

# Saturnalia: Packet 5

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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. **These animals name a “pump” in which their feces return large amounts of iron and nitrogen to nutrient-poor surface waters. “Enrichment opportunists” such as *Osedax* zombie worms derive their nutrition from lipids found in these animals’ bones. Many of these animals possess a fat-filled forehead called a melon. These animals are divided into two clades based on whether or not they possess (\*) teeth. A species of these animals that preys on the giant squid was once hunted for its spermaceti (“sperm-uh-SET-ee”). Many “great” species of these animals filter-feed on krill using baleen. For 10 points, name this order of marine mammals whose “blue” species is the largest animal on Earth.**

ANSWER: **whales** [or **cetaceans** or **Cetacea**; accept **whale** pump or **whale** falls or toothed **whales** or sperm **whales** or great **whales** or baleen **whales** or blue **whales**; prompt on **Odontoceti** or **Mysticeti** or **dolphins** or **porpoises** or **orcas** or **rorquals** by asking “what infraorder are those animals a part of?”]

<Biology — Yin> [Edited]

1. Many people have started jokes about places in Europe not existing. For 10 points each:

[H] After a joking conspiracy theory claimed that its existence was actually a cover-up, this German city in North Rhine-Westphalia offered one million euros to anybody who could prove its non-existence.

ANSWER: **Bielefeld**

[M] This country’s newest region on the first administrative level, Molise, is also said to not exist. That region is this country’s second smallest region after the Aosta Valley and is directly north of Campania.

ANSWER: **Italy**

[E] Another ridiculous theory claims that this country doesn’t exist, and that anybody claiming to be from it is actually from its neighbours of Sweden and Russia. This country also borders Norway.

ANSWER: **Finland**

<Geography — McAvoy-Bickford> [Ed. Daniel Ma]

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2. **In a story by this author, a man pursues a couple to the Church of St. Monica before they pull him off the street to be the witness to their wedding. In a novel by this author, the two Mormons who kill John Ferrier and his daughter Lucy are pursued by a vengeful cab driver named Jefferson Hope. Dr. Roylott’s pet swamp adder is the title (\*) “Speckled Band” of a story by this author. A man known as Count von Kramm seeks to destroy photographic evidence of his relationship with Irene Adler in this author’s story “A Scandal in Bohemia.” For 10 points, name this author of *A Study in Scarlet* who wrote mysteries featuring Dr. Watson and Sherlock Holmes.**

ANSWER: Sir Arthur Conan **Doyle**

<Short Fiction — Bowman> [Edited]

2. For 10 points each, answer some questions about Republicans who have strongly opposed Trump:

[H] This former CIA officer ran against Trump as an independent in 2016. This candidate received twenty-one percent of the vote in his home state of Utah.

ANSWER: David Evan **McMullin**

[E] This senator was the only Republican senator to vote to convict Trump in his impeachment proceedings. This senator, who currently represents Utah, was the Republican nominee against Obama for the 2012 election.

ANSWER: Willard Mitt **Romney**

[M] George Conway was one of the founders of this group of Republicans opposing Trump, who endorsed Joe Biden in April 2020. This group gained prominence for their anti-Trump ads, including one in the form of Reagan's Morning in America ad.

ANSWER: The **Lincoln Project**

<Current Events — McAvoy-Bickford> [Edited]

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3. **An artist from this country depicted a young girl dreaming about adventures on her apartment rooftop on a “story quilt” entitled *Tar Beach*. An artist from this country referred to his style as “dynamic cubism” and depicted crowds of people at train stations in his *Migration* series. A leader of this country is seated in a chair in front of a lush, green background in a portrait by (\*) Kehinde Wiley. A splattered tomato and a racial slur appear on a wall behind a girl from this country in *The Problem We All Live With*. For 10 points, name this home country of Norman Rockwell, who depicted core principles of this country in his *Four Freedoms* series.**

ANSWER: **United States** [or United States of **America** or **U.S.** or **USA**] (*Tar Beach* is by Faith Ringgold; the *Migration* series is by Jacob Lawrence.)

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

3. During this event, Gail Halvorsen was nicknamed the “Candy Bomber” because he dropped packages of candy attached to miniature parachutes. For 10 points each:

[M] Name this event dubbed “Operation Vittles” in which American and British planes flew supplies into Tempelhof Airport to circumvent a Soviet Blockade.

