

# Saturnalia: Packet 12

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THESE TOSSUPS ARE PAIRED WITH BONUSES. IF A TOSSUP IS NOT CONVERTED, SKIP THE PAIRED BONUS AND MOVE ON TO THE NEXT TOSSUP. DO **NOT** COME BACK TO THE SKIPPED BONUS.

1. **A character in this play is slapped in the face after saying “there is only man and it is he who makes miracles.” Another character in this play exclaims, “I always wanted me one just like it!” after receiving an oversized gardening hat from her grandson. A character in this play receives a name meaning “one for whom bread is not enough” and is asked to become a doctor in (\*) Nigeria. A man in this play wastes his family’s inheritance by investing in Willy Harris’ liquor store. Despite opposition, the main characters of this play resolve to move into the white neighborhood of Clybourne Park. For 10 points, name this play about the Younger family by Lorraine Hansberry.**

ANSWER: *A **Raisin in the Sun***

<Drama — Louis Li> [Edited]

1. For a lever, this quantity equals the distance from the input to the fulcrum divided by the distance from the fulcrum to the load. For 10 points each:

[M] Name this quantity, which equals the force applied by a device divided by the force applied to the device. For an ideal inclined plane, this quantity equals one over the sine of the angle of inclination.

ANSWER: **mechanical advantage**

[E] Mechanical advantage describes the performance of these devices, which change the direction or magnitude of a force. Renaissance scientists defined six simple examples of these devices, including the lever and the inclined plane.

ANSWER: **machines** [accept simple **machines**]

[H] For a real inclined plane, friction causes the downhill mechanical advantage to become infinite at this angle. This angle is the steepest angle of incline at which an object can rest without sliding down.

ANSWER: angle of **repose**

<Physics — Daniel Ma> [Ed. French]

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2. **An informal poll in this country started a claim that one politician in it only had three percent support. In 2020, a politician from this country said that “Our society has not matured enough to vote for a woman.” This country’s protesters have waved slippers and chanted “Stop the cockroach” in protests. A member of this country’s coordination council ripped up her passport after she was forcibly taken to this country’s border. (\*) Svetlana Tikhanovskaya (“svaht-lah-nuh tih-khuh-NOVE-skah-yuh”) was forced to flee this country after she lost a rigged election. This country’s leader has been dubbed “Europe’s last dictator.” For 10 points, name this country where protests against its leader Alexander Lukashenko have occurred in Minsk.**

ANSWER: **Belarus** [or Republic of **Belarus**]

<Current Events — McAvoy-Bickford> [Edited]

2. Justice Byron White argued in his dissent of this case that since interrogation is not coercive, the Fifth Amendment does not protect against self incrimination in the case of police questioning. For 10 points each:  
[E] Name this Supreme Court case that ruled that suspects have the right to an attorney after its subject was forced to submit a confession. This case inspired a namesake set of rights, including the right to remain silent.

ANSWER: **Miranda v. Arizona** [accept **Miranda** rights]

[M] This Chief Justice wrote the majority opinion in *Miranda v. Arizona*. He also served as Chief Justice during the cases of *Gideon v. Wainwright*, which ruled that courts must provide an attorney if the defendant cannot provide one.

ANSWER: Earl **Warren**

[H] This justice wrote that *Miranda v. Arizona* was “part of our national culture” in his opinion in *Dickerson v. US*. This justice urged Robert Jackson to support the precedent in *Plessy v. Ferguson* while serving as Jackson’s clerk.

ANSWER: William **Rehnquist**

<U.S. History — Louis Li> [Ed. Iyer]

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3. **This leader lost the Forgotten War against the Army of Liberation, which sought freedom for one of his colonies. This leader created the office of prime minister after passing the Organic Law of the State. A prime minister under this leader was assassinated by detonating 180 pounds of explosives under his car in Operation Ogre. The Historical Memory law restricted actions occurring at this leader’s mausoleum in the Valley of the (\*) Fallen.** This leader, who came to prominence during the Rif War, was opposed by the Basque separatist organization ETA (“eh-tah”). This leader was succeeded by King Juan Carlos I (“the first”) as head of state. For 10 points, name this fascist dictator of Spain.

ANSWER: Francisco **Franco** (The Prime Minister was Luis Carrero Blanco.)

