

2020 ACF Winter

Packet J by Harvard B, Illinois A, Minnesota A, Rice A, Rutgers A, Warwick A

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Tossups

1. In a six-page sequel to this novel, the roof falls in on the now-elderly protagonist after he rescues horses and cows from a barn fire. The mother of this novel's protagonist peels potatoes while telling him, "Don't you be a fool" and packing him a cup of blackberry jam. This novel notes, "The red sun was pasted in the sky like a wafer" after a tall man's delirious death. A "jovial squirrel" runs from a pinecone thrown by this novel's protagonist, who is usually called "the youth." The "tattered man" comforts this novel's protagonist after he watches the death of Jim Conklin. This novel's protagonist deserts the 304th New York Infantry Regiment. For 10 points, Henry Fleming serves in the Union Army in what novel by Stephen Crane?

ANSWER: *The **Red Badge of Courage*** [or *The **Red Badge of Courage: An Episode of the American Civil War***; accept *Private Fleming, His **Various Battles***] (The first sentence is about "The Veteran.")

<American Literature>

2. All 120 of this country's tribes trade in its "River of Mosquitos" market. Residents of this country's capital can ride crowded dala dala buses through the streets where "Bongo Flava" hip hop originated. This country has the world's largest population of albino people, centered in its cities of Shinyanga and Mwanza. An island owned by this country is where the House of Wonders was built in Stone Town and where Freddie Mercury was born. This country's Gombe Stream National Park is home to chimpanzees studied by Jane Goodall. The Ngorongoro Crater in this country was the site of archaeological digs at the Olduvai Gorge. Mount Meru and Mount Kilimanjaro are located in, for 10 points, what East African country whose cities include Dodoma and Dar es Salaam?

ANSWER: **Tanzania** [or the United Republic of **Tanzania**]

<CE/Geo/Other/Pop Culture>

3. This was the [emphasize] *last* decade in which "shuttle traders" used large checkered suitcases to smuggle foreign goods such as colorfully-branded plastic bags. Stanislav Shatalin attempted to reform his country's economy in this decade through the "500 Days" program. The hedge fund LTCM collapsed during this decade due to a large stake in fragile foreign bonds. A "loans-for-shares" voucher system implemented by Anatoly Chubais ("choo-BYES") during this decade led to most of the country's resources being controlled by a group of "oligarchs." "Shock therapy" under Boris Yeltsin failed to spark economic recovery in this decade, leading to the rise of a young Vladimir Putin. For 10 points, in what decade did the ruble collapse following the fall of the Soviet Union?

ANSWER: **1990s** [or **'90s**]

<European History>

4. After the "life of growth" and "life of perception" are ruled out as possible functions of man, this concept is discussed as the noble performance of a rational principle. A book titled for this concept claims that the "state of grave disorder" of its author's field is due to a focus on emotivism instead of teleology. One thinker implicitly contrasted craft expertise with four "intellectual" examples of this concept. The "aretic turn" refers to the recent popularity of this concept, which is discussed in an Alasdair MacIntyre book titled *After* [this concept]. Attaining this concept requires achieving a "golden mean" between excess and deficiency, according to Aristotle's *Nicomachean Ethics*. Deontology and utilitarianism are often contrasted with, for 10 points, an ethical approach named for what type of positive character trait?

ANSWER: **virtues** [accept **virtue** ethics or variety of **excellence**; accept **arete** until "aretic" is read]

<Philosophy>

5. An actor lowers their value of this quantity in order to lower it in another individual in a behavior that has a Wilsonian form. The ways that this quantity tends to increase and decrease inspired shifting balance theory. A relative increase and decrease of this quantity are denoted by b and c in the equation " rb minus c is greater than 0." By solving for this variable in the Price equation, one can derive the statement that the rate of increase in this quantity equals the variance in this quantity, known as Fisher's fundamental theorem. Hamilton's rule explains when it is beneficial to lower one's own value of this quantity in order to benefit a related organism's value of it, which is a behavior known as altruism. For 10 points, name this measure that is higher for organisms favored by natural selection.

ANSWER: **fitness** [or adaptive **fitness** landscapes] (The first clue refers to spite.)
<Biology>

6. A sequel to one of this author's novels by Sally Beauman follows Ellie and her father Colonel Julyan, who regrets a verdict he made despite holes being found in the bottom of the boat *Je Reviens* ("zhuh ruv-YANN"). One of this author's characters chases after the dog Jasper, who leads her to the mentally handicapped gardener Ben. A novel by this author begins with the protagonist accompanying Mrs. Van Hopper to Monte Carlo. In that novel by this author, the title character's body is found in a sunken ship after the protagonist angers Maxim by wearing a dress suggested by Mrs. Danvers. This author's most famous novel begins "Last night I dreamt I went to Manderley again." For 10 points, what author wrote about the second Mrs. De Winter in *Rebecca*?

ANSWER: Daphne **du Maurier**
<British Literature>

7. A painting titled for one of these events was created from the right half of the artist's abandoned painting *The Harlequins* and depicts a chandelier at the top. In the foreground of a painting of one of these events, a boy in a red hat with a peacock feather is shown licking a plate. In that painting of one of these events, two people use a door to carry food across the foreground. Erwin Panofsky argued that an artist's signature on the back wall in a painting of one of these events functioned as a legal record. A painting believed to depict one of these events features a convex mirror that is surrounded by scenes from the Passion of the Christ. For 10 points, a dog and a pair of clogs appear at the bottom of a Jan van Eyck painting depicting what type of event between the Arnolfinis?