ANSWER: **Berlin Airlift**

[E] The Soviet blockade of Berlin foreshadowed the erection of this barrier that divided west and east Berlin. John F. Kennedy gave a speech at this barrier where he stated “Ich bin ein Berliner” (“ihkh bin ine BEAR-leen-er”) in June of 1963.

ANSWER: **Berlin Wall** [or **Berliner Mauer**; accept **Antifascist Bulwark** or **Antifascistischer Schutzwall**]

[H] This man introduced the Deutsche Mark to West Berlin. This second chancellor of West Germany served as Minister of Economic Affairs during a period of growth known as the “Miracle on the Rhine.”

ANSWER: Ludwig Wilhelm **Erhard**

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

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4. **One side in a 1622 war over this commodity was led by Antonio Xeldres (“SHEL-drez”). The town of Huancavelica (“WAN-ka-veh-LEE-ka”) was an important source of mercury, which was used to produce this resource through the patio process. Viceroy Francisco de Toledo used the *mit'a* (“mee-tah”) system to recruit forced labor to extract this resource, which was used to make (\*) coins known as Pieces of Eight. Galleons carrying this metal made regular voyages between Acapulco and Manila. The Spanish used indigenous labor to mine this metal near the city of Potosí (“poh-toh-SEE”) in modern-day Bolivia. For 10 points, name this precious metal which was mined in larger quantities than gold in Latin America.**

ANSWER: **silver** (The war was the Vicuña war)

<World History — Athreya> [Ed. Laurence Li, Iyer]

4. Whether this quantity is positive, negative, or zero indicates if two products are substitutes, complements, or unrelated. For 10 points each:

[H] Name this quantity given by the percent change in the quantity demanded of one good divided by the percent change in the price of another good.

ANSWER: **cross elasticity** of demand [or **cross-price elasticity** of demand; prompt on **elasticity** or **elasticity** of demand; do NOT accept or prompt on “price elasticity” or “price elasticity of demand”]

[E] Perfectly inelastic demand occurs when a good has no substitutes. Such a scenario may occur in this market structure in which only a single firm operates.

ANSWER: **monopoly**

[M] Firms engaging in this strategy will offer a lower price to customers with more elastic demand. In this practice, a firm charges different prices for the same product in different markets.

ANSWER: **price discrimination**

<Economy — Condron> [Edited]

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5. **This piece begins with the bassoon then basset horn descending from a half note D to a quarter note C-sharp, part of a theme inspired by Handel’s *Funeral Anthem for Queen Caroline*. In a 12/8 *larghetto* section of this piece, sighing violins repeat an eighth rest, eighth note, eighth note figure. A trombone outlines a B-flat major chord to begin this piece’s (\*) “Tuba Mirum” section. This piece was completed by Franz Xavier Sussmayr after its composer’s death left this piece incomplete beyond the first nine bars of its “Lacrimosa.”** For 10 points, name this mass for the dead, the final composition of Wolfgang Amadeus Mozart.

ANSWER: ***Requiem in D minor*** by Wolfgang Amadeus **Mozart** [accept equivalents like ***Mozart’s Requiem***; accept just ***Requiem*** after “Mozart”; prompt on ***Requiem in D minor*** before “Mozart” by asking “by what composer?”; accept **Requiem Mass** in place of “Requiem”; do NOT accept or prompt on “Mass”]

<Classical Music — Jeffrey Ma> [Edited]

A group known as “The Promoters” formed the “People’s Party” in this country in 1927. For 10 points each:

[M] Name this country where the Khana Ratsadon (“KUN-ah RAT-sa-don”) executed a coup in its capital, ending the rule of King Prajadhipok (“pra-JA-dee-poke”). This country’s earlier Ayutthaya (“ah-yoo-THA-ya”) kingdom was ended by Taksin (“tak-SEEN”) the Great of the Thonburi (“thohn-boo-ree”) kingdom.

ANSWER: **Thailand** [or Kingdom of **Thailand** or **Siam** or *Ratcha-anachak Thai* or **Rattanakosin** kingdom]

[H] Prajadhipok was the seventh ruler of this dynasty that ruled the Rattanakosin (“rah-ta-na-KOH-sin”) kingdom of Thailand. The fourth ruler of this dynasty, Mongkut (“MONG-koot”), hired Anna Leonowens to tutor his children.

