

Round 6

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Tossups

(1) **Plants lack an immune system, but can use the super-ion of this element to attack pathogens. Heating the compound red mercury allowed Joseph Priestly to liberate this element, whose namesake type of reaction involves loss of (*) electrons.** The triatomic form of this element is called ozone, and its more common diatomic gas is needed to generate a candle flame. For ten points, name this element, a vital gas that is inhaled during respiration.

ANSWER: oxygen (accept O)

(2) **After this disaster, Louis Sullivan designed the Auditorium Building in the affected city. The Palmer House was destroyed in this event, but the Water Tower was spared. This disaster, which was less deadly than a simultaneous event in Peshtigo, (*) Wisconsin, began on De Koven Street after Catherine O’Leary’s cow supposedly kicked over a lantern.** For ten points, name this 1871 disaster that devastated a mostly-wooden Illinois city.

ANSWER: Great Chicago Fire of 1871 (prompt on “fire”)

(3) **In a novel by this author, Arronax, Conseil, and Ned Land flee the Maelstrom, which threatens to sink a strange vessel. In another of this man’s novels, Aouda is saved from being burned alive by (*) Passepartout and a man who later uses the international dateline to win a bet. Phileas Fogg and Captain Nemo’s submarine, the *Nautilus*, appear in, for ten points, what French author’s novels *Around the World in Eighty Days* and *Twenty Thousand Leagues Under the Sea*?**

ANSWER: Jules Verne (accept Jules Gabriel Verne)

(4) **Only this type of number is allowed as the solution to a Diophantine [dye-oh-FAN-teen] equation. The set of these numbers is not closed under exponentiation due to some results involving negative exponents, and they are the subject of the fundamental theorem of arithmetic. A boldface letter (*) Z stands for the set of these numbers, which includes the natural numbers. For ten points, negative two is, but three-fourths is not what type of number that has no fractional part?**

ANSWER: integers (prompt on “whole numbers”; do not prompt on natural numbers)

(5) **Like Anubis, this god was syncretized with Khenti-Amentiu, the Foremost of the Westerners, and with Wepwawet, the Opener of the Ways who was usually described as the son of this god’s sister Nephthys. The djed column was the symbolic backbone of this god, who was (*) cut into fourteen pieces by Set, this god’s brother. This god appears with green skin as a result of his death and resurrection. For ten points, name this Egyptian god of the dead, the father of Horus and husband of Isis.**

ANSWER: Osiris (accept Asar or Usire)

(6) **The zero-to-eleven TORRO scale measures the intensity of these events and is primarily used in the United Kingdom, where roughly thirty of them take place each year. In the US, the damage caused by these events is used to rank them on an “Enhanced” scale, named for Ted (*) Fujita, that tops out at F5. A “freight train” noise commonly accompanies, for ten points, what natural disasters that can include three hundred mile-per-hour winds and a rotating funnel cloud of debris?**

ANSWER: tornado (prompt on “twister” or other colloquial names; do not prompt on cyclone)

(7) **This opera’s heroine sings “Tra la la” after she is arrested for trying to stab another woman. The title character of this opera declares that “Love is a rebellious bird” in a famous aria known as the (*) Habanera. This opera, which is performed in French despite being set in Spain, also contains the “Toreador Song.” Don José and the bullfighter Escamillo vie for the title character’s love in, for ten points, what Georges Bizet opera about a passionate Roma woman?**

ANSWER: Carmen

(8) **This country was home to the legendary seventeenth century pirate colony of Libertatia, whose residents developed a new language that incorporated parts of Malagasy, a native language. The French overseas region of Mayotte and the island country of Comoros are found in the (*) Mozambique Channel, which separates this country from the mainland. Antananarivo is the capital of, for ten points, what large island country off the southeast coast of Africa?**

ANSWER: Republic of Madagascar

(9) **A character in this novel uses the pseudonyms “Provis” and “Mr Campbell” upon returning to England from Australia, and he fights Compeyson, his partner in crime, in the River Thames. Anger over being jilted drives Miss (*) Havisham to stop the clocks in Satis House and raise Estella to be a heartbreaker in this novel. Estella’s criminal father, Abel Magwitch, becomes the benefactor of Pip in, for ten points, what novel by Charles Dickens?**

