

Ladue Invitational Spring Tournament VI

Written and edited by the Ladue Academic Team: Raj Paul(head editor), Moses Schindler(head editor), Akshay Govindan, Glen Morgenstern, Charlie Loitman, Logan Page, Nevan Giuliani, Philip Adams, Jacob Cytron, and Maya Mutic with help from Ben Zhang, Alston Boyd, Ethan Strombeck, Pranav Sivakumar, Henry Roe, and Arjun Nageswaran

ROUND 10 - TOSSUPS

1. During a portion of glycolysis, PFK acts as both a reactant and one of these substances. Within these substances, the relationship between the rate of diffusion and reaction is given by the Thiele Modulus. The effectiveness of these substances can be reduced by certain Lewis bases in a process called (*) poisoning. A heterogeneous substance of this type has a different phase from the other molecules in the reaction. In biology, these substances are called enzymes. For ten points, name this type of substance that lowers the activation energy of a reaction without participating in it.

ANSWER: catalysts [accept enzymes until mentioned]

<CL+PA>

2. In a short story from this country, an Irishman explains the story of how he got a crescent-shaped scar, and in another work, two cellmates bond over discussion of film plots. Later in that play, it is found out that Molina is a spy sent to retrieve intelligence on Valentin's organization. Other works from this country that produced *The Form of the Sword* and (*) *Kiss of the Spider Woman* include a collection titled for a story about a point in space containing all other points as well as a collection featuring "The Library of Babel" and "The Garden of Forking Paths". For ten points, name this South American country home to Manuel Puig, and the blind author of the collections *The Aleph* and *Ficciones*, Jorge Luis Borges.

ANSWER: Argentina

<RP>

3. This material is the main component of Chantui, a major ingredient in several Chinese herbal formulas, and this material is strengthened in invertebrates when combined with sclerotin. This modified polysaccharide derivative of glucose contains nitrogen, and its monomers form beta 1-4 linkages. The acetyl amine group of this material's monomers increases hydrogen bonding between polymers, leading to greater (*) strength. This polymer is composed of N-acetylglucosamine monomers, and it can be found in the radulae of mollusks and the beaks of cephalopods. For ten points, name this compound that makes up the cell walls of fungi and the exoskeletons of crustaceans and insects.

ANSWER: chitin

<LP+RP>

4. This man recorded a piece with Ella Fitzgerald that was used in the movie "Swing Kids" as an entrance passcode. This man personified African rhythm as Madam Zajj in his piece "A Drum is a Woman". This musician, who was known for his "jungle" style, wrote a three movement symphony on African-American history in his suite *Black, Brown, & Beige*. Billy (*) Strayhorn frequently collaborated with this composer in songs such as "Mood Indigo" and "Take the A Train". For ten points, name this jazz pianist and band leader who wrote, "It Don't Mean a Thing If it Ain't Got That Swing" and earned himself a royal nickname.

ANSWER: Edward Kennedy "Duke" Ellington

<GM+RP>

5. In her most famous book, Harvard physicist Lisa Randall hypothesized that this entity could have inadvertently wiped out the dinosaurs. The current standard model of cosmology is named for this entity, one type of which is said to be "self-interacting". This entity was first proposed using the virial theorem along with observations from the (*) Coma cluster, while later more evidence of its existence came from galaxy rotation curves. The energy analogue of this concept was created to explain how the universe's expansion is accelerating. For ten points, name this unobservable form of matter thought to make up roughly 80 percent of all matter in the universe.

ANSWER: dark matter

<AG>

6. Due to a previous relationship, one character on this show refuses to date blonde women, and that character also asks his coworker if she really believes he would leave his gold in a safe “buried underground where anyone can find it”. Another character on this show buys a Batman suit on “Treat (*) Yo Self” day, and that character bankrupted his town by trying to build a sports complex called “Ice Town”. In this show, one character starts the Entertainment 720 company after he sells his shares in the Snakehole Lounge; that character is Tom Haverford. For ten points, name this NBC show, set in Pawnee, Indiana, which follows the lives of characters like Ron Swanson and Leslie Knope in a certain government department.

ANSWER: Parks and Recreation

<BS+MS+RP>

7. In a book by this man, a group of people are killed after approaching an object with a white flag, and that group includes the astronomer Ogilvy. Ten “masses of flaming gas” are associated with ten hollow cylinders in that novel by this author, which was adapted as a radio play that supposedly caused mass panic. This author wrote a story in which a character accidentally creates a forest fire that kills (*) Weena, even though the fire was only meant to distract the Morlocks, who, along with the Eloi, are the main humanoid species the narrator encounters in the year 802,701. For ten points, name this British author of *The War of the Worlds* and *The Time Machine*.