ANSWER: **Chakri** [or Ratchawong **Chakkri**]

[E] The Khana Ratsadon manifesto signaled the end of this system of rule in Thailand. Unlike a constitutional monarchy, the king does not hold any restrictions on power under this type of monarchy.

ANSWER: **absolute** monarchy [or **absolute rule**; accept word forms such as **absolutism**; accept **despotism** or word forms such as **despot**; prompt on **authoritarian** rule or **totalitarian** rule or **authoritarianism** or **totalitarianism**]

<World History — Iyer> [Edited]

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6. **The efficiency of liquid-liquid extraction depends on a type of this quantity called the partition coefficient. This quantity can be non-dimensionalized by defining it as a ratio of activities. Two forms of this quantity are related by a factor of RT (“R-T”) raised to the power of the change in moles of gas. The law of (\*) mass action can be used to compute this quantity. If the reaction quotient Q is greater than this quantity, then the reaction will favor the reactants. For 10 points, name this constant equal to the ratio of concentrations of the products and reactants when net concentrations are unchanging, symbolized by a capital K.**

ANSWER: **equilibrium constant** [accept **equilibrium** after “constant”; prompt on  $K_{eq}$  or  $K_c$  or  $K_p$  or  $K_d$  or  $K$  before “K”]

<Chemistry — Ye> [Ed. French]

6. For 10 points each, answer the following about divination in ancient Rome:

[M] These state priests were in charge of reading the signs, or auspices, sent by the gods. Primarily, these priests observed lightning strikes and the behavior of birds.

ANSWER: **augurs** [accept **augury**]

[H] During the Republic, Romans often consulted these Etruscan priests. These priests predicted the future by reading the entrails of sacrificed animals, particularly the livers of sheep.

ANSWER: **haruspex** [or **haruspices**; accept **haruspicy**]

[E] Romans could also attend a *sortes* (“SOR-tays”), where they predicted their future by drawing lots. The lots were often verses of famous poets such as this Roman author of the *Aeneid* (“eh-NEE-id”).

ANSWER: **Virgil** [or **Vergil** or Publius **Vergilius** Maro]

<Mythology — McAvoy-Bickford> [Ed. French]

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7. **This character questions a group’s understanding of “manhood and freedom” before inciting a riot by throwing pillboxes out of a window. After asserting the “right to be unhappy,” this character is haunted by a crowd singing “Orgy-porgy” outside of the lighthouse where this character hangs himself. After reading *Hamlet*, this character attempts to stab (\*) Popé (“poh-PAY”) for sleeping with his mother Linda. This character is shown an archive of forbidden books by World Controller Mustapha Mond. For 10 points, name this character from Aldous Huxley’s *Brave New World* nicknamed “the Savage.”**

ANSWER: **John** the Savage [or John the **Savage** before “Savage” is read]

<Long Fiction — Raymond Wang> [Ed. Condrón]

7. This artist painted a triptych whose panels include *An Allegory of Gluttony* and *Death and the Miser*. For 10 points each:

[M] Name this artist who, in the third painting of that triptych, depicted a friar and a lute-playing nun fighting over a piece of food on the title *Ship of Fools*.

ANSWER: Hieronymus **Bosch**

[E] This other Bosch triptych contains men whose legs turn into tree trunks in its “Hell” panel. This triptych depicts Eden in its leftmost panel.

ANSWER: *The **Garden of Earthly Delights***

[H] Bosch depicted a blade sandwiched between two of these body parts in the “Hell” panel of *The Garden of Earthly Delights*. In a drawing, Bosch depicted these body parts in a forest in reference to an old Dutch saying.

ANSWER: **ears**

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

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8. **After it was used in this state, the Enforcement Act was ruled unconstitutional in *United States v. Cruikshank*. This state’s White League massacred over sixty black Republicans in the city of Colfax. A governor of this state wrote a book called “My First Days in the White House” detailing his plans for a presidential bid. That governor of this state distributed (\*) free textbooks and repealed a poll tax as part of his “Share Our Wealth” initiative, which had the motto “Every Man a King.” Carl Weiss assassinated a governor of this state who was nicknamed “Kingfish.” For 10 points, name this state once led by Huey Long.**

ANSWER: **Louisiana**

<U.S. History — Athreya> [Ed. Laurence Li]

8. Ethel Nelson's book *God's Promise to the Chinese* argues that characters from ancient oracle bones reflect narratives from this book. For 10 points each:

[E] Name this first book of the Bible.