ANSWER: **weddings** [or **marriages**; or similar; accept *The Arnolfini **Wedding*** or *The Arnolfini **Marriage***; accept *The Peasant **Wedding***; accept *The **Wedding** Candles*; accept **betrothal**; prompt on *The Arnolfini **Portrait*** by asking "what is the other common title of that painting?"]
<Painting/Sculpture>

8. A Thanksgiving protest at this country's embassy was led by "forum" leaders Mary F. Berry and Randall Robinson. In the 1970s, the US became this country's largest trade partner due to its vanadium and platinum deposits mined in the "mineral revolution." The Polaroid Revolutionary Workers opposed this country, where conditions at a large GM subsidiary motivated the Sullivan principles. Chester Crocker masterminded "constructive engagement" with this country, which was sanctioned when Ron Dellums's 1986 bill overrode a veto. The song "Sun City" protested this country, where Paul Simon broke a cultural boycott to record *Graceland* in its townships. The anti-Israel BDS movement imitates boycotts of this country endorsed by Desmond Tutu. For 10 points, Ronald Reagan supported what country's apartheid regime?

ANSWER: **South Africa** [or Republic of **South Africa**; or **RSA**; prompt on [TransAfrica Forum](#)]
<American History>

9. A “dynamic” approach extends an asymmetric method named for this adjective that reacts only one of a racemic (“ruh-SEE-mick”) mixture’s enantiomers, as an alternative to converting both into diastereomers. This adjective describes the product created by the 1,2 addition of hydrochloric acid to butadiene (“byoo-ta-DYE-een”), which forms preferentially at lower temperatures but is not as stable as the thermodynamic product. Substituting atoms with a heavier analog slows a reaction in an “isotope effect” named for this word, which also names the branch of physical chemistry that studies reaction rates. This adjective names a “molecular theory” that models gas particles undergoing elastic collisions, which conserve this form of energy. For 10 points, what type of energy is proportional to the square of a molecule’s velocity?

ANSWER: **kinetic** [or **kinetics**; accept **kinetic** energy; accept **kinetic** molecular theory; accept **kinetic** resolution; accept **kinetic** product; accept **kinetic** control; accept **kinetic** isotope effect; prompt on **enzymatic** resolution or **chemical** resolution or **chiral** resolution by asking “what is the typical term for that approach to chiral resolution?”]
<Chemistry>

10. A deity who controls these places is a son of Rangi (“RONG-ee”) who never leaves Papa’s womb, named Rūaumoko. A deity who lives in one of these places is honored by *Hōlua* sledding. A goddess who lives in one of these places is saved from a rape attempt after her sister throws her detachable vagina to distract a hog-man. A goddess of these places turns Hopoe (“ho-PO-eh”) to stone and destroys a sacred grove after her sister doesn’t return with her lover within 40 days; that sister, who hatched out of an egg she held under her armpit, was Hi’iaka. A goddess of one of these places is the rivals of the snow goddess Poli’ahu. Zeus traps Typhon under one of these places whose activity is explained by the presence of Hephaestus’s forges. For 10 points, what type of place is Pele’s home of Kilauea?

ANSWER: **volcanoes** [accept **craters** or **calderas**; accept subtypes of volcanoes like **stratovolcanoes**; prompt on **mountains** or on **Mt. Etna**; prompt on **Hawai’i** or **islands** by asking “what location on an island?”]
<Mythology>

11. The speaker of a poem by this author pleads “Please use your cane” and describes the subject as a “near-sighted philosopher” and “One drop of crocodile.” This author of “The Old Lizard” recounts a “Market crash in a pyramid of moss” in a poem written during his time in university. In a section of a poem called “The Absent Soul,” this poet recalls “a sad breeze through the olive trees.” This poet described “the blood of Ignacio” after an event that occurred “At five in the afternoon.” Adela betrays the title matriarch of a play by this author to pursue a relationship with Pepe. In a play by this author, the Bride wears a blood-stained gown after Leonardo and the Groom kill each other. For 10 points, name this author of “Lament for the Death of a Bullfighter,” *The House of Bernarda Alba*, and *Blood Wedding*.

ANSWER: Federico García **Lorca**
<European Literature>

12. A group of ducks passes in front of motorcycles in a 1954 photo collection of this country’s roads. Photographers best known for their work in this country include Larry Burrows and Horst Faas. Sal Veder photographed a person’s return to America from this country in *Burst of Glory*. Robert Capa died in this country, which is where Art Greenspon photographed a man in this country falling with his hands in the air. The documentary *Hearts and Minds* includes a photo from this country in which a naked, crying girl flees from a burning village. John F. Kennedy remarked “Jesus Christ!” upon seeing a Malcolm Browne photograph from this country of a burning monk. For 10 points, name this country where Eddie Adams photographed the moment when a man was shot during the Tet Offensive.

