

Tossups

1. **This group named its official magazine *Piedmont* out of admiration for Piedmont’s accomplishments under the House of Savoy. Several members of this group were found guilty and executed at the Salonika Trial. This group’s logo shows a bottle, dagger, grenade, and flag bearing a skull and crossbones. Its founder gained notoriety for leading the group of officers who carried out the May Coup against Queen Draga and her husband (*) Alexander I and was known by the nickname “Apis.” Dragutin Dimitrijević (“DRAH-goo-teen dee-mee-TREE-yeh-vich”) led this group, which orchestrated an event that was carried out by members of Young Bosnia in Sarajevo. For 10 points, name this revolutionary secret society from Serbia, best known for its links to the assassination of Franz Ferdinand.**

ANSWER: **Black Hand** [or **Crna ruka**; or **Unification or Death** or **Ujedinjenje ili smrt**]

<Continental post-600 History, NB>

2. **Proving inequalities named for this property for a non-zero vector potential allows the extension of constraints on moments of negative eigenvalues of Schrödinger operators, called Lieb–Thirring inequalities. At standard conditions, pyrolytic (“PIE-roh-lit-ik”) graphite possesses a stronger example of this property than any other known material, followed by bismuth. Since the electrons of materials with this property form small (*) current loops, this property can be described as an atomic scale application of Lenz’s law. Since there is no opposition to the formation of such loops in superconductors, they exhibit this property perfectly in the Meissner effect and thus have a susceptibility of negative one. For 10 points, give this property of materials that induce a magnetic field that opposes an exterior, applied magnetic field.**

ANSWER: **diamagnetism** [or word forms such as **diamagnetic** materials; accept **Landau diamagnetism**; accept **negative susceptibility** before “susceptibility”; do not accept or prompt on “magnetism” or “magnetization” or “ferromagnetism” or “paramagnetism”]

<Physics, WA>

3. **A character in this musical freezes with his hands on his nipples while two other characters debate over word choices like “I like my parents.” This musical’s protagonist improvises the line “Grab a scoop at À La Mode” while making up a story based on a bowl of apples on a dinner table. In the final number of its first act, videos are projected onto the stage of people waving signs reading “#YouWillBeFound.” In this musical, a boy who had signed the title character’s (*) cast in the computer lab points out that, rather than falling out of a tree, the title character let go in a suicide attempt. A letter reading “It turns out today won’t be a wonderful day after all” lights up the stage in this musical as the title character admits he invented a friendship with Connor Murphy. For 10 points, name this 2017 musical about a socially-anxious high school student who is catapulted into popularity after an acquaintance kills himself.**

ANSWER: **Dear Evan Hansen**

<Other Art: Misc Auditory, JC>

4. **A poet from this country experimented with a “synthetic” form of his native tongue in late poems, such as those collected in *Second Hymn to Lenin and Other Poems*. That poet from this country wrote that its people were the only ones who “deem their ignorance their glory” in a poem about “a drunk man” who looks at the title plant. Another poet from this country asks “O what is death but parting breath?” and describes a man who “play’d a spring... Below the gallows-tree” in a poem styled as an (*) outlaw’s “farewell.” That poet from this country says he was “sorry that Man’s dominion / Has broken Nature’s social union” in a poem about a creature that “art blessed, compared with me.” A “Wee, sleeket, cowran, tim’rous beastie” is the addressee of a poem from**

this country about the “best laid schemes o’ Mice an’ Men.” For 10 points, name this home of Hugh MacDiarmid (“muk-DEER-mid”) and Robert Burns.

ANSWER: **Scotland** [prompt on United Kingdom or UK or Great Britain; do not accept or prompt on “England”]
<Non-Epic Poetry, EL>

5. Edward Gibbon writes that this emperor noted the inability of a throne to afford “lasting satisfaction” in saying that he had “been all things... and all was of little value.” This emperor came to power by deposing a Senator who, possibly as a joke, outbid everybody else for the support of the Praetorian Guard. This emperor died of complications related to his gout shortly after building a base on the River Tay during a successful campaign against the Caledonians. He built a triumphal arch in his hometown of (*) Leptis Magna to commemorate a visit and defeated rival claims by both Pescennius Niger and Clodius Albinus. This emperor gave the title of “Augustus” to both his younger son Geta and his elder son Caracalla. For 10 points, name this surviving emperor from the Year of the Five Emperors who founded a namesake dynasty.