ANSWER: Herbert George Wells

<MS>

8. Nazi engineers designed the Varda Viaduct along one of this country's main rail lines, which traverses the Taurus Mountains on the way to Adana. That mountain range lies to the south of the Pontic Mountains, which lie on this country's northern coast. The Atakule Tower gives a view of Kocatepe Mosque in this country's capital, and its largest city features the harbor of Yenikapi where “millions” reportedly rallied behind the Justice and Development Party after an event that closed that city's Fatih (*) Sultan Mehmet bridge and Bosphorus Bridges. For ten points, name this country on the Anatolian peninsula whose most populous city is Istanbul.

ANSWER: Republic of Turkey [or Türkiye Cumhuriyeti]

<HR>

9. Saint Sebastian and Saint Anthony stand on either side of the central scene while a baby goat looks up in a depiction of this event within the *Isenheim Altarpiece*. A painting by Raphael of this scene gives facial features to the moon, but not the sun, and shows angels flying next to a post with the letters “I-N-R-I”, and that work is titled for Ludwig Mond. In another painting of this event, that Dali painted in his (*) *Corpus Hypercubus*, a Lithuanian flag flies behind a burning synagogue and a menorah lies at the feet of the central figure. For ten points, name this event Marc Chagall painted “White” which shows Jesus on the cross.

ANSWER: Crucifixion of Jesus Christ [accept “Isenheim Altarpiece” before “this event”; accept equivalents like “Jesus on the cross” before mention]

<RP>

10. The third section of this work cites a book by Pierre-Joseph Proudhon as an example of a complete system that includes economists, philanthropists, and humanitarians. Confiscating the property of emigrants and rebels and abolishing all rights of inheritance are among the ten measures of this book that will be applicable in most countries. The preamble to this work states that “all the powers of Old Europe have entered into a holy (*) alliance” that includes the pope, tsar, Metternich, and Guizot. This work outlines the distinctions between the ruling bourgeoisie and working proletariat and explains the problems with capitalism, beginning with the line, “A spectre is haunting Europe”. For ten points, identify this revolutionary work that calls for the workers of the world to unite, by Karl Marx and Friedrich Engels.

ANSWER: *The* Communist Manifesto

<RP>

HALFTIME

11. This entity contains the Mayall II globular cluster, and Ernst Hartwig detected the only recorded supernova in this entity, SN 1885A. Heber Curtis used dark cosmic dust in this entity, as well as its Doppler shift, to show that it was not part of the Milky Way. William Herschel noted a red color in the center of this entity, which will collide with the (*) Milky Way in roughly 4 billion years to most likely form an elliptical galaxy. This largest member of the Local Group is number 31 in the Messier catalogue. For ten points, name this spiral galaxy, the closest major one to the Milky Way.

ANSWER: Andromeda galaxy

<AG>

12. The cannonball problem asks when the number of cannonballs used to form a pyramid is one of these numbers. Lagrange proved that every positive integer can be written as the sum of four of these numbers, and Fermat proved that a prime can be expressed as the sum of (*) two of these numbers if and only if it has a remainder of 1 when divided by 4. If the square root of a positive integer is rational, then the number must be one of these, and the sum of the first n odd numbers is always equal to one of these numbers. For ten points, name these integers such as 1,4,9, and 16, which are equal to a number multiplied by itself.

ANSWER: perfect squares

<MS>

13. The Lancaster Agreement ended one conflict in this country, and the bishop Abel Muzorewa briefly served as its leader. A fifteen year civil war in this country was known as the Bush War, and ended a majority white government under Ian Smith. This country saw conflict between the British colonizers and the native Ndebele people. This country shares its name with an ancient kingdom and "Great" city, and was earlier named after the Governor of the Cape Colony. The current president of this country, who has led the(*) ZANU-PF party for over 40 years and won narrowly over Morgan Tsvangirai in 2008, is Robert Mugabe. For ten points, name this African country formerly known as Rhodesia, whose capital is Harare.