<European History — Athreya> [Ed. Iyer]

3. In this short story, Lieutenant Jimmy Cross burns his photographs and letters from Martha out of guilt. For 10 points each:

[H] Name this short story in which Ted Lavender is wrapped in his green plastic poncho after being shot in the head during an attack on the village of Than Khe.

ANSWER: “The **Things They Carried**”

[M] “The Things They Carried” is part of a short story collection with the same title by this American author. This author is known for his war memoirs.

ANSWER: Tim **O’Brien**

[E] O’Brien’s memoirs center on this war. In his autobiography *If I Die in a Combat Zone, Box Me Up and Ship Me Home*, he reflected upon coming across the remains of My Lai (“mee lie”) during his service in this war.

ANSWER: **Vietnam** War

<Short Fiction — Bowman> [Ed. Condron]

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4. **In one myth, this character digs up the head of Brân the Blessed to show that he can protect his realm without its magic power. In another myth, this character is crowned Roman Emperor after defeating Emperor Lucius in battle. A beast with the head of a serpent and the body of a leopard appears to this character after he sleeps with his (\*) half-sister, Morgause (“mor-GOHZ”).** This character’s legend was popularized by Geoffrey of Monmouth. At the battle of Camlann, this character is mortally wounded by Mordred, so he is taken to the Isle of Avalon. For 10 points, name this legendary king who ruled at Camelot with the Knights of the Round Table.

ANSWER: King **Arthur** [or **Arthur** Pendragon]

<Mythology — French> [Edited]

4. This poet wrote “the bush will never suit you, and you’ll never suit the bush” in response to Henry Lawson’s “Borderlands,” which was part of a poetic debate published in *The Bulletin*. For 10 points each:

[H] Name this bush poet of “Clancy of the Overflow” and “The Man from Snowy River.” Another poem by this author describes a “swagman” who camped “under the shade of a coolibah tree.”

ANSWER: Banjo **Paterson**

[M] In this song by Banjo Paterson, a swagman drowns himself in a billabong after a squatter confronts him about a “jumbuck in his tucker bag.” This song is considered the “unofficial national anthem” of Australia.

ANSWER: “**Waltzing Matilda**”

[E] The jumbuck that the swagman tries to steal is one of these animals. One of these animals is asked “have you any wool?” in an English nursery rhyme.

ANSWER: **sheep** [accept “Baa, Baa, Black **Sheep**”]

<Poetry — French> [Edited]

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5. In 2010, the Fermi Telescope discovered that one of these objects is surrounded by two large “bubbles” of gamma-ray emitting gas. A class of these objects has a luminosity roughly proportional to the fourth power of its velocity dispersion. A strongly infrared-emitting type of these objects was discovered by Carl Seyfert (“SEE-fert”). Analyses of these objects’ (\*) rotation curves provide evidence for their dark matter halos. These objects were classified by Edwin Hubble on his namesake “sequence,” and “irregular” ones of these include the Large and Small Magellanic Clouds. For 10 points, name these large-scale collections of stars exemplified by the Milky Way.

ANSWER: **galaxies** [or word forms like **galactic** or **galaxy**; accept Milky Way **Galaxy** or elliptical **galaxies** or Seyfert **galaxies** or active **galaxies** or active **galactic** nuclei or irregular **galaxies** or dwarf **galaxies** or spiral **galaxies**; prompt on **AGNs**] (The first clue refers to the Milky Way.)

<Astronomy — Yin> [Edited]

5. This country lost the Six-Day War while it was led by Salah Jadid. For 10 points each:

[E] Name this country that lost the Golan Heights to Israel during the Six-Day War. This country was governed by Hafez al-Assad until his death, after which his son Bashar al-Assad took power.

ANSWER: **Syria** [or **Syrian** Arab Republic or *al-Jumhūrīyah al-‘Arabīyah as-**Sūrīyah***]

[M] Salah Jadid, Hafez al-Assad, and Bashar al-Assad were all members of this current ruling party of Syria. This party shares its name and ideology with a similar political party in Iraq that was led by Saddam Hussein.