ANSWER: **Septimius Severus** [or Lucius **Septimius Severus** Augustus; prompt on partial answer]
<Ancient History, WA>

6. This woman is played by Maura Tierney in a 2017 production by the Wooster Group that dramatizes a debate centering on the essay “The Prisoner of Sex.” The film *Town Bloody Hall* covers that debate, in which this woman headlined a panel that opposed Norman Mailer. At the 2018 Hay festival, this thinker caused controversy by claiming that most rape is “lazy, careless, and insensitive” and equating it with “bad sex.” A 2015 petition at Cardiff University called for this thinker to be disinvited for expressing transphobic views. In her (*) 1970 magnum opus, this thinker claimed that women do not grasp “how much men hate them” and argued that traditional families starve women of their sexual desires, turning them into the title neutered figures. For 10 points, name this Australian feminist who wrote *The Female Eunuch*.

ANSWER: Germaine **Greer**
<Other/Misc Academic, WA>

7. Paul McCartney styled his first classical music album as a piece in this genre named for Liverpool. A piece in this genre first describes its title figure, who is named after a protest novel by Ödön von Horváth (“UR-durn von HOR-vaht”), in its movement “A star rises in midwinter.” Five African-American songs, including “Go Down, Moses,” are quoted in one of these pieces partially written in response to Kristallnacht. This is the genre of (*) Michael Tippett’s piece *A Child of Our Time*. Edward Elgar insisted that his piece based on a Cardinal Newman poem, titled *The Dream of Gerontius*, was not a work in this genre, though concert programs usually label it as such. In the best-known English-language piece in this genre, lines such as “King of Kings / And Lord of Lords” are repeated during the “Hallelujah” chorus. For 10 points, identify this genre of George Handel’s *Messiah*.

ANSWER: **oratorios** [accept *Liverpool Oratorio*]
<Classical Music/Opera, WA>

8. The operators *F*, *G*, *H*, and *P* are used in a logic for this concept founded by Arthur Prior. A 1908 paper on this concept notes that the sequence “M, N, O, P” could just as well have been “P, O, N, M”; that paper also observes that if this concept is defined by a one-place relation, then it is contradictory, but if it is defined by a two-place relation, then it is insufficient. The “growing block” theory of this concept uses its (*) “A-series” definition, which J. M. E. McTaggart contrasted with the “B-series” to conclude that this concept was unreal. The motion of an arrow becomes impossible if this concept is repeatedly partitioned, as observed by Zeno of Elea. A paradox in which an individual murders their grandfather before the birth of their parents may result from traveling through, for 10 points, what concept that distinguishes past, present, and future?

ANSWER: **time** [or **tense**; accept **temporal logic** or **tense logic**]

<Thought, KL>

9. The WW or rsp5-domain preferentially binds to proteins rich in this unmodified amino acid. A helix containing repeating residues of this amino acid is used as a molecular ruler to calibrate FRET efficiency measurements. The slow interconversion between isomers of this amino acid's aliphatic side chain tends to impede native protein folding. This amino acid, which locks a peptide bond's phi angle to about -65 degrees. This amino acid is the common denoting point for the first residue of an alpha helix sequence. Along with (*) glycine, this amino acid is commonly seen in beta turn sequences. A structure named "poly-[this amino acid]" comprises the majority of the secondary structure of collagen. Due to steric hindrance, this amino acid is almost never found within an alpha helix. For 10 points, name this amino acid whose side chain is the only one to bind to its amine group forming a five-membered ring, with symbol P.

ANSWER: proline

<Biology, JC>

10. This character claims that life affirmed his preference for soldiers over philosophers after reading *Sartor Resartus* and *Ride to Khiva*. This character describes the East as "perfumed like a flower, silent like death, dark like a grave" in that story, in which he works for Captain Beard. In a novel, after this character defends another man's "unsound method," he appreciates having "at least a choice of nightmares." In that novel, this character hopes that his "aspect was not so" "unappetizing" to (*) cannibals whose restraint he contrasts with a man who puts severed heads on poles. This character, who rescinds the postscript "Exterminate all the Brutes!" from a report, is unsettled by another character's last words, "The Horror! The Horror!" For 10 points, name this character hired to rescue Kurtz in Joseph Conrad's *Heart of Darkness*.

ANSWER: Charles Marlow [accept either name] (The first two clues are from "Youth.")

<Misc. Lit, EL>

11. This character remains unmoved against the desperation of his elderly father, who pathetically tears out his own grey hairs, and of his weeping mother, who undoes her robe and bares her breast. This is the only character to whom the epithet *koruth-aiolos*, or "of the shining helmet," is given. In his final moments, this character becomes terrified and runs past the hot and cold springs of the river (*) Scamander three separate times; on the fourth time, he is comforted by a hallucination of his brother Deiphobus ("day-FOH-bus") and resolves to turn around and fight with honour. The *Iliad* closes with the funeral of this character, whose corpse had spent twelve days being dragged in the dirt and defiled by his slayer Achilles. For 10 points, name this eldest son of Priam and the crown prince of Troy.