ANSWER: Great Expectations

(10) **In 2014, protesters in this country stormed Independence Square after negotiations to form ties with the EU were halted. This country’s 2004 Orange Revolution occurred after Viktor Yanukovich was accused of voter fraud. Most countries do not recognize the controversial (*) annexation of this country’s Crimean Peninsula. The Chernobyl disaster took place in, for ten points, what Eastern European country where the Euromaidan protests against Russia took place in the capital, Kiev?**

ANSWER: Ukraine

(11) **In *Hazelwood v. Kuhlmeier*, the Supreme Court ruled that this right did not necessarily extend to public schools. In one of the first American court cases involving this right, Peter Zenger’s company was found not to have committed (*) libel against a New York governor. This right is protected, along with speech, assembly, religion, and petition, by the Constitution. For ten points, name this First Amendment right that protects against censorship of journalists.**

ANSWER: freedom of the press (accept equivalents that describe freedom of journalism; prompt on partial answers; prompt on “First Amendment” before it is read; do not accept or prompt on “free speech”)

(12) **This event began with Richie Havens, who played for over two hours and gave several encores as a stalling tactic while organizers waited for other performers to arrive. Max Yasgur's dairy (*) farm near White Lake was the site of this event, whose performers included Creedence Clearwater Revival, Jefferson Airplane, and Jimi Hendrix. For ten points, name this 1969 music festival in upstate New York, often hailed as the high point of the hippie movement.**

ANSWER: Woodstock Music Festival (accept Aquarian Music Festival; accept Bethel Rock Festival)

(13) **This artist created a *Lobster Telephone* and made the film *An Andalusian Dog* with Luis Buñuel. This artist painted a *Disintegration* of one of his paintings, in which a bare tree trunk separates into segments. (*) Ants crawl on the surface of a red object in a painting by this artist set on a Catalonian beach, in which a distorted face with long eyelashes is draped with a soft-textured clock. For ten points, name this Spanish Surrealist artist of *The Persistence of Memory*.**

ANSWER: Salvador Dalí (accept Salvador Domingo Felipe Jacinto Dalí i Domènech, Marquis de Púbol)

(14) **This fictional book notes that “you may think it’s a long walk [...] to the chemist, but that’s just peanuts to space” and says “forget it” to those considering getting a lift from a Vogon. An entry in this book lists Earth as “mostly harmless” despite the objections of field researcher (*) Ford Prefect, who uses this book to advise Arthur Dent that he should always carry a towel when traveling. For ten points, name this fictional book that provides information about the known galaxy in a namesake series of novels by Douglas Adams.**

ANSWER: The Hitchhiker’s Guide to the Galaxy (accept H2G2)

(15) **The angular analogue of this quantity is equal to net torque divided by moment of inertia. In uniform circular motion, a centripetal force creates this quantity, which points radially inward and is equal to velocity squared divided by radius. This quantity, the derivative of velocity, is multiplied by (*) mass to give force in Newton’s Second Law. For ten points, name this quantity that is non-zero if an object is changing direction, slowing down, or speeding up.**

ANSWER: acceleration (accept linear acceleration; accept angular acceleration; prompt on “a”)

(16) **This philosophical concept is defined by the stronger party, according to Thrasymachus [thra-sih-mah-kus] in Plato’s *Republic*. The “difference principle” is outlined in *A Theory of* [this concept], a 1971 book by John Rawls that describes a “veil of ignorance” required to make sure that this concept is applied (*) fairly. A blindfolded woman holding balancing scales often represents, for ten points, what moral and ethical concept related to equality and the law?**

ANSWER: justice (accept word forms like just; accept *A Theory of* Justice)

(17) **In early Christian teachings, this man was the first to plant a vineyard. In Islamic tradition, one of this man’s sons died when he climbed a mountain instead of joining this man. This son of Lamech cursed his grandson (*) Canaan for the sins of Ham, and repeatedly released a dove to determine whether there was dry land nearby. A covenant from God in the form of a rainbow was received by, for ten points, what prophet who built an ark to save his family from a great flood?**

ANSWER: Noah (accept Nuh)