ANSWER: **Ba’ath** party [accept **Ba’athism**]

[H] Hafez al-Assad led an occupation of this conflict’s central country in 1976, an occupation that was not ended until Rafik Hariri’s death. The Kataeb party under Bashir Gemayal executed the Bus Massacre prior to this conflict.

ANSWER: **Lebanese Civil War** [or ***l-Harb al-Ahliyyah al-Libnāniyyah***; accept answers mentioning a **civil war** in **Lebanon**]

<World History — Athreya> [Ed. Iyer]

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6. Palettes called *yáng cài* (“yong tsai”) for artworks of this type are divided into families named for French colors. A pair of these artworks depict dragons and are named for Sir Percival David, who collected these artworks. The town of Jǐngdézhèn (“jing-duh-jun”) produced material for the Qīngbāi (“ching-bye”) type of these artworks. Works of this type called celadon use pale jade coloring. The (\*) black-figure style was supplanted by the red-figure style for artworks of this type in ancient Greece, such as amphorae (“am-fuhr-ee”). Cobalt and glass paste were used for the characteristic blue and white of some of these artworks. For 10 points, name these vessels constructed out of porcelain during the Míng dynasty.

ANSWER: **vases** [accept **pottery** or **ware** or **ceramics**; accept types of pottery like **urns** or **bowls**, prompt on **porcelain** or **china**]

<Painting and Sculpture — Bowman> [Edited]

6. The Mertens conjecture states that the sum of this function from 1 to  $n$  is bounded by plus or minus the square root of  $n$ . For 10 points each:

[H] Name this function, denoted  $\mu$  (“mu”), which is zero whenever its input is divisible by a square. For square-free inputs, this function equals one or negative one depending on whether the input has an even or odd number of prime factors.

ANSWER: **Möbius** function

[M] Although the Mertens conjecture has been proven false, it would have implied this earlier conjecture, which states that the zeros of a namesake zeta function are either negative even integers or have real part one-half.

ANSWER: **Riemann hypothesis** [prompt on **Riemann** or **RH**]

[E] The relation between Mertens and Riemann arises because the Dirichlet (“dee-ree-KLAY”) series for the Möbius function has this relationship to the Riemann zeta function. The fractions three-fourths and four-thirds have this relationship.

ANSWER: **reciprocal** [or multiplicative **inverse**]

<Math — French> [Edited]

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7. **The creation of this system as a part of the New Freedom domestic program was vehemently opposed by Charles Lindbergh, Sr. The creation of this system was inspired by a report from a commission led by Senator Nelson Aldrich. Anna Schwartz and Milton Friedman coined the term “Great Contraction” to describe this system’s failures during the early stages of the (\*) Great Depression.** After Franklin Roosevelt declared a bank holiday, the Emergency Banking Act gave this system the power to supply unlimited paper currency. For 10 points, name this central banking system of the United States that was created by a namesake act in 1913.

ANSWER: **Federal Reserve** System [or The **Fed**; do NOT accept or prompt on “Reserve”]

<U.S. History — Athreya> [Edited]

7. For 10 points each, answer the following about the Mexican city of Ciudad Juárez (“H’WAH-rez”):

[E] The Santa Fe bridge connects Ciudad Juárez with the city of El Paso in this U.S. state.

ANSWER: **Texas** [or **Tejas**]

[M] Many smugglers and illegal immigrants opt to cross this largest desert in North America in order to reach El Paso and the surrounding regions. This desert east of the Sonoran desert names a state in northern Mexico.

ANSWER: **Chihuahuan** (“chee-WAH-wahn”) desert [accept **Chihuahua**]

[H] Female workers in these factories near Ciudad Juárez have often been attacked by cartels. Many of these foreign-owned factories produce duty-free goods and were established across the U.S. border after NAFTA (“NAF-tuh”) was signed.

ANSWER: **maquiladoras** (“mah-kee-lah-DOH-rah’s”)

<Geography — Athreya> [Edited]

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8. **Robert McCrone called one of these objects initially found with a copy of The Tartar Relation a likely forgery because it contained modern anatase. One of these objects created by the monk Beatus (“bay-AH-toose”) to accompany his Commentaries on the Apocalypse may have inspired one found in Hereford (“HEH-ruh-furd”) Cathedral. Simple versions of these objects were made in the shape of the letters (\*) T and O. John Snow used one of these objects to find the source of a cholera outbreak on London’s Broad Street. Peters-Gall and Mercator are two projections used to make these objects.** For 10 points, name these flat objects produced by cartographers that depict an area.