ANSWER: **Genesis**

[M] Nelson explains that the ancient Chinese character for "garden," *yuan*, is a combination of the character for "enclosure" outside of the characters for "people," "breath," and this substance. In the Book of Genesis, God creates Adam by giving breath to this substance.

ANSWER: **dust** [accept **dirt** or **earth**; do NOT accept or prompt on "clay"]

[H] The ancient Chinese character *zhou* ("joe"), or "boat," is formed from the characters for "vessel," "people," and the character for this number, which according to Nelson reflects the fact that Noah's ark carried this number of people.

ANSWER: **eight** [or **bā**] (The people are Noah, his wife, his three sons, and their wives.)

<Religion — Dai> [Edited]

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9. **Cold temperatures cause some varieties of these objects to have a higher ratio of strontium to calcium. Rangeomorphs ("RAN-jee-oh-morfs") are a type of these objects that unusually exhibit a four-level fractal structure. Mary Anning discovered the origin of a class of these objects called coprolites ("COP-ruh-lites"), which form through the process of (\*) permineralization. The relative ages of sedimentary rocks are often found by identifying "index" examples of these objects. The Burgess Shale contains many intact examples of these objects from the Cambrian period, including those of trilobites. For 10 points, name these preserved remains of once-living organisms.**

ANSWER: **fossils** [accept **fossilized organisms/animals** or **microfossils** or **Ediacaran fossils** or **index fossils**; prompt on **coprolites** (until it is read) or **casts** or **molds** by asking "which are a subtype of what objects?"]

<Earth, Atmospheric, and Ocean Science — Dai> [Ed. Yin]

9. In one function, this molecule blocks adenosine from binding to A1 ("A-one") and A2A ("A-two-A") receptors. For 10 points each:

[E] Name this stimulant that provides the energy kick from drinking coffee.

ANSWER: **caffeine**

[H] Caffeine is one of these molecules, defined as organic compounds that contain nitrogen in their heterocycle and have effects on human physiology. Some of these compounds are derivatives of indole.

ANSWER: **alkaloids**

[M] Emil Fischer performed the first synthesis of caffeine through the N-methylation of theobromine in the presence of this strong base. This base reacts with hydrochloric acid to form table salt and water.

ANSWER: **sodium hydroxide** [or **NaOH** ("N-A O-H"); prompt on **lye**]

<Chemistry — Bowman> [Edited]

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10. **Menoecus ("muh-NEE-see-us") dies by jumping from a wall at this place in the tenth book of an epic by Statius ("STAY-shee-us"). After attacking this place, Alcmaeon ("alk-MEE-un") and Amphilocheus ("am-FIH-law-kuhs") kill their mother for convincing their father Amphiaraus ("am-fee-uh-RAY-us") to join a failed attack on this place. A goddess who marries a king of this place is given a necklace that brings (\*) misfortune to all its owners. The Epigoni ("eh-PIG-oh-nye") successfully capture this city after their seven fathers fail to take this city from Eteocles ("eh-TEE-uh-cleez"). A king of this city blinds himself after discovering that he married his mother Jocasta ("yoh-CAST-uh"). For 10 points, name this Boeotian ("bee-OH-shin") city founded by Cadmus and ruled by Oedipus ("EH-duh-pus").**

ANSWER: **Thebes**

<Mythology — Ashbrook> [Ed. French]

10. An avenue of ram-headed sphinxes connects this site's Precinct of Mut to its Precinct of Amun. For 10 points each:

[H] Name this site, which in ancient times was called "The Most Select of Places." This site's Temple of Amun-Ra contains a Great Hypostyle Hall.

ANSWER: **Karnak** [or **Karnak Temple Complex**; or *Ipet-isut*]

[E] Karnak's Great Hypostyle Hall contains 134 of these structures sculpted to resemble stalks of papyrus. Doric, Ionic, and Corinthian are the three main orders of these structures in classical architecture.