ANSWER: Republic of Zimbabwe [prompt on "Rhodesia" until mentioned]

<RP+ES>

14. A text of this religion states that a certain type of person should "avoid fellowship with evildoers," and that section describes the attributes of a true seeker. An event started by a leader of this faith, Shoghi Effendi, led to the establishment of a central building in this religion, that event was the (*) "Ten Years Crusade". The primary text of this religion is the Book of Certitude, and the calendar of this religion has nineteen months each with nineteen days. The center of this religion is found in Haifa, Israel, and is known as the Universal House of Justice. For ten points, name this religion founded in Persia by Bahá'u'lláh.

ANSWER: Baha'i [accept Baha'ism, accept Baha'ivvah]

<MS>

15. The concentration of this element in the cytoplasm is increased in a pathway in which PIP2 is hydrolyzed to make the secondary messengers DAG and IP3, the PLC pathway. Parathyroid hormone causes increased reabsorption of this element by the kidney, and the release of this element from the sarcoplasmic reticulum when it is stimulated results in (*) muscle contraction. Neurons release neurotransmitters when voltage-dependent channels for this element allow it to enter, and Osteoporosis can occur due to a deficiency of this element. For ten points, identify this element that Vitamin D helps absorb, whose symbol is Ca.

ANSWER: calcium

<LP>

16. After crashing his car, a literary character with this profession finds a farm where an old woman repeats to him three times that "Sonny ain't here." That death of that character, R.J. Bowman, is described in a novel by Eudora Welty. Another character with this profession is fired by Howard (*) Wagner and sees the neighbor's son Bernard tell him that his own son will fail his math class in one of his flashbacks. That character eventually crashes his car in the play in which he appears to give life insurance money to Linda, Happy, and Biff. For ten points, name this profession held by Willy Loman, whose death is described in a play by Arthur Miller.

ANSWER: salesman [accept Traveling Salesman Shoe Salesman]

<RP>

17. After this case, Sarah Weddington, who represented the plaintiff, was elected to three consecutive terms in the Texas House of Representatives. In a 1989 case from Missouri, Justice O'Connor refused to reconsider the holding in this case. Three years later, she co authored a joint opinion on this case with Justices Kennedy and Souter, adopting an undue burden standard, and rejected Harry (*) Blackmun's "trimester" framework. This case resulted in the creation of the Hyde Amendment, and in it the plaintiff Norma McCorvey admitted of falsely accusing rape after becoming pregnant with her third child. For ten points, name this Supreme Court case that resulted in the legalization of abortions.

ANSWER: Roe v. Wade [or Wade v. Roe]

<RP+SP>

18. A bark rope used by Enkai to transport these animals from the sky to the earth was cut down, stopping all of these animals from reaching the Maasai people, and because he mocked the goddess Selene, Ampelos was killed by one of these animals. After riding a chariot to Erytheia, (*) Hercules killed Geryon in order to obtain these animals for his tenth labor. Shiva's mount is one of these animals in Hindu mythology named Nandi, and as revenge, Hera sent a gadfly to constantly sting Io after she became one of these animals. For ten points, name these sacred animals in Hindu mythology, which can be milked.

ANSWER: cattle [or cows, accept bull]

<MS>

19. This man was depicted holding a broken sword in a sculpture that stands outside the Notre-Dame-des-Champs station. Louis Gregori attempted to assassinate this man in 1908 while he was at the interment of a close friend at the Pantheon. This man, the subject of four poems by Frances Earl Coates, was accused of an act actually committed by (*) Ferdinand Esterhazy, was imprisoned at Devil's Island, and was defended in an open letter published in Paris newspapers. For 10 points, name this French Jewish artillery officer wrongly accused of espionage in a namesake Affair and defended by Emile Zola in the letter J'accuse.

ANSWER: Alfred Dreyfus

<ES>

20. In a story by this author, Ilya's greed for timber results in the death of a character after he tears down the title edifice. Lev Rubin and Gleb Nerzhin are among many occupants of a sharashka who choose to stop working in a work by this author, and Asya advises the (*) amputation of Dyomka's leg to Oleg Kostoglotov in another novel by this author. This author wrote about Tiurin, Tzesar, and Alyosha the Baptist in his most famous work, which describes the daily routine of the main character in a Soviet labor camp. For ten points, name this Russian author of works such as *Matryona's House*, *In the First Circle*, *Cancer Ward*, and *One Day in the Life of Ivan Denisovich*.