ANSWER: Hector

<Mythology, KL>

12. A character truly comprehends this title place during a moment in which he has a "majesty" like the King of Beasts and has an expression of "blissful ecstasy" on his wrinkled face. In that story titled for this place, the same man tries to improve his work by having a horned owl attack one of his students. A landmark in this place called the Mountain of Needles is mentioned in a story that ends with a man drowning in a lake as he is being watched by the (*) Buddha. An artist experiences this title place by watching the burning of a nobleman's carriage while his daughter and her monkey are inside. Kandata is stuck in this place after he selfishly denies others the chance to escape it using the title object in the story "A Spider's Thread." For 10 points, identify this place that the painter Yoshihide ("yo-shee-hee-day") depicts on a folding screen in a Ryunosuke Akutagawa story.

ANSWER: hell [or the underworld or jigoku; accept any answer indicating Buddhist hell; accept "Hell Screen" or Jigokuhen]

<Short Fiction, WA>

13. Many examples of these places called *darul uloom* (“DAR-ul uh-LOOM”) throughout South Asia are modeled on the influential one of these places in the town of Deoband in Uttar Pradesh. *Tarbiyyah* is offered by the more than 100 examples of these places in the city of Bradford in the UK. The most highly revered examples of a specific type of these places called a *hawza* are found in (*) Qom and Najaf. These places are not mosques, but are often created as a result of *waqf*, and are where people are introduced to *qiyas* and *aql* to become part of the *ulama*. The oldest of these places in Egypt is called as Al-Azhar. For 10 points, name these Islamic institutions where both theology and secular disciplines may be learned by students.

ANSWER: madrasah [or madaris or Islamic universities or Islamic schools or Islamic seminaries]

<Religion, AK>

14. Michelangelo gifted Tommaso de’ Cavalieri a set of four artworks in this medium, one of which shows horses tumbling in the title *Fall of Phaeton*. Artworks in this medium, which are housed in the *Gabinetto of the Uffizi* (“oo-FEET-see”), include Verocchio’s *Head of a Woman*. During the *paragone* debate of the *quattrocento* (“KWAH-troh-CHEN-toh”), Florentine artists who emphasized a train named for the Italian word for this medium opposed the *colorito* associated with Titian. Works in this medium often served as *modelli* for (*) paintings. Large scale works in this medium are called *cartone*. An artwork in this medium illustrates principles from *De Architectura* about human proportion by using a circle and square to bound two superimposed images of a standing man above mirror writing. For 10 points, Leonardo da Vinci’s *Vitruvian Man* is what type of artwork, which are done with chalk or charcoal on paper?

ANSWER: Renaissance drawings [or disegno or sketches; accept cartoons or cartone until “cartone”]

<Painting/Sculpture, AK>

15. Most of the Yamasee (“YAH-muh-see”) refugees of a war fought in 1715 fled to this colony after being defeated by Charles Craven. This colony’s Bay of Ochuse (“oh-CHOO-say”) was abandoned by Europeans for 137 years after Tristán de Luna failed to establish a settlement there. Forces from this colony [emphasize] *lost simultaneous battles at Bloody Marsh and Gully Hole Creek, forcing its parent country to recognize a neighboring colony led by (*) James Oglethorpe*. This colony’s northern border was established in a treaty that granted the US navigation rights to the Mississippi River, known as Pinckney’s Treaty. This colony, which was ceded to the US by the Adams–Onís Treaty, contains the oldest continuous European settlement in the US. St. Augustine was founded in, for 10 points, what colony whose city of Pensacola was occupied in 1814 by Andrew Jackson?

ANSWER: Spanish Florida [or La Florida]

<US History, EL>

16. MODIS (“MO-diss”) has superseded AVHRR instruments that detect the effects of this phenomenon. The active cavity type of one device is used to measure the TSI that results from this phenomenon. Synthetic aperture radar is a technique in an “active” paradigm defined by [emphasize] *not using the presence of this phenomenon*. According to one equation, temperature change equals climate sensitivity times the difference in the incoming and outgoing magnitude of this phenomenon, a parameter known as (*) climate forcing. Passive remote sensing is distinguished from active remote sensing through utilizing the presence of this phenomenon. Observations of this phenomenon led to the discovery of Fraunhofer lines. This phenomenon appears to converge at a point behind cloud cover when forming crepuscular rays. For 10 points, name this phenomenon that takes about 8 minutes to reach Earth.

ANSWER: sunlight [or solar radiation; prompt on light or radiation or infrared radiation by asking “from what general phenomenon?”]