ANSWER: **columns** [or **pillars**]

[M] The Hypostyle Hall was built out of this material and sandstone. The Great Mosque of Djenné is an example of this material's use in Sudano-Sahelian architecture.

ANSWER: **mud** brick [accept **adobe** or **banco**]

<Architecture — French> [Ed. Bowman]

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11. A biography of this person by Alexis Coe dismisses this person's previous male biographers as the "Thigh Men of Dad History." Early biographers of this person gained access to his papers from his nephew Bushrod. This person sits in a purple robe between Liberty and Victory in a Constantino Brumidi painting titled for his (\*) "apotheosis" ("uh-paw-thee-OH-siss"). This person was ranked above John Pershing in legislation that gave him the posthumous title "General of the Armies." Parson Weems wrote many legends about this man, including one in which he admits that he chopped down a cherry tree. For 10 points, name this first president of the United States.

ANSWER: George **Washington**

<Other — McAvoy-Bickford> [Edited]

11. This empire started making regular expeditions into the Indian Ocean after its conquest of the Egyptian Mamluk Sultanate in 1517. For 10 points each:

[E] Name this empire, which regulated the spice trade between Asia and Europe during the late 15th century. Its Sultan Suleiman the Magnificent greatly expanded its navy, although it lost the Battle of Lepanto in 1571.

ANSWER: **Ottoman** Empire [Accept the **Turkish** Empire]

[M] This other empire contested Ottoman dominance of Indian Ocean trade by supporting Ethiopia and Hormuz in wars against the Ottomans. This empire also controlled Malacca and Diu.

ANSWER: **Portugal** [or the **Portuguese Empire**]

[H] In 1535, the Portugese Duke of Beja ("BAY-jah") joined the Spanish Habsburgs in besieging this Ottoman port city in the Mediterranean. One year earlier, Hayreddin Barbarossa had captured this capital of the Hafsid dynasty for the Ottomans.

ANSWER: **Tunis**

<World History — Rollin> [Ed. Laurence Li]

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12. One work by this thinker advocates to "Let the Turk believe and live as he will" and is titled *On War Against the Turk*. In another work, this thinker argued that Christians are not compelled to keep God's law to obtain salvation. This thinker advocated forbidding rabbis from preaching in his anti-judaic tract (\*) *On the Jews and Their Lies*. Earlier, this thinker penned 12 Articles in response to the German Peasants Revolt. The bull *Exsurge Domine* was issued by Pope Leo X ("the tenth") against this thinker after the Diet of Worms ("vurmz"), which was called after he nailed a work criticizing indulgences on the door of the church of Wittenberg ("VIT-en-berg"). For 10 points, name this religious reformer who wrote the 95 Theses.

ANSWER: Martin **Luther**

<European History — Felix Wang> [Ed. Iyer]

12. Long stretches of DNA can be quickly sequenced using a technique named for the “walking” of these short sequences. For 10 points each:

[M] Name these short nucleotide sequences that, in PCR (“P-C-R”), bind to the 3-prime end of the DNA sequence being amplified. DNA polymerase must attach to one of these sequences before it can begin replication.

ANSWER: **primers** [accept **primer** walking or DNA **primers**; accept, but do NOT reveal RNA **primers**]

[E] Though PCR uses a primer made of DNA, living cells use primers made of this other nucleic acid during DNA replication. Information from DNA is copied onto the “messenger” variety of this compound during transcription.

ANSWER: **RNA** [or **ribonucleic acid**; accept **mRNA** or messenger **RNA**]

[H] In this technique, gel electrophoresis separates RNA fragments that are then transferred to a nylon membrane, where labelled probes bind to the target RNA sequence. Gene expression is often quantified using this technique.

ANSWER: **northern blot** [or **northern blotting**; prompt on **RNA blotting**; do NOT accept or prompt on “northwestern blot”]

<Biology — Athreya> [Ed. Yin]

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13. **One film by this director references the Bible verse Jeremiah 11:11 on the sign of a homeless man on a boardwalk. That film by this director begins with a shot of a grid of caged rabbits that are eaten for sustenance. In another film by this director, a woman creepily drinks milk separately from her Froot Loops while scrolling through a list of NCAA (“N-C-double-A) athletes. In that film, the clink of a (\*) teacup causes a character to remember a traumatic memory, sending him to the Sunken Place. In that film by this director, the Armitage family attempts to transplant a white client’s brain into the body of Chris because “black is in fashion.”** For 10 points, name this director of *Us* and *Get Out*.