ANSWER: **Vietnam** [or Socialist Republic of **Vietnam**; accept North **Vietnam** or South **Vietnam**; accept the Republic of **Vietnam**; accept the Democratic Republic of **Vietnam**; prompt on **DRV**; accept the **Vietnam** War]
<Other Arts>

13. The “Khentkaus Problem” concerns whether the resident of LG100 held this position herself, rather than being the mother of two holders of this position. Claims that a holder of this position was cross-dressing have been debunked by her use of the title “she who is first among noblewomen.” Herbert Winlock’s discovery of destroyed relics serves as evidence that a holder of this position buried at Deir el-Bahri was a victim of historical erasure. That holder of this position sent a trading expedition to the land of Punt. The last independent holder of this position ruled alongside her infant son Caesarion. Another holder of this position took over from her husband Akhenaten. For 10 points, name this position held by Hatshepsut, Nefertiti, and other rulers of ancient Egypt.

ANSWER: **Pharaoh** [or **Queen** of **Egypt**; technically accept **Hatshepsut**, since that was actually her title; accept **King** of **Egypt**, although the mentioned leaders were all female; accept partial answers indicating only a monarch after “Egypt,” but prompt before]

<Other History>

14. This physicist developed a generalization of the Poisson bracket used when analyzing systems with second class constraints. This physicist sometimes names the interaction picture of quantum mechanics. The Pauli matrices and the 2-by-2 identity matrix can be used to write a set of 4-by-4 anticommuting matrices pioneered by this physicist, which are used to generate a Clifford algebra. Those gamma matrices may be used to simplify this physicist’s namesake equation. This physicist posited that the existence of a magnetic monopole would be a sufficient condition for the quantization of charge. Negative energy solutions to this physicist’s namesake equation implied the existence of antimatter. For 10 points, what British physicist names a relativistic generalization of the Schrödinger equation?

ANSWER: Paul **Dirac** [or Paul Adrien Maurice **Dirac**]

<Physics>

15. This process is analyzed by drawing screen lines within cordon lines. Matthew Turner’s “fundamental law” and Downs’s law describe impediments to this process, whose “principle” creates settlement patterns of k -equals-4 in Christaller’s central place theory. Different costs from this process create successive rings of dairy, lumber, cropland, and livestock farms around a city in von Thünen’s model. The first US Secretary of this department, Alan Boyd, supported Lady Bird Johnson’s beautification campaign. Since the 1950s, a bulk form of this process employs standardized “intermodal” devices sold by Mærsk (“mehsk”) and handled by stevedores (“STEE-vuh-dors”). Urban agglomeration reduces the need for this process, which is plagued by the “last mile problem.” For 10 points, what process links supply chains by conveying freight and cargo?

ANSWER: **transportation** [accept **freight** or **cargo** until read; accept **transit** or **commuting** or similar; accept **traffic** or road **congestion**; accept **container** ships or **shipping** containers; accept **supply chain** management until read; prompt on international **trade**; prompt on **networks** or **roads** or **highways** or **driving** or similar; prompt on **globalization**; accept Secretary of **Transportation**; prompt on **travel**]

<Social Science>

16. This character is the protagonist of a play whose chorus imagines that “The waters in the sacred rivers / are flowing in reverse” in response to this character’s promise to not dishonor her grandfather’s lineage. This character is compared to a sea-monster and a lioness by a man whom this character claims will suffer an “unheroic death” from being hit in the head by wreckage from a ship. This character promises to cure King Aegeus’s infertility in exchange for granting her sanctuary in Athens after she is exiled by Creon. This character uses a chariot of Helios to escape Corinth after gifting a poisoned robe to her lover’s new bride Glauce (“glossy”) and killing her children in revenge. For 10 points, name this title character of a Euripides play, the wife of Jason.

ANSWER: **Medea**

<World/Other Literature>

17. Women during this dynasty were referred to as “thieves” because of their high dowries and could be divorced by one of “seven sins.” The “Short Hair Act” infuriated scholars as part of this dynasty’s Gabo reforms. The “scholar’s calamity” occurred during this dynasty when the Sarim faction occupied the Three Offices. A plot by this dynasty’s Six Martyred Ministers led to the dissolution of an institution that had earlier promoted the writing of syllables shaped similarly to mouth structure. The Hall of Worthies were scholars who served an emperor of this dynasty who created the *hangul* script. Admiral Yi’s turtle ships defended this dynasty, which was led by Sejong the Great. For 10 points, a 1910 Japanese annexation marked the end of what final independent dynasty of Korea?

ANSWER: **Joseon** Dynasty [or **Chosun** Dynasty; or Great **Chosun** Country]

<World History>

18. This function can be easily evaluated on an arbitrary function with the law of the unconscious statistician, or LOTUS. This function is the upper bound of the product of any number and the probability that a random variable is greater than that number, according to Markov’s inequality. This function of “*e* to the power of *t* times *X*” is the moment generating function, which is why its value is the first moment of a distribution. This function of a distribution acts as the asymptote in the law of large numbers. Subtracting the square of this quantity for a random variable *x* from this quantity for *x*-squared yields the variance. This value equals the integral of *x* times *f*-of-*x* *dx*, where *f*-of-*x* is the PDF of a distribution. For 10 points, name this statistical quantity, the weighted average of a random variable’s outcomes.