ANSWER: Aleksandr Solzhenitsyn

<RP>

End of regulation, only proceed if tied

21. This man sent statues made of wood instead of pure gold to the Mitanni king Tushratta, leading to conflict between those two men. The "Younger Lady" mummy is most likely this man's sister and wife, while the tomb KV55, discovered by Edward Ayrton, likely contained the mummy of this pharaoh. This leader created a new capital on the east bank of the Nile, (*) Amarna. Shortly after the beginning of his reign, this man removed the "Amun" from his own name, signifying a change in official religion. For ten points, name this husband of Nefertiti and father of Tutankhamun, who instituted the first example of monotheism by worshipping the sun god Aten.

ANSWER: Akhenaten [accept Amenhotep IV and Amenophis IV]

<GM>

22. The former Prime Minister of Ukraine Pavlo Lazarenko was one of many leaders mentioned in these documents. These publications were created by law firm Mossack Fonseca, Edward Snowden called them the "biggest leak in the history of data journalism." As a result of these documents, Sigmund Gunnlaugsson, the Prime Minister of (*) Iceland, resigned. Soccer star Lionel Messi was found guilty of tax fraud after these documents were leaked as well. For ten points, name these documents leaked by the ICIJ, which showed how multiple corporations and individuals avoided paying higher taxes.

ANSWER: The Panama Papers

<AN>

BONUSES

1. Bonus: Dogri, Ladakhi, and Pashto are languages spoken in this region, which contains the Zaskar valley. For ten points each:

[10] Identify this northern area of the Indian subcontinent, which is contested by India and Pakistan.

ANSWER: **Kashmir**

[10] Kashmir lies between the Pir Panjal range and this range, which contains the second highest peak on Earth, K2.

ANSWER: **Karakoram** range

[10] West of the Karakoram mountains lies this other range in much of Afghanistan and northern Pakistan. Tirich Mir is its highest peak, standing over 25,000 feet tall.

ANSWER: **Hindu Kush**

<AG>

2. Bonus: "Of Youth" and "Of Beauty" are movements from this symphony. For ten points each:

[10] Name this symphony that contains six movements, and was inspired by Chinese literature. It is unnumbered as to avoid the "curse of the ninth."

ANSWER: *Das **Lied von der Erde*** (or ***Song of the Earth***)

[10] *Das Lied von der Erde* was composed by this man, who wrote symphonies like "Titan" and "Resurrection." His 8th symphony is often called the "Symphony of a Thousand"

ANSWER: Gustav **Mahler**

[10] Four of the six movements in *Das Lied von der Erde* are based on the writings of this ancient Chinese poet who wrote "Waking from Drunkenness on a Spring Day", "The Hard Road to Shu", and "Quiet Night Thought."

ANSWER: **Li Po** (accept **Li Bai** or **Li Bo**)

<GM>

3. Bonus: In this novel, the character Zabeth enrolls his son in Father Huismans' school. For ten points each:

[10] Name this novel in which Salim tries to create a business in an African country ruled by the "Big Man".

ANSWER: **A Bend in the River**

[10] *A Bend in the River* is a novel by this Trinidadian-born author, who also wrote about Mr. Popo in *Miguel Street*.

ANSWER: V.S. **Naipaul** (accept Vidiadhar Surajprasad **Naipaul**)

[10] In this most famous novel by Naipaul, the main character Mohun stays with the Tulsi family since he does not have the title structure.

ANSWER: **A House for Mr. Biswas**

<AG>

4. Bonus: Bokors are people in this religion who practice black magic. For ten points each:

[10] Name this Haitian religion which incorporates many African ideas and makes wide use of dolls.

ANSWER: **Voodoo**

[10] These spirits in Voodoo act as a connection between Bondye, the creator, and humans. Their name's origin is in the French word for "the laws".

ANSWER: **Loas**

[10] This other Caribbean religion was developed by Yoruban slaves after arriving in the New World. Largely practiced by the Lucumi people in Cuba, this religion often sacrifices animals like chickens to satisfy *orishas*, or spirits.

ANSWER: **Santeria**

<AG>

5. Bonus: Two politicians in this city were unable to join its Legislative Council after making anti-China remarks in their oaths and displaying a flag saying “[this city] is not China. For ten points each:

[10] Identify this former British colony and current autonomous region, located on the southeast coast of China.

ANSWER: **Hong Kong**

[10] Hong Kong was the sight of major pro-democracy protests in 2014, largely led by this now nonexistent student group, which advocated an education system in Hong Kong independent of Beijing’s authority.

ANSWER: **Scholarism**

[10] Those protests were often called a “revolution” of these items, which were used by protesters to defend themselves against pepper spray and tear gas. These items were often turned inside out to better shield activists from the tear gas.