ANSWER: Jordan **Peele**

<Film — Felix Wang> [Ed. Bowman]

13. Isabelle Faust, Alexander Melnikov, and Jean-Guihen Queyras recorded this composer’s only three concerti with the Freiburger Barockorchester. For 10 points each:

[M] Name this composer whose Piano Concerto was premiered by his wife in Leipzig. That Piano Concerto in A minor inspired a similar piece by Edvard Grieg.

ANSWER: Robert **Schumann** [do NOT accept or prompt on “Clara Schumann”]

[H] Schumann’s other A minor Concerto is for this instrument and opens with three soft chords in the winds with pizzicato strings. Franz Joseph Haydn’s two concertos for this instrument are in D and C major.

ANSWER: **cello** [or **violoncello**]

[E] The finale of Schumann’s Violin Concerto is in the rhythm of a dance from this country. Schumann exclaimed, “Hats off, gentlemen! A genius!” in praise of a composer from this country, Frederic Chopin.

ANSWER: **Poland** [accept **polonaise**]

<Classical Music — Gurazada> [Edited]

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14. **A poem by this author describes the title figures as “Naked and bald in their furs” and ends with the declaration, “The snow has no voice.” Another poem by this author calls the title animal “God's lioness” and describes the “red / Eye, the cauldron of morning.” The speaker of a poem by this author claims that “like the cat I have nine times to die” and says, “I rise with my red hair / And I (\*) eat men like air.”** This writer described a “vampire who... drank my blood for a year” in a poem about a “man in black with a Meinkampf look.” For 10 points, name this Confessional poet of “Lady Lazarus” and “Daddy,” who died by suicide in 1963.

ANSWER: Sylvia **Plath**

<Poetry — Kim> [Ed. Condrón, Mayers]

14. This character frowns in a “spasm of angry disgust” after seeing a Russian family on the beach. For 10 points each:

[H] Name this character who is called “a tender young god, emerging from the depths of sea and sky” by a biographer of Frederick the Great. That man dies after watching this character wrestle with Jaschui on the beach.

ANSWER: **Tadzio** (“TADZ-yoo”) [accept **Tadeusz**]

[M] This novella describes how Gustav von Aschenbach stalks the Polish boy Tadzio. Gustav becomes increasingly concerned with his physical appearance throughout this novella before dying amid a cholera outbreak.

ANSWER: ***Death in Venice*** [or *Der Tod in Venedig*]

[E] Thomas Mann, an author from this country, wrote the novella *Death in Venice*. Thomas Mann wrote about Goethe (“GUR-tuh”), another author from this country, in his novel *Lotte in Weimar*.

ANSWER: **Germany** [or Federal Republic of **Germany** or *Bundesrepublik Deutschland*]

<Long Fiction — Orr> [Ed. Condon]

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15. This thinker believed that punishment was the result of an unscientific analysis of individuals in a book that calls cultural evolution “a gigantic effort in self-control.” This thinker’s student Kenneth MacCorquodale defended a book by him that proposed a consequence-reinforced speech operant known as “mand.” This thinker argued that “autonomous man” hinders the development of a better society in the book (\*) *Beyond Freedom and Dignity*. This psychologist designed a chamber that fed pigeons food after they pushed a button in order to test animal reinforcement. For 10 points, name this psychologist and author of *Verbal Behavior* who created a namesake box for operant conditioning.

ANSWER: Burrhus Frederic **Skinner** [or B.F. **Skinner**]

<Psychology — Felix Wang> [Ed. Ashbrook]

15. A pentavalent dopant is used to increase the concentration of electrons within n-type examples of these materials. For 10 points each:

[E] Name these materials, such as silicon and gallium arsenide, which have conductivity between that of a conductor and an insulator.

ANSWER: **semiconductors**

[M] In n-type semiconductors, the concentration of electrons is greater than the concentration of these quasiparticles. These quasiparticles are the locations where an electron could exist but does not, leaving a net positive charge.

ANSWER: electron **holes**

[H] Electrons and holes are both classified as this general type of particle. In semiconductor physics, this type of particle includes any particle that can transport charge.