(18) **Margaret Bourke-White photographed this man at the Birla House sitting behind a spinning wheel. This man, who agreed to a 1931 pact with Lord Irwin in advance of the Second Round Table Conference, was assassinated by (*) Nathuram Godse, who believed this man had given too much power to Muslims during the partition of the British Raj. A nonviolent 1930 salt march was led by, for ten points, what independence leader who advocated for civil disobedience in India?**

ANSWER: Mahatma Gandhi (accept Mohandas Karamchand Gandhi)

(19) **This author acted as an “assistant researchist” for the book *In Cold Blood*, which this author worked on with Truman Capote, a friend who inspired this author’s character Charles Baker Harris. This author wrote about a woman returning to her childhood home in (*) Maycomb, Alabama in *Go Set a Watchman*, and about Jem, Scout, and their father, Atticus Finch, in her first novel. For ten points, name this American author of *To Kill a Mockingbird*.**

ANSWER: Harper Lee (accept Nelle Harper Lee)

(20) **In dry areas, this process can be aided by crassulacean [cra-soo-lay-shun] acid metabolism. The enzyme RuBisCo catalyzes a portion of this process. During this process, ATP and NADPH convert carbon dioxide into glucose as part of the (*) Calvin cycle. This process takes place inside thylakoids, a membrane-bound component of chloroplasts. Chlorophyll is vital to, for ten points, what process in which plants transform light into energy?**

ANSWER: photosynthesis (accept CAM photosynthesis; prompt on “(C₄) carbon fixation;” prompt on “light-independent reactions”)

Bonuses

(1) In a poem about this war, titled “Counter-Attack,” Siegfried Sassoon wrote about “Lewis guns well placed / and clink of shovels deepening the shallow trench.” For ten points each,

Name this “War to End All Wars” that ravaged Europe in the early twentieth century.

ANSWER: World War I (accept First World War; prompt on “Great War”)

Siegfried Sassoon was a friend and mentor of Wilfred Owen, the author of this poem that begins “War broke.” This poem describes a “foul tornado, centered at Berlin,” and is titled for the first year of World War I.

ANSWER: 1914

John McCrae’s poem “In Flanders Fields” popularized the use of this flower in “remembrance” of the war. These flowers, which “blow / between the crosses, row on row” in the poem, are still worn to commemorate fallen British commonwealth soldiers.

ANSWER: remembrance poppy (or poppies)

(2) After being accused of being unfaithful to her husband, a character in this work successfully walks into fire to prove her innocence. For ten points each,

Name this ancient Sanskrit epic that focuses on the title prince rescuing his wife Sita from Ravana.

ANSWER: Ramayana

Prince Rama is the seventh avatar of this Hindu preserver god. This god forms the Trimurti [tree-moor-tee] with Brahma and Shiva.

ANSWER: Vishnu

Rama is helped in his attempt to rescue Sita by Hanuman, one of these animals, who uses his tail to set fire to Ravana’s palace. In illustrations of the Ramayana, Hanuman is often modeled after a Rhesus one of these animals.

ANSWER: monkeys (do not accept “apes”)

(3) Name the following actors who have portrayed Sherlock Holmes, for ten points each.

This comic actor played Holmes, opposite John C. Reilly’s Watson, in the truly awful 2018 film *Holmes and Watson*. He was nominated for the Golden Raspberry Award for Worst Actor, but lost to Donald Trump.

ANSWER: Will Ferrell (accept John William Ferrell)

This English actor played a retired Holmes in 2015’s *Mr. Holmes* and played Gandalf in Peter Jackson’s *Lord of the Rings* trilogy.

ANSWER: Ian McKellen (accept Sir Ian Murray McKellen)

This actor starred in the 2009 film *Sherlock Holmes* and its 2011 sequel, *Sherlock Holmes: A Game of Shadows*. Having finished his Marvel commitments as Tony Stark, it is reported that this man will star in a 2021 Holmes film.

ANSWER: Robert Downey Jr. (accept Robert John Downey Jr.)

(4) This artist turned her attention to exposing social injustice after taking her camera down to the street near her New York apartment and photographing a bread line on a whim. For ten points each,

Name this American photographer who created *One Nation, Indivisible* and *Migrant Mother*.