<Other Science: Earth, AK>

17. *Description acceptable.* A paper by Uri Gneezy (“OO-ree g’NEE-zee”) et al. explains differences in competitiveness between the Khasi and Maasai by noting that Khasi society has this property, but Maasai society does not. The society of the Garo, whose members wear up to fifty earrings, has this property, as shown by the importance that it places on the *nokmechik*. Among six systems identified by Lewis Henry Morgan, only the Crow system is typically used by societies with this property. Friedrich Engels argued that all societies originally had this property in his treatise on the origin of the (*) family, drawing on Morgan’s work on kinship in the Iroquois longhouse. Reform Jewish communities do not have this property, but traditional ones do, as *halakhah* states that Judaism is passed down only in this manner. For 10 points, give this term for tracing descent through maternal ancestry.

ANSWER: matrilineal [accept word forms like matrilineality; accept answers indicating that ancestry is traced via the mother’s side of the family before “maternal”; do not accept or prompt on “matriarchal” or “matriarchy”]

<Social Science: Anthropology, WA>

18. The “Ottawa Initiative on” this country allegedly plotted a coup d’état against a president who was targeted by the “Cannibal Army” of guerillas. The people of this country were said to be “so familiar with their head of state” in a quote cited in *The Missionary Position* by Christopher Hitchens to criticize Mother Teresa. The US carried out Operation Uphold Democracy to restore this country’s first democratic government, elected in 1990. The US Air Force flew this country’s dictator and his wife (*) Michèle Bennett to Paris in 1986, allowing them to live on their ill-gotten gains. Jean-Bertrand Aristide became this country’s first democratically elected president following the reigns of two rulers who used the *Tonton Macoutes* paramilitary force. For 10 points, name this Caribbean country ruled by both Jean-Claude and François Duvalier.

ANSWER: Haiti [or Republic of Haiti]

<World History, EL>

19. This city is the setting of a novel that follows Lea, a “Lifer” with the genetic ability to live forever as long as she stays healthy and successful in her career. This city is the setting of Rachel Heng’s *Suicide Club*, as well as a novel in which Lianne periodically sees a performance artist in a business suit suspending himself upside down and in midair. In another novel set here, Russian hackers try to take down a server farm owned by Gabriel Ice. Keith abandons his career and family to play professional poker after surviving the framing (*) incident of a novel set in this city; the same incident here serves as the climax of Thomas Pynchon’s *Bleeding Edge*. A key left inside a vase leads the precocious Oskar Schell on a scavenger hunt around this city in Jonathan Foer’s novel *Extremely Loud and Incredibly Close*. For 10 points, name this city, the setting of Don DeLillo’s *Falling Man*.

ANSWER: New York City [or NYC]

<Long Fiction, JC>

20. This quantity can be calculated by setting the negative averaged exponential of the interaction parameter proportional to a parameter symbolized capital-B-sub-*i* that is known as the insertion parameter. An integral containing a function of screening charge density is used to calculate this quantity in COSMO-RS. For a real gas, this quantity is equal to its standard state variety plus *RT* times the fugacity. According the Gibbs phase rule, since the phases are in thermodynamic (*) equilibrium, this quantity must be equal for both phases. The Gibbs–Duhem equation expresses changes in this quantity with respect to temperature and pressure. This quantity is formally defined as the partial derivative of internal energy with respect to the component. For 10 points, name this quantity, symbolized mu, that represents the change in energy when particles are added or released in a reaction.

ANSWER: chemical potential

<Chemistry, RRP>

Bonuses

1. Camargo Guarnieri, a composer from this country, quit using his birth name “Mozart” early in his career because it became the subject of too many puns. For 10 points each:

[10] Name this country whose street musicians originated a genre of typically sorrowful song called the *choro* (“SHOW-roo”) that often accompanies a dance called the *maxixe* (“mah-SHEE-shee”).

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

[10] This composer of 14 *choros* is Brazil’s greatest classical composer. He fused its native music styles with Baroque forms in his various *Bachianas Brasileiras* (“bah-shee-AH-nuss brah-zee-LAY-russ”).

ANSWER: Heitor **Villa-Lobos** (“ay-TOR vee-luh-LOH-boos”)

[10] Guarnieri titled his Second Symphony after this tone poem by Villa-Lobos, which Serge Lifar (“SER-gay lee-FAR”) adapted into a ballet. A flute and soprano sax quote Debussy’s *Syrinx* in this tone poem that depicts the legend of the musician wren, a Brazilian bird that natives say lures people into the forest.