ANSWER: **maps** [accept **mappa** mundi; prompt on **plots** or **charts**; prompt on **projections** with “onto what?”; do NOT accept or prompt on “globe”]

<Other — McAvoy-Bickford> [Edited]

8. This parliamentary body formed in the wake of the March Revolution of 1848. For 10 points each:

[H] Name this parliamentary body, whose leaders included Henrich von Gagern. When this body offered Frederick William IV (“the fourth”) the title of emperor, he purportedly said that he would not accept “a crown from the gutter.”

ANSWER: **Frankfurt** Parliament [or *Frankfurter Nationalversammlung*]

[M] This country’s king Frederick VII (“the seventh”) fought the Frankfurt Parliament and other German states over control of Schleswig and Holstein. This country’s king Christian IX (“the ninth”) signed the November Constitution, making Schleswig-Holstein part of it.

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

[E] Eventually, both Austria and this German state withdrew their delegates from the Frankfurt Parliament. It was led for much of the 18th century by Frederick the Great.

ANSWER: **Prussia** [or Kingdom of **Prussia** or *Preußen* or *Preussen* or *Prusa*]

<European History — Laurence Li> [Edited]

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9. This author wrote that man is “the fury and the mire of human veins” in a poem collected in *The Winding Stair*. This author lamented, “I sought a theme, and sought for it in vain,” in a poem that concludes with the speaker lying “in the foul rag and bone shop of the heart.” Another poem by this author declares, “an (\*) aged man is but a paltry thing / a tattered coat upon a stick,” after claiming, “that is no country for old men.” A poem by this author describes “a vast image out of Spiritus Mundi” before asking, “what rough beast, its hour come round at last, / Slouches towards Bethlehem to be born?” For 10 points, name this Irish poet of “Sailing to Byzantium” and “The Second Coming.”

ANSWER: William Butler **Yeats**

<Poetry — Raymond Wang> [Ed. Condron]

9. A hymn praising this deity states “Truth is best of all that is good. As desired, what is being desired is truth for him who represents the best truth.” For 10 points each:

[M] Name this God of Wisdom who is often contrasted with his evil twin, Ahriman (“AH-rih-mun”).

ANSWER: **Ahura Mazda** [or **Ormazd**]

[E] Ahura Mazda is venerated in this Persian dualistic religion founded by a namesake prophet. This religion’s main text is the Avesta.

ANSWER: **Zoroastrianism** [or **Magianism**]

[H] The Avesta’s core is this set of hymns praising Ahura Mazda, which are believed to be written by Zoroaster himself. These texts form the core of the Yasna (“YUSS-nuh”).

ANSWER: **Gathas**

<Religion — McAvoy-Bickford> [Ed. Dai]

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10. A specialized form of this technique uses bisulfite ions to deaminate (“dee-AM-in-ate”) the non-methylated form of a certain substituent. Another form of this technique applies an electric field to force the analyte through a nanopore such as alpha hemolysin. A commonly-used form of this technique splits the analyte using chain-terminating ddNTPs (“D-D-N-T-P’s”), then separates the fragments via (\*) gel electrophoresis; that form of this technique was developed by Frederick Sanger. The results of this technique are often aligned with existing data using BLAST (“blast”). This technique was used to complete the Human Genome Project. For 10 points, name this lab technique that determines the order of nitrogenous bases in DNA.

ANSWER: DNA **sequencing** [or gene **sequencing** or genetic **sequencing** or genome **sequencing**; accept whole-genome **sequencing** or bisulfite **sequencing** or nanopore **sequencing** or dideoxy **sequencing** or Sanger **sequencing** or shotgun **sequencing**] (Bisulfite ions deaminate non-methylated cytosine.)

<Biology — Yin> [Edited]

10. Second Style Roman painters employed a form of this technique in wall paintings that uses multiple vanishing points. For 10 points each:

[E] Name this technique whose one-point linear variety uses a vanishing point along a horizon line to create the illusion of a three-dimensional image. Filippo Brunelleschi (“broon-eh-LEHS-kee”) used a mirror to discover that form of this technique.