ANSWER: Dorothea Lange (accept Dorothea Margareta Nutzhorn; accept Dorothea Margareta Taylor)

Dorothea Lange's photograph *Migrant Mother* showcases the struggles of working-class Americans during this historical period. Lange's picture *A Sign of the Times* shows the heavily-mended stockings of a stenographer who couldn't afford new clothes during this extreme economic downturn.

ANSWER: Great Depression (accept Dust Bowl; prompt on "1930s" or "the thirties")

Lange's *One Nation, Indivisible*, which shows schoolchildren reciting the Pledge of Allegiance, protested the forced relocation of American citizens to these institutions in the 1940s. Many of Lange's photographs were taken at Manzanar, one of these institutions created to house Americans of Japanese descent in California.

ANSWER: concentration camps (accept Japanese internment camps; prompt on "camp")

(5) Bardeen, Brattain, and Shockley invented the first one of these devices at Bell Labs in 1947. Soon afterward, these devices replaced the vacuum tube as switches in electronic computers. For ten points each,

Name this electronic circuit component that modifies a signal, either by switching it or amplifying it.

ANSWER: transistors

Transistors are made out of this type of material, which have resistivity between that of a conductor and an insulator. Germanium and some other metalloids are common examples of this type of material.

ANSWER: semiconductors

Most transistors are made of this element with symbol Si [spell it]. A region of northern California became known as this element's "Valley" after the tech industry boomed there in the twentieth century.

ANSWER: silicon (accept Silicon Valley; do not accept "silica" or "silicone")

(6) In this novel, Justine Moritz is framed for the murder of William, and the title character's wife, Elizabeth, is murdered on her wedding night. For ten points each,

Name this Gothic novel, considered by some to be the first science fiction novel, in which the title scientist's life is destroyed by his monstrous creation.

ANSWER: Frankenstein; or, The Modern Prometheus

Frankenstein is by this English author of *Valperga*.

ANSWER: Mary Shelley (accept Mary Wollstonecraft Shelley)

The frame story of *Frankenstein* consists of letters written by this man to his sister, Margaret. On a journey to the North Pole, this man finds Victor Frankenstein, who recounts his story to this captain.

ANSWER: Captain Robert Walton (accept either underlined name)

(7) Participants in this event included Thomas Winter, Thomas Percy, and their leader, Robert Catesby. For ten points each,

Name this 1605 attempt to assassinate King James I and replace England's Protestant government with a Catholic one. It failed when its namesake explosive substance was discovered and confiscated.

ANSWER: Gunpowder Plot (accept Gunpowder Treason; accept Jesuit Treason)

British citizens remember the Gunpowder Plot by celebrating Bonfire Night on the fifth of November, in which effigies of this man, who is traditionally depicted with a smiling mask, are burned.

ANSWER: Guy Fawkes (accept Guido Fawkes)

Robert Catesby and Guy Fawkes attempted to overthrow King James I by blowing up this building, which is home to the House of Lords and the House of Commons.

ANSWER: Houses of Parliament (accept Palace of Westminster)

(8) Thetis requests that Hephaestus craft this object and a set of armor for her son, Achilles, in Book 18 of an epic poem. For ten points each,

Name this piece of circular protective equipment whose ornate decorations are described by Homer in several stanzas of epic poetry.

ANSWER: shield of Achilles

Homer's description of the shield of Achilles is one of several interludes between battles in this epic poem about the Trojan War. This work's action takes place before Homer's *Odyssey*.

ANSWER: Iliad

Achilles uses his new shield and armor in battle against this Trojan warrior, whom he chases around the walls of the city before finally killing him. The *Iliad* ends with Achilles returning this man's body to his father, Priam.

ANSWER: Hector

(9) This event was nearly doomed prematurely when the patrol *Nitto Maru* spotted the task force, causing this event's participants to be launched from the *Hornet* ten hours earlier than planned. For ten points each,

Name this April 18, 1942 mission in which sixteen modified B-25 bombers took off from an aircraft carrier and attacked Tokyo and other cities. This mission was an important early motivational victory for the US in World War II.

ANSWER: Doolittle raid(s) (accept descriptive answers of James Doolittle's air raid on Tokyo)

The Doolittle raids served as revenge for Japan's surprise attack on this Hawaiian naval base on December 7th, 1941.