ANSWER: **umbrellas**

<AG>

6. Bonus: Examples of these include broccoli and the coast of Great Britain. For ten points each,

[10] Name these shapes which have a repeating pattern at every scale. They can have non-integer values for their Hausdorff dimensions.

ANSWER: **fractal**

[10] This man coined the term “fractal” in 1975. His namesake set is the set of all complex numbers c such that z^{2+c} is bounded when iterated from $z=0$.

ANSWER: Benoit B. **Mandelbrot**

[10] This fractal starts with an equilateral triangle and recursively adds an equilateral triangle to each side of the previous figure. Although its perimeter diverges, its area approaches exactly 1.6 times the area of the original triangle.

ANSWER: **Koch** Snowflake [or **Koch** curve, star, or island. Prompt on **snowflake**]

<MS>

7. Bonus: In a certain poem, this entity “comes / on little cat feet”. For ten points each:

[10] Name this natural phenomenon that titles a poem in which it “sits looking over harbor and city / on silent haunches / and then moves on”.

ANSWER: **“Fog”**

[10] “Fog” was written by this American poet. He orders to “Pile the bodies high at Austerlitz and Waterloo / Shovel them under and let me work” in his poem “Grass”.

ANSWER: Carl **Sandburg**

[10] Carl Sandburg called this home city of his “Hog Butcher for the World / Tool Maker, Stacker of Wheat” in his most famous poem, which is titled after this city.

ANSWER: **Chicago**

<RP>

8. Bonus: These things can come in wedge and stovepipe varieties. For ten points each:

[10] Identify these meteorological phenomena that can originate from funnel clouds.

ANSWER: **tornadoes**

[10] This scale named for a Japanese researcher rates the severity of tornadoes based on their destruction to human buildings as well as vegetation. The enhanced type of this scale is now used in the U.S.

ANSWER: **Fujita** scale (also **F-scale**, **Fujita-Pearson** scale, or **FPP scale**)

[10] These entities occur when a tornado forms over water. Most of these are weak rotating air columns over water.

ANSWER: **waterspouts**

<AG>

9. Bonus: When this woman was told she could have as much land as she could cover with the hide of an ox, she cut the hide into thin strips and encircled a hill. For ten points each:

[10] Name this queen of Carthage, who famously committed suicide by falling on a sword that was given to her by her lover.

ANSWER: Dido [accept Elissa]

[10] That lover of hers was this man, who fled Troy after it was sacked at the end of the Trojan War. This son of Venus is the subject of an epic by Virgil.

ANSWER: Aeneas

[10] This father of Aeneas became lame when Zeus struck him in the foot with a thunderbolt after bragging that he had an affair with Venus, so Aeneas had to carry him out of Troy on his back. Unfortunately, he died before they could reach Italy.

ANSWER: Anchises

<MS>

10. Bonus: Lars Porsena ruled this civilization's city of Clusium. For ten points each:

[10] Name this ancient Italian civilization whose people referred to themselves as the Rasenna and lived on the coast of the Tyrrhenian Sea.

ANSWER: Etruscans

[10] The fall of the Etruscans came with the rise of this civilization. After killing his twin Remus, Romulus founded this city on Palatine Hill.

ANSWER: Rome

[10] The last King of Rome was this man, who was of Etruscan descent. After his son raped Lucretia, the Roman Kingdom fell and became the Roman Republic.

ANSWER: Tarquin the Proud

<RP>

11. Bonus: This work ends by noting how the "black bank of clouds" and the "tranquil waterway" seemed to create the title location. For ten points each:

[10] Identify this novella in which Charles Marlow visits the post of ivory trader Kurtz in the Congo.

ANSWER: Heart of Darkness

[10] This Polish-British writer wrote *Lord Jim* and *The Secret Agent* in addition to *Heart of Darkness*.

ANSWER: Joseph Conrad (accept Józef Teodor Konrad Korzeniowski)

[10] In this other Conrad work, the title Italian character travels to the island of Great Isabel with Martin Decoud to keep silver away from the fictional government of Costaguana.

ANSWER: Nostramo

<AG>

12. Bonus: Rachel Carson's book *Silent Spring* started a national environmental movement and eventually led to the creation of the Environmental Protection Agency. For ten points each:

[10] *Silent Spring* shared many of the harmful impacts of the spraying of this colorless chemical used to kill mosquitos, including its carcinogenic nature.