ANSWER: perspective [or one-point linear perspective]

[H] Mantegna’s (“man-TEHN-yuh’s) painting *The Dead Christ* uses this perspective technique by displaying the body of Jesus vertically with the feet closest to the viewer. This technique creates the illusion of an object receding into the background.

ANSWER: foreshortening [accept word forms like foreshortened]

[M] Works of this type in the Hall of Bulls use twisted perspective to combine profile and frontal views of the bulls’ horns and body. After viewing those works of this type, Picasso declared that “We have learned nothing.”

ANSWER: cave paintings [prompt on caves or paintings]

<Painting and Sculpture — Condron> [Ed. Bowman]

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11. **Slavoj Žižek** (“SLAW-voy ZHEE-zhek”) described a man in this film peeking through a door at a woman in a flower shop as viewing reality from an “obscure netherworld.” One shot in this film zooms in on a spiral in a woman’s hair, before panning up to reveal her looking at a portrait of a woman with the same hairstyle. A character in this film who pretends to be possessed by the ghost of Carlotta Valdes is played by (\*) Kim Novak. This film pioneered the dolly zoom in shots looking down the stairs of a bell tower, where a detective confronts Judy about her impersonation of Madeleine Elster. For 10 points, name this Alfred Hitchcock film about the investigator Scottie, who has a fear of heights.

ANSWER: Vertigo

<Film — Faeder> [Ed. Bowman]

11. In one model, this process occurs in two distinct layers separated by a 660-kilometer transition zone. For 10 points each:

[E] Name this process, which was formerly thought to be the primary driver of tectonic plate motion. In the mantle, this mode of heat transfer is more effective than conduction and radiation.

ANSWER: mantle convection

[H] This force is currently thought to be the primary driver of plate motion. Ridge push is contrasted with this force, which is caused by the weight of dense oceanic crust as it sinks into the mantle.

ANSWER: slab pull [do NOT accept or prompt on “slab suction”]

[M] Slab pull occurs at plate boundaries of this type. The Pacific Ring of Fire consists of these plate boundaries, where megathrust faults are sources of deep-focus earthquakes.

ANSWER: convergent plate boundaries [prompt on subduction zones by asking “at what type of boundary does subduction take place?”]

<Earth, Atmospheric, and Oceanic Science — Yin> [Ed. French]

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12. **They’re not utility functions, but the CES (“C-E-S”) function for this process can be used to find the Leontief and Cobb-Douglas functions for it by taking limits of the substitution parameter. Inputs to functions representing this process may be fixed in the short run, but not in the long run. Points that lie on a (\*) curve named for this process are called efficient, while points that lie inside it are inefficient. That curve is determined by the given resources and technology and is known as this process’s possibilities frontier. Land, labor, and capital are the primary factors of this process. For 10 points, name this process, the act of creating a good or service.**

ANSWER: production [accept Cobb-Douglas production function or Leontief production function or production possibilities frontier or factors of production]

<Economics — Zhou> [Ed. French]

12. This novel's final chapter describes the protagonist's son Wilder riding his tricycle across a busy street. For 10 points each:

[H] Name this novel in which Jack Gladney argues with his other son Heinrich about the metaphysics of rain. In this novel, Jack's wife Bette tries to treat her fear of death with the drug Dylar.

ANSWER: White Noise

[E] Jack Gladney tries learning German as part of his studies of this Nazi dictator who wrote *Mein Kampf*.

ANSWER: Adolf Hitler

[M] *White Noise* is a novel by this postmodern American author of *Mao II* ("two") and *Libra*.

ANSWER: Don DeLillo [or Donald Richard DeLillo]

<Long Fiction — Condon> [Edited]

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13. **A character in a short story by this author imagines "a long procession of years to come that would belong to her absolutely." The protagonist of a novel by this author moves into a "pigeon house" after an outburst at a party. That novel by this author begins with a parrot shrieking "allez vous-en" ("ah-LAY voo-ZON"). This author wrote a short story in which (\*) Louise Mallard dies of a heart attack after discovering her husband is still alive. In a novel by this author, the protagonist has affairs with Alcée Arobin ("al-SAY ar-oh-BAHN") and Robert Lebrun before drowning herself in the Gulf of Mexico. For 10 points, name this author of "The Story of an Hour" who wrote about Edna Pontellier (POHN-tuhl-yay) in *The Awakening*.**

ANSWER: Kate Chopin

<Short Fiction — Orr> [Edited]

13. The *kulit* variety of one art form from this country involves the use of linen screens and lamps, while the *orang* or *wong* variety involve real-life theatrical adaptations. For 10 points each:

[H] Name this country home to *wayang* theater.