ANSWER: Pearl Harbor

It was impossible for the planes to land on an aircraft carrier and most didn't have enough fuel to reach safe landing spots, so all but one bomber had to safely crash. The only plane that was able to land did so near Vladivostok in this country.

ANSWER: Soviet Union (accept USSR; accept the Union of Soviet Socialist Republics; accept Russia)

(10) Research from 2018 indicates there is a contiguous, fluid-filled space between the skin and digestive tract called the interstitium [inter-stih-shum]. For ten points each,

Much of the solid tissue in the interstitium is composed of this strong connective material found in tendons and ligaments. This protein is the most common one found in mammals.

ANSWER: collagen

The interstitial fluid drains into this system, whose namesake nodes in the neck become swollen during infection.

ANSWER: lymphatic system (accept lymph nodes)

The presence of interstitial fluid throughout the body helps explain the rapid spreading of this type of illness, especially types beginning in the pancreas or breast.

ANSWER: cancer (accept carcinoma; accept cancerous tumors)

(11) This term was likely coined by Gertrude Stein, who supposedly heard a mechanic use it as an insult while she was living in France after World War I. For ten points each,

Give this term, which describes both the unimaginable quantity of death among people who came of age during World War I and the aimlessness of the young American expatriates who moved to Paris after the war.

ANSWER: the Lost Generation (accept génération perdue)

This friend of Gertrude Stein popularized the term “Lost Generation” in a novel about Jake Barnes and Lady Brett Ashley. This American author also wrote *For Whom the Bell Tolls*, *A Farewell to Arms*, and *The Old Man and the Sea*.

ANSWER: Ernest Hemingway (accept Ernest Miller Hemingway)

Hemingway popularized the term in this novel, in which the wounded soldier Jake Barnes, the frequently-married Lady Brett Ashley, and their Lost Generation friends travel from Paris to Pamplona to watch bullfighting.

ANSWER: The Sun Also Rises

(12) General Zaragoza commanded the main forces of one side at this battle, which was triggered by Benito Juárez’s suspension of foreign debts. For ten points each,

Name this 1862 battle, a key victory against French forces that delayed France’s installation of an emperor. This battle is commemorated annually in Mexico.

ANSWER: Battle of Puebla

The Battle of Puebla is celebrated each year on this day, the anniversary of the battle. In non-Mexican communities, this holiday is often confused for Mexican Independence Day, which is actually in September.

ANSWER: Cinco de Mayo (accept May 5)

This man, an eleven-term president and general who ordered the mass executions at Goliad and the Alamo, wasn’t present at Puebla, since he had been exiled from Mexico in the 1854 Plan of Ayutla.

ANSWER: Antonio López de Santa Anna (accept Antonio de Padua Maria Severino López de Santa Anna y Pérez de Lebrón)

(13) These features generally form after impact from objects that are traveling at very high speeds because slower collisions won't generate the necessary high-energy explosion. For ten points each,

Give this term for the depression left behind by an impact from a cosmic body, like a meteor or asteroid.

ANSWER: impact **craters**

This second-largest moon of Jupiter, smaller only than Ganymede, is the most heavily-cratered moon in our Solar System.

ANSWER: **Callisto**

Compared to moons like Callisto and Ganymede, Earth seemingly lacks the same history of crater-forming impacts. This may be partly because Earth's atmosphere slows down smaller rocks, and partly because of this general process, in which wind, flowing water, or other natural actions smooth out the crater.

ANSWER: **erosion** (accept word forms like **erode**)

(14) The 2019 Netflix documentary *Knock Down the House* followed the primary campaigns of four progressive women who ran for Congress in 2018. For ten points each,

The film observes the massive electoral upset won by this woman, the leading advocate for the Green New Deal, who became the youngest woman to serve in Congress in 2019.

ANSWER: Alexandria **Ocasio-Cortez** (prompt on partial last names; prompt on "AOC")

In the House, Ocasio-Cortez represents this state's fourteenth district, which includes portions of Queens and the Bronx.