ANSWER: charge **carrier** [or current **carrier**]

<Physics — Bowman> [Ed. French]

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16. This emperor claimed that he would employ the conspirator Casperius Aelianus (“ay-lee-AN-us”) before he “put him out of the way.” This emperor’s consul Lusius Quietus suppressed the Kitos (“kee-TOS”) War, before which this emperor led the conquest of Mesopotamia. A bridge named for this emperor designed by Apollodorus of Damascus was the longest arch bridge in the world. This emperor led forces that destroyed Sarmizegetusa, after which his opponent (\*) Decebalus committed suicide. This ruler’s namesake column in the Forum depicts his victories in the Dacian Wars. For 10 points, name this emperor who expanded Rome to its greatest extent and was succeeded by Hadrian.

ANSWER: **Trajan** [or Marcus Ulpius **Traianus**]

<European History — McAvoy-Bickford> [Ed. Iyer]



16. During a May 1992 television appearance, this man asked “can we all just get along?” For 10 points each:  
[M] Name this motorist who was beaten on the Foothill freeway in March of 1991. The acquittal of four police officers who were recorded beating this man on video catalyzed riots in one city in 1992.

ANSWER: Rodney **King**

[E] The Rodney King riots erupted in this largest southern California city, where Latasha Harlins was shot by a Korean convenience store owner. Rioting also engulfed the cities of Inglewood and Compton near this city.

ANSWER: **Los Angeles** [or **LA**]

[H] This first African-American mayor of LA retired after his approval ratings plummeted following the riots. This mayor’s earlier loss in the 1982 California gubernatorial election inspired the name of an effect in which voters don’t reveal their preference for a white candidate.

ANSWER: Thomas **Bradley** [or Tom **Bradley**; accept **Bradley** effect]

<U.S. History — Athreya> [Ed. Iyer, Laurence Li]

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17. **Conditions in which one of these objects can be embedded on a surface of genus  $g$  are given by the Robertson-Seymour theorem. That theorem extends Wagner’s theorem on these objects, since it classifies them by their forbidden minors. If one of these objects does not have  $K_5$  (“K sub five”) or  $K_{3,3}$  (“K sub three-three”) as a minor, then it is (\*) planar. An NP-complete problem asks whether one of these objects has a Hamiltonian cycle. Connected, acyclic examples of these objects are trees. These objects have a set of vertices which are connected by a set of edges. For 10 points, name these mathematical objects whose theory Euler developed to solve the Konigsberg bridge problem.**

ANSWER: **graphs** [accept **graph** theory; do NOT accept or prompt on “trees”]

<Math — French> [Edited]

17. A translator claimed that the phrase “was broken,” which begins “The Battle of Maldon,” could serve as a condensed history of the poetry written in this language. For 10 points each:

[H] Name this language used to write “The Seafarer,” whose opening Ezra Pound translated as “May I for my own self song’s truth reckon.”

ANSWER: **Old English** [or **Anglo-Saxon**; do NOT accept or prompt on “English” or “Middle English” or “Modern English”]

[E] The title character of this Old English epic poem contained in the Nowell Codex decapitates Grendel’s mother after defending the mead hall of Heorot.

ANSWER: **Beowulf**

[M] This author translated the interjection “hwæt” (“h’wat”) as “so” in his 1999 translation of *Beowulf*. He also wrote *Death of a Naturalist*.

ANSWER: Seamus **Heaney**

<Poetry — Condron> [Edited]

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18. **A speech in this play describes a concept that is “mightiest in the mightiest” and that “blesseth him that gives and him that takes.” A character in this play is warned, “That in the course of justice none of us / Should see salvation,” by a character who compares mercy to “gentle rain from heaven” while disguised as (\*) Balthazar. A character in this play asks, “If you tickle us, do we not laugh?” and “If you prick us, do we not bleed?” in a speech that asks, “Hath not a Jew eyes?” That character in this play demands a pound of flesh as collateral for a loan. For 10 points, name this Shakespeare play in which the Jewish moneylender Shylock gives a loan to Antonio.**

ANSWER: *The **Merchant of Venice***

<Drama — Louis Li> [Ed. Condron, Mayers]

18. Some stars can briefly outshine their parent galaxies when they undergo large outbursts of this process known as helium flashes. For 10 points each:

[E] Name this process in which low-mass atomic nuclei combine to form heavier nuclei.