ANSWER: **Uirapuru** (“WEE-rah-poo-ROO”)

<Classical Music/Opera, WA>

2. This treatise describes how “complex ideas” are formed from a number of “simple ideas,” yet are, “when the mind please, considered each by itself, as one entire thing.” For 10 points each:

[10] Name this treatise that introduced the position that the mind is a *tabula rasa*.

ANSWER: *An **Essay Concerning Human Understanding***

[10] *An Essay Concerning Human Understanding* is by this Enlightenment-era British philosopher who laid the foundation for social contract theory in his *Two Treatises of Government*.

ANSWER: John **Locke**

[10] The first example of a “complex idea” cited by Locke is this concept, which is later noted in the treatise as arising from “a certain composition of colour and figure.” David Hume wrote that this concept is “no quality in things themselves: It exists merely in the mind which contemplates them.”

ANSWER: **beauty**

<Thought, WA>

3. These devices allow analysis of very small amounts of reactant, but require dead times of at most a couple milliseconds. For 10 points each:

[10] Name these devices in which the output of drive and reservoir syringes are mixed before being arrested by the namesake syringe, triggering data collection.

ANSWER: **stopped-flow** apparatus

[10] Near the observation chamber, stopped-flow apparatuses often have detectors for this phenomenon, in which a substance absorbs light and emits it a longer wavelength. It occurs faster than phosphorescence.

ANSWER: **fluorescence**

[10] Experiments using stopped-flow apparatuses can rely on isosbestic (“ICE-us-BEST-ic”) points, or wavelengths for which this quantity remains constant throughout a reaction. In circular dichroism (“dye-CROW-ism”), ellipticity is proportional to the difference in this quantity, symbolized capital A, between left-handed and right-handed polarization.

ANSWER: **absorbance**

<Chemistry, AK>

4. This text’s account of the Last Supper ends with Jesus rebuking all but one of his ignorant and blasphemous disciples, and then leaving for “another great and holy generation.” For 10 points each:

[10] Name this religious text that was re-discovered at a Geneva black market in 1983. It was first translated from its original Coptic by *National Geographic* in 2006.

ANSWER: **Gospel of Judas**

[10] The Gospel of Judas was written by this esoteric Christian sect that believed Jesus to be an emanation of the ultimate, absolute, secret god, sent to save humanity from the lesser, wicked Christian god.

ANSWER: **Gnosticism** [or **Gnostics**; or word forms]

[10] Gnostics rejected the physical world via ascetic acts such as this practice of abstaining from food or drink.

ANSWER: **fasting** [or the **fast**; or word forms]

<Religion, KL>

5. Following the successful Battle of Yamana, this caliph oversaw the compilation of the Qur'an into a single manuscript. For 10 points each:

[10] Name this caliph whose ascension caused a schism between his supporters and those who supported a man reputedly addressed as “mawla” at Ghadir Khumm.

ANSWER: **Abu Bakr** [or **Abū Bakr** aṣ-Ṣiddīq ‘Abdallāh bin Abī Quḥāfah]

[10] The Battle of Yamana took place during these wars, which Abu Bakr waged on rebellious tribes who refused to pay *zakat* tithes to the caliphate.

ANSWER: **Ridda** Wars [prompt on Wars of **Apostasy**]

[10] The early phase of the Ridda Wars included a siege against this city led in part by Tulayma, a man who claimed to be a prophet. Tulayma earlier took part in the Battle of the Trench, a siege of this second-holiest city in Islam.

ANSWER: **Medina** [or **Madinah**]

<World History, EL>

6. This essay argues that most criminals are not “marvelous Macbeths or villainous Vautrins” but what any “respectable, commonplace” person would be if they did not have enough to eat. For 10 points each:

[10] Name this essay that uses the punishments for crimes against property and against people as evidence that “man’s personality has been absorbed by his possessions.” This essay also asks “Who taught them the trick of tyranny?” while discussing public corruption of art.

ANSWER: “The **Soul of Man Under Socialism**”

[10] “The Soul of Man Under Socialism” is an essay by this author of “De Profundis.” His only novel is *The Picture of Dorian Gray*.

ANSWER: Oscar **Wilde**

[10] In “The Soul of Man,” Wilde claimed that “the note of rebellion is sometimes too strong” in this poet’s work, which includes a poem that ends “If Winter comes, can Spring be far behind?”

ANSWER: Percy Bysshe **Shelley**

<Misc. Lit, EL>

7. These companies often participate in “peering” with each other, transferring data through each others’ networks free of charge. For 10 points each:

[10] Name these companies that more than 40 percent of Americans only have one choice of, according to the Institute for Local Self Reliance. These companies, which include Cox and Comcast, have benefited from the FCC’s partial repeal of the Open Internet Act in 2017.