ANSWER: **New York**

Like Ocasio-Cortez and Michigan's Rashida Tlaib, this state's representative Ilhan Omar has been attacked as "un-American" by some Republicans. This state elected the first Muslim Congressman, Keith Ellison, in 2007.

ANSWER: **Minnesota**

(15) Arthur Rubinstein made his career on interpretations of this man's pieces. For ten points each,

Name this early nineteenth century composer of piano works like the "Minute Waltz" and the *Fantaisie-Improptu*.

ANSWER: Frédéric **Chopin** (accept Frédéric François **Chopin**; accept Fryderyk Franciszek **Szopen**)

Although he lived and worked in Paris for much of his life, Chopin championed the music of this country, where he was born in Warsaw. Dancing music from this country includes styles like the mazurka.

ANSWER: **Poland**

Chopin composed two sets of these compositions, some of which are nicknamed "Tristesse" and "Revolutionary." These compositions are intended as practice material to help pianists work on their musical skill.

ANSWER: **études**

(16) The crystallization of this kind of solution allows chemical hand warmers to become hot instantly. For ten points each,

Give this term for a solution that contains more solute than should be possible. Decreases in temperature can cause a solution to enter this state.

ANSWER: supersaturated (do not prompt on “saturated”)

Changes in temperature, volume, or this quantity, measured in pascals or PSI, can cause a solution to become supersaturated. This quantity is the force applied to an object over the area in which it is applied.

ANSWER: pressure

Preparation of any solution requires a solute, the chemical that gets dissolved, and this component, which does the dissolving.

ANSWER: solvent

(17) Let’s talk about the residents of the Greek underworld, for ten points each.

Ancient Greeks put coins in the mouths of the dead to pay this mythical figure, who ferried the souls of the dead across the river Acheron or the river Styx.

ANSWER: Charon

After this goddess was abducted by Hades, the nymph Cyane wept so much that she turned into a puddle. This goddess was forced to spend part of each year in the underworld after eating pomegranate seeds.

ANSWER: Persephone

Alongside Minos and Aeacus [ee-ah-kuss], this son of Zeus and Europa served as one of the judges of the underworld.

ANSWER: Rhadamanthys

(18) This county is often treated as a city, because it encompasses less than twenty-six square miles of land area. For ten points each,

Name this county whose neighborhood of Crystal City was chosen in 2018 as one of two locations for Amazon’s second headquarters. Other massive office complexes in this county include the Pentagon, which is found near a famous national cemetery.

ANSWER: Arlington County (accept Arlington National Cemetery)

Arlington County is the sixth-most populous county in this US state. Many of its residents work in Washington, DC, which was formed by land taken from this state and Maryland.

ANSWER: Virginia

Arlington County is separated from Washington, DC by this river, which receives the Anacostia River before flowing to Chesapeake Bay.

ANSWER: Potomac River

(19) The Argand diagram plots these numbers in a familiar Cartesian-style coordinate system by replacing the x and y axes with the two component parts of these numbers. For ten points each,

Name this type of number that has both real and imaginary parts.

ANSWER: **complex** numbers

Complex numbers incorporate the imaginary numbers, whose basic unit is equal to the square root of negative one and is traditionally represented by this letter.

ANSWER: **i**

In 1843, William Hamilton developed the quaternions, a number system with three basic units: i , j , and k . Multiplication within the quaternions lacks this property, as seen by the fact that i times j equals k , but j times i doesn't equal k ; it equals negative k instead.

ANSWER: **commutativity** (accept word forms, like **commutative**; accept **anticommutative** or descriptions of **lacking commutativity**)

(20) This person of African and Wampanoag descent may have thrown a piece of wood at Hugh Montgomery before being shot twice. For ten points each,

Name this dock worker who died almost instantly when a company under Thomas Preston opened fire into a taunting crowd outside the Old State House.

ANSWER: Crispus **Attucks**

Attucks was the first person killed in this event on March 5, 1770. Paul Revere made an engraving showing this event, in which five colonists died in Massachusetts' capital.

ANSWER: **Boston Massacre**

This Founding Father served as a defense lawyer for the British soldiers after the Boston Massacre, much to the chagrin of more radical patriots like his cousin, Samuel.

ANSWER: **John Adams** (prompt on "Adams" alone; do not accept "John Quincy Adams")