ANSWER: **expected value** [or **expectation** value; accept **first moment** until read; accept **mean**; accept weighted **average** until read; prompt on **E** or **E of x**, but do not accept or prompt on “*e* to the *x*”]

<Other Science>

19. A piece of this type begins with divisi cellos playing the *largo* theme [read slowly] E-flat E-flat F, [pause] G followed by a similar figure ending in three A-flats. A turbulent piece of this type begins with a *fortissimo* D minor imperfect cadence and quotes from its composer’s second symphony in D major. Arthur Fiedler (“FEED-ler”) and the Boston Pops popularized the playing of a piece of this type during US Independence Day celebrations. The commencement song “Gaudemus igitur” is quoted in a piece of this type that Johannes Brahms wrote at the same time as his *Tragic* one. *La Marseillaise* (“mar-say-EZ”) is quoted in a piece of this type that includes a volley of cannon fire. For 10 points, name this type of orchestral piece exemplified by Brahms’s *Academic Festival* and Tchaikovsky’s *The Year 1812*.

ANSWER: **overture** [accept concert **overture**; do not accept or prompt on “opera overture”]

<Classical Music>

20. People pray while releasing these animals from clay containers on the Burmese New Year Thingyan. Jafar Panahi’s film *The White Balloon* dramatizes Iran’s ritual of buying these animals for the haft-sin on Nowruz. These animals are cut out of paper for the French April Fools. Italian-Americans “feast” on seven of these animals on Christmas Eve. Although capybaras are rodents, they are treated as these animals in Venezuela for Holy Week. Like eggs, these animals are pareve (“PAR-iv”). A Sanskrit “law” of these animals, meaning survival of the fittest, comes from Manu saving Vishnu’s avatar in this form, Matsya. Jesus multiplies loaves and these animals, which Early Christians used as a symbol of Jesus that now graces many bumper stickers. For 10 points, what animals do Catholics eat on Fridays for Lent?

ANSWER: **fish** [accept **Ichthys** or the “Jesus **fish**”; accept specific kinds of fish such as **goldfish**; do not accept or prompt on “whales” or similar; accept **poissons** d’avril; accept Feast of the Seven **Fishes** or Festa dei sette **pesce**]

<Religion>

21. Polly Arnold's lab made a dication ("dye-cat-ion") of one of these elements whose simple nitride is a synthetic target for generation IV devices. These elements are recycled in "advanced reprocessing." An alkali metal was discovered by Marguerite Perey while she tried to purify the lightest of these elements in the Curie lab. These pyrophoric elements form the outer half of a "peninsula" on Theodor Benfey's extended periodic table next to predicted "super" elements. Four of these elements begin the natural decay series. Superheavy elements called the "trans-*[these elements]*" undergo spontaneous fission. Glenn Seaborg's "concept" holds that these unstable, radioactive elements constitute a 5f transition series, based on examples like berkelium and americium. For 10 points, what f-block elements appear on the periodic table below the lanthanides?

ANSWER: **actinides** [accept **actinoids**; accept **actinium** or **Ac**; prompt on **f-block** elements until read; prompt on **group 3** elements or **period 7** elements by asking "what other set does that element belong to?"; prompt on **transuranic** or **transuranium** elements; accept super**actinides** or trans**actinides**; prompt on **U** or **uranium** or **uranyl** dication or **thorium** or **Th** or **neptunium** or **Np** or **nuclear** or **radioactive** elements by asking "what set of elements on the periodic table does it belong to?"; do not accept or prompt on "rare-earth elements"]

<Chemistry>

Bonuses

1. This institution's legal scholar Ahmad Baba as-Sudane denounced the association of Africans with slaves and argued against the slavery of Muslims in the treatise *Mi'raj al-Su'ud*. For 10 points each:

[10] Name this institution constructed by the Granadan architect al-Sahili, which was home to the Fula scholar Modibo Mohammed Al Kaburi.

ANSWER: **Sankore** University [or **Sankore** Madrasah; or **Sankore** Masjid; or **Sankore** Mosque; prompt on **University of Timbuktu**]

[10] Ahmad Baba was kidnapped and later worked at a university founded by Fatima al-Fihri and funded by the Idrisid dynasty in this country. This country's commander Judar Pasha used gunfire to spook cattle and cause a stampede over Songhai soldiers during the 1591 Battle of Tondibi.

ANSWER: **Morocco** [or Kingdom of **Morocco**]

[10] Moroccan pashaliks installed in West Africa eclipsed the political power of this earlier empire's *mansas*. This empire's Mansa Musa I commissioned Sankore and extravagantly spent in Egypt during an expensive hajj.

ANSWER: **Mali** Empire [or **Manden** Kurufaba; or **Nyeni**]

<World History>

2. An 18th-century group known as the "Trinity" of this style of music was known for introducing original melodic structures. For 10 points each:

[10] Name this style of music, common in the south of its country, where songs called *kritis* typically feature a vocalist being accompanied by a violin, *tambura*, and other instruments.

ANSWER: **Carnatic** music [accept **Karnāṭaka** saṃgīta or **Karnāṭaka** saṅgītam; prompt on **Indian** classical music; do not accept or prompt on "Hindustani classical music" or similar]

[10] In Carnatic music, *talas* represent this feature of the music. This feature of a musical work is determined by the timing and duration of notes and is often emphasized by percussion instruments.