ANSWER: Indonesia

[E] *Wayang* refers either to these objects or theater performances using these objects. These objects may be manipulated by sticks to cast shadows or by hand, as in their sock variety.

ANSWER: puppets

[M] *Wayang* performances are often accompanied by these traditional musical ensembles. Many metallophone instruments, such as a collection of small gongs known as *bonang*, are used in these musical ensembles.

ANSWER: gamelan

<Misc. Art — Athreya> [Ed. Jeffrey Ma]

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14. **An octahedral complex must contain at least this many d electrons for it to be characterizable as either high-spin or low-spin. The hypothetical g orbital would contain this many angular nodes, since it would have an angular quantum number with this value. In VSEPR ("vesper") theory, atoms with (\*) see-saw geometries contain this many substituents and one lone pair. A geometry with this many substituents has bond angles of 109.5 ("one-hundred nine point five") degrees. This is the maximum number of bonds that any period 2 element can have. This is the lowest principal quantum number whose energy level contains f orbitals. For 10 points, give this number of substituents in a tetrahedral molecule.**

ANSWER: four

<Chemistry — Ye> [Edited]

14. Benjamin Constant objected to this principle by arguing that it is ethical to lie to a murderer, because telling the truth would make you complicit in someone's death. For 10 points each:

[M] Name this ethical principle which states that any action you take should have a rationale that could become a universal law.

ANSWER: **categorical imperative**

[E] This German Enlightenment philosopher introduced the categorical imperative in his *Groundwork of the Metaphysics of Morals*. He also wrote a series of three critiques, including the *Critique of Pure Reason*.

ANSWER: Immanuel **Kant**

[H] In the *Groundwork*, Kant presented this thought experiment to argue in favor of the categorical imperative. In this thought experiment, no one is treated as a means to another's selfish goals.

ANSWER: **Kingdom of Ends** [or **Realm of Ends** or **Reich der Zwecke**]

<Philosophy — Bowman> [Ed. Ashbrook]

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15. **A future ruler of this country was advised by St John ("sin jin") Philby to form a monopoly on a certain commodity. That future ruler of this country recognized the sovereignty of the Trucial States in the Darin Pact and won the 1929 battle of Sabilla against the Ikhwan militia. This country was formed after one of its rulers gained control of Najd after defeating the (\*) Rashid clan. That ruler of this country, which is not Jordan, defeated Sharif Hussein of the Hashemite dynasty to take control of Hejaz. After an agreement with Standard Oil, the Aramco company was formed in this country. For 10 points, name this largest country in the Arabian peninsula, whose crown prince is Muhammad bin Salman.**

ANSWER: **Saudi Arabia** [or Kingdom of **Saudi Arabia**; or *Al-Mamlakah al-'Arabīyah as-Sa'ūdīyah*; prompt on **KSA** or **SA**]

<World History — Iyer> [Edited]

15. In this technique, chemical shift is found by comparing a sample's absorption frequency to that of tetramethylsilane. For 10 points each:

[M] Name this technique, which subjects organic samples to a strong static magnetic field and measures the frequency of radiation needed to flip the spin states of certain nuclei.

ANSWER: **nuclear magnetic resonance** spectroscopy [or **NMR** ("N-M-R") spectroscopy; accept proton **NMR** or carbon-13 **NMR**]

[E] Two common types of NMR are proton NMR, which observes hydrogen nuclei, and a type that observes the 13 isotope of this element. The 12 isotope of this element is used to define the atomic mass unit.

ANSWER: **carbon** [or **C**]

[H] In proton NMR, hydrogen atoms with this property absorb the same wavelength of radiation and thus have the same chemical shift. Hydrogen atoms with this property can be exchanged by symmetry.