ANSWER: **ISPs** [or **internet service providers**; prompt on **telecommunications** or **telecom** companies]

[10] ISPs rely on these systems, such as Akamai (“ACK-uh-my”) or Cloudflare, for connections with high bandwidth and availability. These systems consist of geographically distributed edge servers that aggressively cache assets, such as jQuery, Bootstrap, images, or fonts, that are needed by many websites.

ANSWER: **CDNs** [or **content delivery network**]

[10] Although CDNs provide nearby servers, ISPs still have to solve this two-word problem named for a distance, which involves providing a physical link to the user so that they can access the internet. This term was later adopted in transportation engineering.

ANSWER: **last mile** problem [or **last kilometer** problem]
<Other/Misc Academic, AK>

8. In cooperation with the CIA's project MKUltra, British psychiatrist William Sargant attempted to brainwash patients by administering these things and then using insulin to induce a coma. For 10 points each:

[10] Identify these things that were administered by experimental subjects to "learners" in a study that Stanley Milgram conducted at Yale.

ANSWER: electric **shocks**

[10] This one-time president of each of the American, Canadian, and World Psychiatric Associations used shock therapy as part of the three-stage brainwashing treatment that he developed with MKUltra. Naomi Klein's *The Shock Doctrine* draws a comparison between this man's treatments and economic shock therapy.

ANSWER: Ewen **Cameron** [or Donald Ewen **Cameron**]

[10] MKUltra also notoriously experimented with this drug on patients, such as by giving it to unsuspecting men in brothels in the appropriately-named Operation Midnight Climax.

ANSWER: **LSD** [or lysergic **acid** diethylamide]

<Social Science: Psychology, WA>

9. Along with his *On Art and Connoisseurship*, Max Friedlander is known for a comprehensive 14-volume study titled for this time period. For 10 points each:

[10] Name this time period that also titles a 1953 book by Erwin Panofsky in which he applies his iconographic method to a certain region's artistic style.

ANSWER: **Early Netherlandish** painting [or **Early Netherlandish** art/style; accept **Early Netherlandish** Painting or *Die **alt**niederländische Malerei*; accept **Old Netherlandish**, which is the literal translation of the German term; prompt on **Northern Renaissance**; do not accept or prompt on "Dutch Painting" or "Dutch Golden Age"]

[10] In *Early Netherlandish Painting*, Panofsky put forth the claim that this painting could be read as a contract. The two figures in this painting by Jan van Eyck clasp hands to the left of a wooden image of St. Margaret on a bedpost.

ANSWER: *The **Arnolfini Portrait*** [or *The **Arnolfini Wedding***]

[10] The cover of one edition of Panofsky's book features this other van Eyck painting, whose namesake Burgundian commissioner is depicted in a donor portrait on the left and sits opposite the Virgin, who wears a long red cape.

ANSWER: ***Madonna** of Chancellor **Rolin*** [accept any answer referring to Chancellor **Rolin** and a **Madonna**]

<Painting/Sculpture, AK>

10. White mobs rioted after a black girl kissed this object in Arlington during its nationwide tour, which was opposed by Boise Penrose out of animosity for Rudolph Blankenburg. For 10 points each:

[10] Name this object that embarked on a 1915 tour to promote World War I after aggressive lobbying by Blankenburg and "Sunny Jim" Rolph.

ANSWER: **Liberty Bell**

[10] Before the tour seemed viable, the Bell was struck on a phone call with a city in this state; a plot to blow up the Bell in that city in this state failed when the would-be bomber threw the bomb into this state's San Francisco Bay.

ANSWER: **California** [prompt on **CA**]

[10] The Liberty Bell was next rung in 1917 to spur the sales of the "liberty" examples of these things, a plan devised by George Creel and William McAdoo. Norman Rockwell's *The Four Freedoms* went on a nationwide tour to promote the sale of a later version of these things.

ANSWER: war **bonds** [accept Liberty **Bonds** or Series E **Bonds** or Series F **Bonds** or Series G **Bonds**]

<US History, EL>

11. A poetic cycle titled for this man opens with him imploring his country to “waken!... if any foe rejects us, / We’ll broil their liver for our breakfast / and fry their balls like bacon!” For 10 points each:

[10] Name this man who titles a W. D. Snodgrass poetry collection written from the viewpoints of people in his government. Professors in William Gass’s *The Tunnel* and Don DeLillo’s *White Noise* study this man.

ANSWER: Adolf **Hitler**

[10] This poet wrote the lines “What mad Nijinsky wrote / About Diaghilev / Is true of the normal heart” in the poem “September 1, 1939,” which is titled for the day when Hitler’s Germany invaded Poland.