ANSWER: **rhythm** [accept **meter**; prompt on **beat**]

[10] In Carnatic music, the *tambura* usually serves this unchanging harmonic role in accompanying the singer. This harmonic role is also fulfilled by the pedal point on an organ or the fifth string of a five-string banjo.

ANSWER: **drone** [accept **bourdon**, **burden**, or **burdon**]

<Classical Music>

3. This poet's "individualism" led to his ban from the Literary Institute. For 10 points each:

[10] Name this poet who wrote "in the hours of trouble do come here" in "Zima Junction," a poem about a visit to his hometown. This poet described "A drop sheer as a crude gravestone" in a protest poem.

ANSWER: Yevgeny **Yevtushenko**

[10] Yevtushenko was a poet from this country. Boris Pasternak was forced to decline a Nobel Prize for *Doctor Zhivago* by the government of this country.

ANSWER: **Soviet Union** [or **USSR** or **Union of Soviet Socialist Republics**; prompt on **Ukraine** or **Russia**]

[10] Another Ukraine-born author who protested Soviet censorship was this writer, who dedicated *Poem without a Hero* to those that died at Leningrad. This poet protested the imprisonment of her son Lev in *Requiem*.

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

<European Literature>

4. Buddhists in this country perform the Cham dance before unveiling giant appliqué thangka (“tahng-kah”) paintings called thongdrel (“tong-drel”) during Tsechu (“tsay-choo”) festivals. For 10 points each:

[10] Name this country whose Wangchuck royal family received Danish funds to build a museum for Vajrayana textiles like tshemdru (“tsem-droo”). This country’s Tiger’s Nest monastery and dzong fortresses house statues of the Drukpa monk Ngawang Namgyal (“nah-wang nahm-shyahl”).

ANSWER: **Bhutan** [or Kingdom of **Bhutan**; or **Druk Gyal** Khap or **Druk Yul**; accept **Bhutan** Textile Museum]

[10] Bhutan’s Paro Tsechu features the Dance of the Eight Manifestations of Guru Rinpoche (“reen-POH-chay”), who is born from this object in wall paintings. The central chant of Soka Gakkai evokes a text named for this object.

ANSWER: **lotuses** [prompt on flowers or blossoms or blooms or aquatic plants; accept **Lotus** Sūtra or Saddharma **Puṇḍarīka** Sūtra; accept **padma** or **Padmasambhava**]

[10] The Lotus Sūtra opens with the Buddha on Vulture Peak giving one of these discourses that he first delivered at the Deer Park. In Protestant Christianity, preachers deliver these orations that resemble Catholic homilies.

ANSWER: **sermons** of the Buddha [accept the First **Sermon** of the Buddha]

<Religion>

5. In this book, the author concludes that the sentence “Moses did not exist” only means something when it is used to say something. For 10 points each:

[10] Name this book that includes a passage imagining someone who writes the letter “S” in a diary each time they experience a particular sensation as an example of an action without a standard of correctness.

ANSWER: ***Philosophical Investigations*** [or ***Philosophische Untersuchungen***]

[10] This Austrian philosopher discussed the impossibility of private languages in *Philosophical Investigations*, which attacked many of the positions he had earlier taken up in the *Tractatus Logico-Philosophicus*.

ANSWER: Ludwig **Wittgenstein**

[10] *Philosophical Investigations* opens with an analysis of an episode about language acquisition from an autobiography by this much earlier philosopher, which also discusses his conversion from Manichaeism to Christianity.

ANSWER: Saint **Augustine** of Hippo

<Philosophy>

6. A protein named for this condition has an ODD domain that is tagged by PHD-2 for degradation unless this condition is met. For 10 points each:

[10] Name this condition that triggers sprouting angiogenesis, as it allows a namesake transcription factor to upregulate production of VEGF (“vej-F”).

ANSWER: **hypoxia** [or **hypoxia**-inducible factor; accept **anoxia**; accept descriptions like **low oxygen** levels; prompt on **HIF-1**]

[10] Hypoxia-inducible factor is abused by these things to cause sustained angiogenesis and meet their high energy requirements. The term metastasis (“muh-TASS-tuh-siss”) is most commonly used to refer to the spread of cells from these things.

ANSWER: **tumors** [or malignant **neoplasms**; prompt on cancer cells or specific types of cancer]

[10] Even in conditions with normal oxygen, cancer cells tend to favor the aerobic form of this process; that preference is known as the Warburg effect. ATP inhibits PFK, an enzyme that takes part in this process.

ANSWER: aerobic **glycolysis**

<Biology>

7. This country's rowdy defense minister Sam Hughes was criticized for equipping soldiers with the often faulty Ross rifle. For 10 points each:

[10] Name this country that faced major conscription crises during both World Wars. Units from this country captured Passchendaele ("PAH-sun-DALL-uh") Ridge at great cost during the Third Battle of Ypres ("EEP-ruh").

ANSWER: **Canada**

[10] Canadian infantry troops under Julian Byng stormed Hill 145 at this World War I battle, losing thousands of men but earning respect from the British as a fighting force.