ANSWER: **chemical equivalence** [accept word forms like **chemically equivalent**; prompt on **equivalence**]

<Chemistry — Athreya> [Ed. Gurazada, French]

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16. **A character created by this author suspects that the authorities intentionally display an inaccurate thermometer. In a novel by this author, the tiny print of a *Vechorka* newspaper is noted while a character waits in line for packages belonging to the former film director Tsezar ("seh-zar"). A novel by this author ends with a piece of sausage being offered to the Baptist (\*) Alyosha by a *zek* who lays bricks under the direction of Tyurin as part of the 104th. For 10 points, name this author who described the Shukov's experiences in the novel *One Day in the Life of Ivan Denisovich* and who wrote a massive chronicle of the Soviet system of forced labor titled *The Gulag Archipelago*.**

ANSWER: Aleksandr **Solzhenitsyn** ("sohl-zhuh-NEET-sin") [or Aleksandr Isayevich **Solzhenitsyn**]

<Long Fiction — McAvoy-Bickford> [Ed. Condrón]



16. This empire was decisively defeated by Judar Pasha at the Battle of Tondibi. For 10 points each:

[M] Name this empire founded by Sunni Ali, who established Gao as its capital. This empire reached its zenith under Askia Muhammad, who founded a namesake dynasty.

ANSWER: **Songhai** Empire

[H] The Songhai Empire was conquered by the Saadi dynasty, which ruled this modern-day country. The Saadi dynasty had earlier come to power by winning the Battle of Alcácer Quibir in this modern-day country.

ANSWER: Kingdom of **Morocco**

[E] At its peak, the Songhai Empire controlled much of the trade through this desert. This largest desert in the world was often traversed by caravans carrying gold, salt, and other goods.

ANSWER: **Sahara** Desert

<World History — Athreya> [Edited]

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17. **The main theme of a piece in this form starts on E and diverges chromatically, giving it the nickname of “The Wedge.” They’re not symphonies, but two G minor keyboard pieces in this form are nicknamed “little” and “great,” the latter of which its composer paired with a fantasia. In this form, a (\*) stretto is an imitation of the subject played before the prior entry has completed. After the subject of this form is introduced by the first voice, other voices repeat the subject in different pitches. For 10 points, name this contrapuntal form exemplified by one Johann Sebastian Bach paired with a toccata in D minor.**

ANSWER: **fugues** [or **fuga**]

<Classical Music — Daniel Ma> [Ed. Jeffrey Ma]

17. This protein complex reduces plastoquinone (“plast-oh-KWIN-own”) and oxidizes plastocyanin (“plast-oh-SYE-uh-nin”) during cyclic electron flow. For 10 points each:

[H] Name this protein complex. During non-cyclic electron flow, ferredoxin transfers electrons from this protein complex to NADP<sup>+</sup> (“N-A-D-P plus”).

ANSWER: **Photosystem I** [or **PS I** (“P-S one”); prompt on **photosystems** or **PS**; prompt on **electron transport chain** or **ETC**; do NOT accept or prompt on “Photosystem II” or “PS II”]

[M] Photosystem I is located on the membranes of these structures. The cytochrome b<sub>6</sub>f (“B-six-F”) complex creates an electrochemical gradient by pumping protons into these sac-like structures found in chloroplasts.

ANSWER: **thylakoids**

[E] The thylakoid electron transport chain comprises the light-dependent reactions of this general process. Plants use this process to create sugars from light, water and carbon dioxide.

ANSWER: **photosynthesis**

<Biology — Athreya> [Ed. Yin]

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18. **Conservative military officers did not allow this man to lead a peasant army to protect Frederick William IV (“the fourth”) from a popular revolt. Following his dismissal, this leader was depicted walking off of the ladder off a ship in the cartoon “Dropping the Pilot.” This leader signed the Reinsurance Treaty after his League of the Three Emperors failed to balance power in Europe. This leader edited the (\*) Ems dispatch to provoke a war with France. In an 1862 speech, this leader stated that “the great questions of our day [will] be decided... by Iron and Blood.” For 10 points, name this “Iron Chancellor” who engineered the 19th century unification of Germany.**

ANSWER: Otto von **Bismarck**

<European History — Louis Li> [Ed. Iyer, Laurence Li]

18. Johann Sebastian Bach's second annual cycle of these pieces contains one of his most popular, *Wachet auf, ruft uns die Stimme* ("VAH-ket OWFF, rooft oons dee SHTIM-uh"), better known as "Sleepers Wake." For 10 points each:

[M] Name these pieces of which Bach wrote over 200, mostly for the church. About 50 of them were secular, including ones about hunting and coffee.