ANSWER: W. H. **Auden** [or Wystan Hugh **Auden**]

[10] The speaker rambles “—Many times Diaghilev wanted me / to make love to him / as if he were / a woman—” in this poet’s “The War of Vaslav Nijinsky.” This neo-Confessional poet won the 2018 Pulitzer Prize for Poetry and has written in personas such as the anorexic “Ellen West” and the real-life serial killer “Herbert White.”

ANSWER: Frank **Bidart**

<Non-Epic Poetry, JC>

12. When constraints in these problems cannot be satisfied simultaneously, the problem is said to be infeasible. For 10 points each:

[10] Identify these problems in mathematics and computer science that find the best value or set of values for a decision variable based on the objective function and the set of constraints that it is subject to.

ANSWER: **optimization** problems [or **optimizing** or word forms; or **maximization** or **minimization** problems]

[10] This class of convex optimization models named for a shape constrains the norm of an affine transformation of the decision variable to be less than or equal to the dot product of the design variable and constraint vector, plus a constraint constant.

ANSWER: **second-order cone** programming [or **SOCP**; or **SOC**; or **conic quadratic** optimization; prompt on **conic** optimization or **convex cone** optimization or **convex** optimization]

[10] A more general class of convex optimization models, including second-order cone programming, are named for this property. A matrix M has this property if, for any nonzero vector x , x -transpose times M times x is non-negative.

ANSWER: **positive semidefinite** [or **PSD**; prompt on **semidefinite** or **semidefinite** programming or **SDP**; do not accept or prompt on “positive definite”]

<Other Science: Math, AK>

13. Journalist Dainis Īvāns (“dye-niss EE-vons”) rose to popularity, and eventually became the first leader of Tautas Fronte, after successfully opposing a proposed structure of this type. For 10 points each:

[10] Name these structures. The illicit trade of caviar in Russia increased when sturgeon populations decreased after the building of one of these structures on the Volga River.

ANSWER: **dams**

[10] The damming of the Danube led to an aborted attempt to recreate much of Ada Kaleh on Simian Island, which failed when Ada Kaleh’s population left and resettled in this region by the Black Sea. The 1940 Treaty of Craiova resulted in the exchange of parts of this region, which roughly corresponds to ancient Scythia Minor.

ANSWER: **Dobruja** [or **Dobrogea**]

[10] Dainis Īvāns led Tautas Fronte in this country, in which it fought for independence. The dictator Kārlis Ulmanis briefly led this country, whose capital names the 1921 treaty that ended the Polish–Soviet War.

ANSWER: **Latvia** [or Republic of **Latvia**] (The treaty is the Treaty of Riga.)

<Continental post-600 History, EL>

14. This god landed three blows on Skrymir, a giant who turned out to be the giant Utgard-Loki in disguise, and was later tricked into fighting a wildfire by the same giant. For 10 points each:

[10] Name this Norse god and frequent enemy of giants who rides in a chariot pulled by goats.

ANSWER: **Thor**

[10] These two servants of Thor accompany him on many of his journeys, including his journey to the castle of Utgard-Loki. According to the *Prose Edda*, they became Thor's servants after eating the marrow of one of his goats. Name either of them.

ANSWER: Thjálfi OR Röskva

[10] Thor disapproved when this dwarf was promised Thor's daughter Thrud in marriage, so he devised a trick in which he distracted this dwarf all night with questions about his knowledge. This dwarf was clearly a quizbowler, because he got so engaged in answering, he forgot that the Sun was rising and consequently turned to stone.

ANSWER: Alviss

<Mythology, WA>

15. Sickle cell anemia provides genetic resistance to this protozoan-caused disease. For 10 points each:

[10] Name this disease caused by members of the *Plasmodium* genus and spread by the *Anopheles* mosquito. It was historically treated with quinine.

ANSWER: malaria

[10] Individuals that are negative for this red blood cell glycoprotein, which was discovered in 1950 and named for the patient it was discovered in, have some resistance to malaria. This glycoprotein is believed to act as a receptor for *P. knowlesi* ("NOLL-zee") and *P. vivax*.

ANSWER: Duffy antigen [or Duffy glycoprotein; accept Fy antigen or Fy glycoprotein]

[10] Deficiency of a kinase ("KYE-naze") that produces this compound and ATP from PEP and ADP also confers resistance to malaria.

ANSWER: pyruvate [or pyruvic acid; or pyruvate kinase]

<Biology, JL>

16. This rebellion began when John Flowerdew convinced the rebels to target its namesake yeoman farmer. For 10 points each:

[10] Name this rebellion that mainly targeted landlords who had been practicing enclosure. Its leaders briefly captured Norwich before being defeated by the Earl of Warwick.