ANSWER: Battle of **Vimy Ridge** [prompt on the Battle of **Arras**]

[10] Canadians during World War II carried out a successful raid on the port of Dieppe on the French coast. The Dieppe raid served as a precursor to this larger beach assault in 1944.

ANSWER: **D-Day** invasion [accept Operation **Overlord**; accept Battle of **Normandy**]

<Other History>

8. In several sequences in this novel, scientists, rulers, and mythological figures from Earth's history attempt to predict a planet's Stable Eras and Chaotic Eras in a virtual reality video game. For 10 points each:

[10] Name this 2008 sci-fi novel that culminates with the discovery of an alien civilization on the planet Trisolaris, and their impending invasion of Earth.

ANSWER: *The **Three-Body Problem*** [or **Sān tǐ**] (by Liú Cíxīn)

[10] In *The Three-Body Problem*, scientist Yè Wénjié ("yeh wun-j'yeh") makes first contact with the Trisolarans while working at a military base in this country. Her father is killed during this country's Cultural Revolution.

ANSWER: **China** [or People's Republic of **China**; or **PRC**; or **Zhōngguó**]

[10] Ken Liu, who translated *The Three-Body Problem* into English, is best known for "The Paper Menagerie," a short story that ends with the narrator finding a letter from his mother in an origami animal of this type. A white animal of this kind titles an Aravind Adiga novel framed around a letter sent to the Chinese Premier Wēn Jiābǎo.

ANSWER: **tiger** [accept *The White **Tiger***; accept **lǎohǔ**]

<World/Other Literature>

9. Rudy Van Gelder recorded the vast majority of this label's output in the 1950s and '60s. For 10 points each:

[10] Name this jazz record label. Reid Miles designed over 500 of this label's iconic covers, including ones for Lee Morgan's *The Sidewinder* and Eric Dolphy's *Out to Lunch!*.

ANSWER: **Blue Note** Records

[10] Blue Note Records put out three volumes of this musician's compilation series *Genius of Modern Music*. This pianist wrote "Round Midnight" and the album *Brilliant Corners*.

ANSWER: Thelonious **Monk**

[10] Blue Note also released the album *Somethin' Else* by Cannonball Adderley, who played this instrument. John Coltrane has played the alto, tenor, and soprano varieties of this instrument.

ANSWER: **sax**ophone

<Other Arts>

10. This technique is used to synthesize ultra-high-purity silicon ingots. For 10 points each:

[10] Name this technique in which a molten region travels up a feed rod, after which the feed material refreezes into a single crystal.

ANSWER: **zone melting** [accept **zone refining** or **floating-zone** process or **float zone** process or **traveling melting zone** method]

[10] Zone melting can be used to produce bulk cuprates such as YBCO (“ib-ko”) or BSCCO (“biss-co”), which act as this sort of material at surprisingly high temperatures.

ANSWER: **superconductors** [accept high-temperature **superconductors**; do not accept or prompt on “conductors”]

[10] High-temperature superconductors are defined as functioning above this substance’s boiling point of 77 kelvins. This is the most common coolant used in cryogenics due to being easily obtained from air.

ANSWER: **liquid nitrogen** [prompt on **nitrogen** or **N₂**]

<Physics>

11. This country’s Falun Mine provided much of Europe’s copper for almost a thousand years. For 10 points each:

[10] Name this kingdom ruled by Gustavus Adolphus and the house of Vasa.

ANSWER: **Sweden** [or Kingdom of **Sweden**; or Konungariket **Sverige**]

[10] Miners rose up under Engelbrekt Engelbrektsson to oppose the policies of duke Eric of this region. Duke Eric of this region took over his highest position following the regency of his aunt Margaret.

ANSWER: **Pomerania** [or **Pommern**; accept **Pomerania**-Stolp]

[10] The Falun mine was initially outpaced by production at the mines at Rammelsberg. Those mines were first discovered during the reign of this ruler, and were described in the chronicle of his advisor Widukind of Corvey.

ANSWER: **Otto the Great** [or **Otto I**, Holy Roman Emperor; or **Otto der Grosse**; prompt on **Otto**]

<European History>

12. In October 2020, members of the Grey Wolves marched through Lyon’s streets chanting that they would lynch people of this ethnicity. For 10 points each:

[10] Name this ethnicity of the lawmaker Garo Paylan, who was targeted by a series of propaganda attacks from the IYI-funded Center of Eurasian Studies. People of this ethnicity are the majority in the city of Stepanakert.

ANSWER: **Armenians**

[10] Anti-Armenian sentiment in the Muslim world has been stoked over Armenia’s 2020 skirmishes with this other Caucasian country over Nagorno-Karabakh.

ANSWER: **Azerbaijan** [or Republic of **Azerbaijan**; or **Azərbaycan** Respublikası]

[10] Azerbaijani forces have been widely supplied with the Turkish Bayraktar and Israeli Harpy models for these vehicles. In 2019, the United Arab Emirates used the Chinese Wing Loong model of these vehicles with laser-guided Blue Arrow missiles to destroy a Libyan factory.

