposed as standard sirens to measure the Hubble parameter. In August 2017, LIGO and Virgo detected gravitational waves from one of these events that typically also produce a short gamma ray burst.

ANSWER: **kilonovas** [or binary **neutron star mergers**; prompt on answers referring to bursts of **gravitational waves**]

20. John Eliot's biography of this man *in an Age of Decline* seeks to reclaim his reputation as a statesman from obscurity, and compares him to his contemporary rival Cardinal Richelieu. For 10 points each:

[10] Name this Spanish court favorite of King Phillip IV, who served as prime minister from 1621 to 1643.

ANSWER: Gaspar de **Guzmán**, Count-Duke of **Olivares** [accept either underlined part]

[10] Olivares provoked the Reapers War in Catalonia as a result of this plan, which he first proposed in 1625. This policy required all Spanish territories including those in Italy to provide a fixed quota of soldiers to the king, pledging them to support Castile.

ANSWER: the **Union of Arms**

[10] The Union of Arms also encouraged revolt in Portugal, where Philip's crown was offered to King John IV, the duke of this region. This dynasty would rule Portugal until 1910.

ANSWER: **Braganza** House/Dynasty [or **Brigantine** Dynasty]