ANSWER: nuclear **fusion** [accept **triple-alpha** process]

[M] Helium flashes occur in these stars, which Sun-like stars turn into after they exhaust all the hydrogen in their cores. These stars eventually eject their outer layers in a planetary nebula before leaving behind a white dwarf.

ANSWER: **red giants** [or **red giant** stars; prompt on **giant**; do NOT accept or prompt on “red supergiant”]

[H] Red giants enter this branch on an H-R diagram after they exhaust all the helium in their cores. Mira variables are located on this branch, whose members possess circumstellar envelopes due to their strong stellar winds.

ANSWER: **asymptotic giant** branch [or **AGB**; do not accept or prompt on “red giant branch” or “RGB”]

<Astronomy — Yin> [Edited]

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19. **The four-vector of this quantity is the unit tangent vector of the worldline. The magnitude of this quantity is proportional to the hyperbolic tangent of rapidity. In special relativity, a factor of one plus a dot product appears in the denominator of the Einstein formula for the addition of this quantity. A Lorentz (\*) boost transforms between frames with different values of this quantity. In natural units, the Lorentz factor gamma equals “one over the square root of one minus this quantity squared.” This quantity is constant for an inertial frame. For 10 points, relativistic effects become relevant when the magnitude of what quantity is close to the speed of light?**

ANSWER: **velocity** [accept relativistic **beta**; accept **speed** before “speed of light”; prompt on **v** or **v over c**; do NOT accept or prompt on “speed of light”]

<Physics — French> [Edited]

19. In “The Dialogue of Late Afternoon,” Nadine Gordimer describes how the “stimulus” of this author comes from “the conflict of responses he elicits.” For 10 points each:

[M] Name this author whose native country banned his novel *The Children of Gebelawi* for including characters which represent God and the prophets. *Palace Walk* is the first novel in a trilogy by this author.

ANSWER: Naguib **Mahfouz**

[H] In this novel by Mahfouz, Said Mahran becomes enraged with his wife Nabawiyya, who marries another man while Said was in prison. In this novel, Sheikh Ali shelters Said after he murders a man who he believes is his former mentor Rauf Ilwan.

ANSWER: *The **Thief and the Dogs***

[E] Naguib Mahfouz wrote *The Cairo Trilogy* in this language. In *The Thief and the Dogs*, Said hears the Muslim call to prayer announced in this language, which was also used to write the Quran.

ANSWER: **Arabic** [or *al-**arabiyyah***]

<Condron> [Edited]

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20. **If built, this country’s Grand Inga Dam would be the most productive power plant in the world. The longest headstream of this country’s main river is fed from Lake Mweru, on its eastern border, and the largest, the Lualaba, once was explored by a man who also named this country’s Malebo Pool. The “Lower” stretch of this country’s main river is impassable between its capital and city of (\*) Matadi, and its city of Boma lies at that river’s mouth. Henry Morton Stanley explored this country’s namesake river, which is the setting of *Heart of Darkness* and the longest river in Central Africa. For 10 points, name this country, formerly called Zaire, with capital Kinshasa.**

ANSWER: **Democratic Republic of the Congo** [or **DRC**; prompt on **Congo**; do NOT accept or prompt on “Republic of the Congo”]

<Geography — Daniel Ma> [Edited]

20. An author described exchanging bread with the “hungry little urchins” who helped him with this task, but intentionally withholds the names of those boys out of fear of embarrassing them. For 10 point each:

[H] Name this task compared to receiving “bread of knowledge” by an author who described how doing this action led him to “abhor and detest” his enslavers even more.

ANSWER: **reading** [or learning how to **read**; prompt on **literacy**]

[E] This author and abolitionist described learning how to read in an 1845 memoir titled for the *Narrative* of his life. This author’s autobiography describes how he fought back against the “negro-breaker” Mr. Covey after enduring relentless abuse.

ANSWER: Frederick **Douglass**

[M] In a speech titled “What to the Slave is [this holiday],” Frederick Douglass claimed that for a slave, this holiday reveals “the gross injustice and cruelty to which he is the constant victim.”

ANSWER: **4th of July** [or **July Fourth** or **Independence Day**; accept “What to the Slave is the **Fourth of July**”]

<Other Literature — Condron> [Edited]