ANSWER: combat **drones** [or **UAVs** or **Unmanned Aerial Vehicles**; or **UCAVs** or **Unmanned Combat Aerial Vehicles**; prompt on **airplanes** or **aircraft** or equivalents]

<CE/Geo/Other/Pop Culture>

13. The alcoholic poet Beverly Weston's body is found in a lake at the end of Act I of a play that takes place in this month. For 10 points each:

[10] Name this month that partially titles a play about the pill-addicted Violet. In a novel partially titled for this month, it is left ambiguous whether Joe Brown or his business partner murders Joanna Burden.

ANSWER: **August** [accept **August**: *Osage County*; accept *Light in August*]

[10] *Light in August* was written by this Southern author of the novels *As I Lay Dying* and *The Sound and the Fury*.

ANSWER: William **Faulkner**

[10] *Light in August* is titled for a fire, as is another Faulkner short story in which Abner Snopes is put on trial and eventually murdered for burning down two separate buildings of this type.

ANSWER: **barns** [accept "**Barn** Burning"; accept equivalents like **farm** houses]

<American Literature>

14. Ishtar threatens to release the dead and allow them to eat the living if she isn't allowed to send this beast to Earth. For 10 points each:

[10] Name this beast sent by a furious Ishtar to attack Gilgamesh after he spurns her romantic advances. Like Humbaba, this beast is slain by Gilgamesh and Enkidu, though Enkidu becomes ill and dies as punishment for killing it.

ANSWER: the **Bull of Heaven** [prompt on **bull**]

[10] The Canaanite goddess Astarte ("uh-STAR-tee") was an even more warlike equivalent of Ishtar, likely because she absorbed aspects of this extremely metal goddess who loved to wade through the blood of her enemies. After the death god Mot kills Ba'al, this goddess kills him in revenge.

ANSWER: **Anat**

[10] Worship of Ishtar and Astarte influenced the worship of this Greek goddess of beauty and love. Ishtar's journey to the underworld to save Tammuz can be seen as a parallel story to this goddess's love for Adonis.

ANSWER: **Aphrodite** [or **Venus**]

<Mythology>

15. At 50 percent of Bmax on a hyperbolic curve, ligand concentration equals this quantity, which has a femtomolar value for the interaction between avidin and biotin. For 10 points each:

[10] Name this specific type of equilibrium constant, which has different values for each site on a Hill plot if positive or negative cooperativity occurs. The slope equals negative one over this quantity on a Scatchard plot.

ANSWER: **Kd** [or **K-sub-d**; or equilibrium **dissociation** constant; accept **Ki** or **inhibition** constant; prompt on **K**; prompt on **binding** constant; do not accept or prompt on "acid dissociation constant" or "pKa"; accept **affinity** constant]

[10] The Cheng-Prusoff equation can calculate the dissociation constant Kd when one of these molecules binds to an inhibitor. Menten and Michaelis modeled the interaction between these biological catalysts and their substrates.

ANSWER: **enzymes** [accept **enzymology**; prompt on **proteins**]

[10] In his "ten commandments" of enzymology, Kornberg noted that biochemists are free to optimize conditions for their enzymes, including providing substrates at this level. This term means that excess substrate occupies all enzymatic sites and the reaction reaches Vmax.

ANSWER: **saturation** [or word forms like **saturated**]

<Chemistry>

16. In a book subtitled *The Logic of Sensation*, Gilles Deleuze (“zheel duh-LOOZ”) posits the “zone of indiscernibility” as a framework for analyzing works by this artist. For 10 points each:

[10] Name this painter whose graphic, carnal imagery led Deleuze to write that “Meat is the common zone of man and the beast.” Pope Innocent X sits screaming between two halves of a cow in this Irish painter’s *Figure With Meat*.

ANSWER: Francis **Bacon**

[10] Bacon’s painting *Three Studies for Figures at the Base of a Crucifixion* depicts three of these figures screaming against a red background. One of John Sargent’s last completed paintings depicts these figures holding snakes while pursuing a man.

ANSWER: the **Furies** [or **Erinyes**; or the **Eumenides**]

[10] *Three Studies for Figures at the Base of a Crucifixion* is an artwork of this type. Bacon painted three *Black* works of this type after the suicide of his lover George Dyer, and Hieronymous Bosch’s *Haywain* and *The Garden of Earthly Delights* are also examples of these three-paneled paintings.

ANSWER: **trptych** [accept *The Black Triptychs*; accept *The Haywain Triptych*]

<Painting/Sculpture>

17. Ernest Schanzer wrote a 1963 book titled for these types of works in which he proposed a different grouping of these works than the three originally proposed ones. For 10 points each:

[10] Name this term coined by literary critic F. S. Boas that refers to works by a certain author that cannot be easily categorized into a genre.

ANSWER: Shakespearean **problem plays** [accept *The Problem Plays of Shakespeare: A Study of Julius Caesar, Measure for Measure, Antony and Cleopatra*]

[10] Boas defined this Shakespeare play as a problem play because no “partial settlement of difficulties takes place, and we are left to interpret [its] enigma as best we may.” This play ends with Fortinbras’s arrival in Denmark after the title prince and his uncle Claudius are poisoned.

ANSWER: **Hamlet** [or *The Tragedy of Hamlet, Prince of Denmark*]

[10] Despite being commonly identified as problem plays, *Measure for Measure* and *All’s Well that Ends Well* were classified as comedies in this book. This 1632 book contains all but three of Shakespeare’s plays.