ANSWER: cantatas

[E] Despite the sheer number of cantatas he wrote, Bach's most popular sacred work by far is a B minor one of these works. These works set the Catholic liturgy to music and begin with a "Kyrie" ("KEE-ree-ay").

ANSWER: mass [or *missa* or *missa*]

[H] Bach's output also includes some 400 of these settings of Lutheran hymns. These four-part settings are generally homophonic, adapting pre-existing tunes and harmonizing it for SATB ("S-A-T-B") choir.

ANSWER chorales [or chorale harmonization]

<Classical Music — Daniel Ma> [Ed. Jeffrey Ma]

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19. **The Periya Puranam** ("peh-REE-uh puh-RAH-num") was composed by sixty-three poet-saints who worshipped this deity called the Nayanars ("NAH-yuh-NAR's"). A block of ice is worshipped as a fallen body part of this deity in the Amarnath ("uh-mur-NATH") cave. This deity is addressed in the Maha Mrityunjaya Mantra ("muh-HAH m'rih-T'YUN-jay-uh MAHN-truh") as the "tryambakam" ("trih-YUM-buh-kum"). A predecessor to this deity, who is regarded as a wrathful storm god who must be pacified, is found in the Rig Veda; that deity is (\*) Rudra. This three-eyed deity is represented as a phallic structure known as a *lingam* and portrayed as the *Nataraja* ("NAH-tuh-RAH-juh"), the cosmic dancer. For 10 points, name this Hindu god who forms the *trimurti* along with Vishnu and Brahma.

ANSWER: Shiva [or Siva]

<Religion — Athreya> [Ed. Dai]

19. A member of this profession who was trained by Aunt Lydia is treated as an enemy of the state and survives a pair of assassination attempts. For 10 points each:

[M] Name this profession whose members are referred to by their Commander's name prefixed by the particle "Of."

ANSWER: handmaids [accept *The Handmaid's Tale*]

[E] This Canadian author included Aunt Lydia in *The Handmaid's Tale*, which is set in the dystopian society of Gilead.

ANSWER: Margaret Atwood

[H] In this sequel to *The Handmaid's Tale*, Nicole lives in Canada under the name Daisy, and Agnes discovers that the regime of Gilead has been rewriting the Bible.

ANSWER: *The Testaments*

<Long Fiction — McAvoy-Bickford> [Ed. Mayers, Condron]

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20. A 1988 experiment by the European Muon Commission determined that the proton's value for this quantity is not a sum of the values of its quarks. When a nucleus has a non-zero value of this quantity, it has a non-zero magnetic moment, causing hyperfine splitting. This quantity was shown to be quantized by sending silver atoms through an inhomogeneous magnetic field in the (\*) Stern-Gerlach experiment. Particles with half-integers values of this quantity follow Fermi-Dirac statistics and obey the Pauli exclusion principle, unlike bosons. For 10 points, name this intrinsic angular momentum of a particle, which for an electron is either "up" or "down."

ANSWER: spin

<Physics — Ye> [Ed. French]

20. In 2020, a quarterback who attended this university signed a one-year contract with the New Orleans Saints to be the backup to Drew Brees. For 10 points each:

[H] Name this university. This university won the 2014 National Championship game over Auburn after an eighteen point comeback capped by a game winning touchdown pass to Kelvin Benjamin.

ANSWER: **Florida State** University [or **FSU** or **Seminoles**]

[M] This quarterback threw that game winning touchdown to Kelvin Benjamin. This quarterback threw 30 touchdowns and 30 interceptions in the 2019 season, which he played with the Tampa Bay Buccaneers.

ANSWER: Jameis **Winston**

[E] Despite losing Kelvin Benjamin to an ACL tear in the 2015 season, this Panthers quarterback was still able to win MVP and take his team to Super Bowl 50, popularizing the dab along the way. He now plays for the New England Patriots.

ANSWER: Cam **Newton**

<Popular Culture — Louis Li> [Ed. Maharjan]