ANSWER: Kett's Rebellion

[10] Kett's Rebellion occurred during the reign of this English monarch, who also faced the Western Rebellion and won the War of the Rough Wooing.

ANSWER: Edward VI [prompt on Edward]

[10] The War of the Rough Wooing concerned Edward's betrothal to this woman, whose son James later became the first Stuart king of England. Elizabeth I ordered this woman's execution in 1587.

ANSWER: Mary, Queen of Scots

<British/CW History, NB>

17. This geographical feature is surrounded by plains where "loneliness is an aspect of the land" according to a memoir that says "your imagination comes to life, and this, you think, is where Creation was begun." For 10 points each:

[10] Name this geographical feature that names an N. Scott Momaday memoir in which the author visits his grandmother's grave.

ANSWER: Rainy Mountain [accept *The Way to* Rainy Mountain]

[10] Rainy Mountain is in this state, which is home to the Kiowa ("KYE-oh-wuh") people described in Momaday's book. The Joad family leaves this state for California in John Steinbeck's *The Grapes of Wrath*.

ANSWER: Oklahoma

[10] In *The Way to Rainy Mountain*, Momaday says that these things "belong in the distance; it is their domain." Momaday won the Pulitzer Prize for Fiction for a novel titled for one of these things "Made of Dawn."

ANSWER: houses [accept House Made of Dawn]

<Long Fiction, EL>

18. This film features a scene in which a crying couple sits in an outdoor cafe littered with yellow tables and chairs as the staff stare at them in an alienating manner from several feet away. For 10 points each:

[10] Name this film that references the melodramas of Douglas Sirk with a scene in which a man kicks a television during a family gathering in an elderly woman's apartment.

ANSWER: *Ali*: **Fear Eats the Soul** [or **Angst essen Seele auf**; prompt on *Ali*]

[10] *Ali: Fear Eats the Soul* was directed by this man, who also starred in the film as Emmi's bitter son-in-law Eugen ("OY-gun"). He directed a TV adaptation of Alfred Döblin's novel *Berlin Alexanderplatz* that lasts over 13 hours.

ANSWER: Rainer Werner **Fassbinder**

[10] Another member of New German Cinema was this director, who chronicled the descent into madness of a Spanish expedition led by his frequent collaborator Klaus Kinski in *Aguirre: the Wrath of God*. He directed the documentary *Grizzly Man*.

ANSWER: Werner **Herzog**

<Other Art: Film, AK>

19. Metrics such as the Schwarzschild ("SHWARTZ-shilled") metric are set in a spacetime that has a symmetry described by the adjectival form of this shape, which has the useful property of being invariant under rotation. For 10 points each:

[10] Give this common shape. Most stars do not precisely take this shape, but rather take a slightly bulging "oblate" shape similar to this one.

ANSWER: **sphere** [or **spherical** spacetime or **spherically symmetric** spacetime or oblate **spheroid**]

[10] The Schwarzschild metric appears in a spherically symmetric solution to this set of equations that relate a set of symmetric 4-by-4 tensors, including the Ricci curvature tensor and the stress-energy tensor.

ANSWER: **Einstein** field equations [or **EFE**; or **Einstein**'s equations; prompt on **field** equations]

[10] This equation is obtained by solving the Einstein field equations for an isotropic fluid in hydrostatic equilibrium in spherically symmetric spacetime. The Lane–Emden equation is yielded by the Newtonian limit of this equation, which implies that there is a single radius that maximizes the stable mass of an incompressible star.

ANSWER: Tolman–**Oppenheimer–Volkoff** equation [or **TOV** equation; or **OV** equation; accept **TOV** limit]

<Physics, WA>

20. Two characters in a play interrupt a discussion about this problem to define carnal embrace, defining it at various points as "the practice of throwing one's arms around a side of beef" and a "sexual congress." For 10 points each:

[10] Name this problem that is discussed in a play in which a tutor hopes that it will occupy his pupil long enough for him to read *The Couch of Eros*.

ANSWER: the proof of **Fermat's Last Theorem**

[10] Septimus Hodge and Thomasina Coverly discuss Fermat's Last Theorem at the beginning of this Tom Stoppard play, in which Hannah Jarvis searches for the Sidney Hermit.

ANSWER: **Arcadia**

[10] Thomasina claims that "everything is turned to love" with this woman who "carnal embraced the enemy." Septimus quote-unquote "translates" the lines "the barge she sat in... the poop was beaten gold" about this woman, who rolls herself up in a carpet to meet with her rival and lover.

ANSWER: **Cleopatra**

<Drama, EL>