ANSWER: **First Folio** [accept *Mr. William Shakespeare’s Comedies, Histories, & Tragedies*]

<British Literature>

18. A sociologist with this surname originated a myth that was effectively disproven by a case study led by France Winddance Twine. For 10 points each:

[10] Give this surname of the sociologist who excused Portugal’s colonial empire as benign “lusotropicalism.” A thinker with this surname applied Fanon and Memmi’s postcolonial theories to education in *Pedagogy of the Oppressed*.

ANSWER: **Freire** [accept Paulo **Freire** or Gilberto **Freyre**]

[10] Gilberto Freyre’s *The Main House and the Slave Quarters* originated the idea that Brazil exhibits a non-racist “racial” form of this system. Citizens’ initiatives facilitate the “direct” type of this system, which is “representative” in countries with a parliament.

ANSWER: **democracy** [accept racial **democracy** or **democracia** racial; accept direct **democracy** or representative **democracy** or parliamentary **democracy**; or word forms like **democratic**; accept *Racism in a Racial Democracy: The Maintenance of White Supremacy in Brazil* (the Twine study)]

[10] The book *The Denial of Antiracism* critiques “racial democracy” by comparing this profession in the US and Brazil. Operation Car Wash was initiated by people from this profession, who ride water buffalos on Marajó (“ma-ra-ZHO”).

ANSWER: **police** [or police **officers**; or **cops**; or **polícia**; or equivalents; accept Federal **Police** of Brazil or **Polícia** Federal; accept police **investigator**s or other specific types of police]

<Social Science>

19. Recent research suggests that this process is slowing down dramatically and that 95 percent of the instances of it have already happened, a phenomenon known as galactic quenching. For 10 points each:

[10] Name this process that doesn't occur in quiescent galaxies. H II ("H two") regions are notable for having a high rate of this process.

ANSWER: **star formation** [or **stellar birth** or **star creation** or equivalent answers about the creation of stars]

[10] These phenomena can strip out all of the gas in a galaxy in a common explanation for quenching. Wolf-Rayet stars are notable for their high mass loss due to an analogous phenomenon for stars.

ANSWER: galactic **winds** [or stellar **winds**; or solar **winds**; prompt on **radiation**]

[10] The supermassive class of these astronomical objects can produce high galactic winds that often stifle star formation. Andrea Ghez and Reinhard Genzel won the 2020 Nobel Prize in Physics for detecting one of them at the center of the Milky Way.

ANSWER: supermassive **black holes**

<Other Science>

20. With a literacy rate reaching 90 percent by the American Revolution, New England developed a strong documentary culture. For 10 points each:

[10] Colonial children typically learned to read from these textbooks, like the McGuffey Readers. Benjamin Harris published the "New England" example of these books that most schools used before Noah Webster's Blue-Backed Speller.

ANSWER: **primers** [accept *The New England **Primer***; accept *McGuffey's Newly Revised Eclectic **Primer***]

[10] Ben Franklin's brother James published early examples of these documents like the *Newport Mercury* and *New England Courant*. As it was established in 1756, *The New Hampshire Gazette* claims to be the oldest in the US.

ANSWER: **newspapers** [or **periodicals**; or equivalents; prompt on **journals**]

[10] Martha Ballard, a Maine woman with this profession, recorded 30 years of history in a diary studied by Laurel Thatcher Ulrich. Valentine Seaman taught these women, who included Anne Hutchinson and were often targeted in witch trials.

ANSWER: **midwife** [or **midwives**; or **midwifery**; accept **obstetrics** or **birth** attendants or assisting child**birth** or **delivering babies** or similar; accept *A **Midwife's** Tale: The Life of Martha Ballard based on her diary, 1785–1812*; prompt on **healers** or **medicine** or similar]

<American History>

21. The adessive case marks possession in this language, whose many locative cases include superessive and elative. For 10 points each:

[10] Name this Uralic language with extensive gemination and vowel harmony. After centuries of Swedish colonization, this language's "strife" ended after it was standardized by Elias Lönnrot, who collected its oral poetry in the *Kalevala*.

ANSWER: **Finnish** [or **suomi**; or **suomen** kieli]

[10] Native Finnish words lack word-initial examples of these sound sequences, which are also prohibited by phonotactic constraints in Japanese. Epenthesis can bridge or break these sound sequences, which are common in Slavic and Kartvelian languages.

ANSWER: **consonant clusters** [or **consonant compounds**; accept **consonant blends**; accept **consecutive consonants** or **groups of consonants** or similar; prompt on **digraphs** or **trigraphs**; prompt on partial answers]

[10] Instead of being derived from a proto-language, the consonant clusters in Caucasian and Salishan ("SAIL-ish-in") languages may arise from this variable. Languages in a Sprachbund share similarities due to this variable, which is used to organize Australian and Papuan languages, rather than common descent.

ANSWER: **areal** features [or linguistic **areas**; or language contact **areas** or **geographic** area or **location** or similar; accept language **contact** or **influence** from other languages or equivalents; accept area of linguistic **convergence**; accept **diffusion** area; accept language **crossroads**]

<Social Science>