ANSWER: DDT [or dichlorodiphenyltrichloroethane]

[10] DDT has been known to cause eggshell thinning and lower reproductive success in this species, and is thought to be responsible for the decline in population of this bird, the national animal of the United States.

ANSWER: bald eagles [prompt on "eagle"]

[10] Persistence and food chain energetics can lead to this phenomenon, which is responsible for higher concentrations of certain compounds such as DDT at higher trophic levels in a food chain.

ANSWER: biomagnification

<LP>

13. Bonus: This man pioneered the use of coordinates to represent geometrical problems. For ten points each:

[10] Name this French philosopher who famously stated “Cogito, ergo sum,” or, “I think, therefore I am” in his *Discourse on the Method*.

ANSWER: Rene **Descartes**

[10] Descartes also advocated this belief about the separateness of the material body but non-material mind, connected through the pineal gland.

ANSWER: Mind-body **dualism** [or Cartesian **dualism**, or mind-body **dichotomy**]

[10] In *Meditations on First Philosophy*, Descartes described an argument about this substance. He noted that many of its properties, such as sight, look, and shape change when it melts, supporting his belief in the uncertainty of our observations.

ANSWER: **wax** [accept **Wax** argument]

<MS>

14. Bonus: Identify the following World War II battles of the Pacific Theater, for ten points each:

[10] This 1942 battle proved to be a turning point in the Pacific campaign after all four of Japan’s aircraft carriers were demolished by the U.S. Navy, led by Chester Nimitz.

ANSWER: Battle of **Midway**

[10] Three years after Midway, the Allies were victorious at this lengthy battle fought shortly prior to the bombing of Hiroshima. After a series of “island hopping”, the Allies reached the Ryukyu Islands, where this battle would be fought.

ANSWER: Battle of **Okinawa**

[10] The Pacific Theater also included this battle, which was not only the largest naval battle of the war, but in all of history. It included several kamikaze attacks and commenced after the Allies invaded the Phillipines.

ANSWER: Battle of **Leyte Gulf**

<RP>

15. Bonus: Examples of these types of works include “How the frog lost its tail” and “How the zebra got its stripes.” For ten points each:

[10] Name these stories, often with non-human subjects, that aim to teach a moral or some other lesson. A famous one describes how a fox tries and fails to reach some grapes, and then concludes that he didn’t want them anyway.

ANSWER: **fables** [prompt generously on things like “tales”, “myths”, “legends”]

[10] This French author compiled hundreds of fables into several volumes in his *Fables*. He also wrote *The Loves of Cupid and Psyche*.

ANSWER: Jean de **La Fontaine**

[10] This Ancient Greek author also wrote a number of fables, including “The Lion and the Mouse” and “The Tortoise and the Hare”.

ANSWER: **Aesop**

<MS>

16. Bonus: This artist's sister wrote a poem about the sisters Laura and Lizzie, who are persuaded into eating some delicious fruit, *Goblin Market*. For ten points each:

[10] Name this man, a British writer and artist, whose painting *Beata Beatrix* shows a woman praying.

ANSWER: Dante Gabriel Rossetti

[10] Dante Gabriel Rossetti co-founded an art movement with John Everett Millais, who painted *Ophelia*, as well as a heavily criticized painting of *[This figure] in the House of his Parents*. That painting shows this man as a boy being kissed on the cheek by his mother while in St. Joseph's workshop.

ANSWER: Jesus Christ [accept either underlined portion]

[10] With William Holman Hunt, Rossetti and Millais founded this 19th-century British art movement which sought to reform art by rejecting the influence of a certain Italian Renaissance painter.

ANSWER: Pre-Raphaelite Brotherhood [accept PRB]

<RP>

17. Bonus: Robert Hooke built the J-shaped apparatus used to derive this law. For ten points each:

[10] Name this gas law that states the product of the pressure and volume of a gas is constant for a given sample at a specific temperature.

ANSWER: Boyle's law

[10] This gas law named for an Italian says that the volume of a gas is directly proportional to the number of moles of gas particles.

ANSWER: Avogadro's law

[10] This other gas law, first described by Emile Clapeyron, was notably modified by van der Waals to account for intermolecular forces and particle volume. This law combines Avogadro's, Boyle's and Charles' laws.

ANSWER: ideal gas law

<AG>

18. Bonus: This ruler's heart lies in Stockholm's Riddarholm Church. For ten points each:

[10] Name this Swedish king from the House of Vasa, a "Lion of the North" who died at the Battle of Lutzen.

ANSWER: Gustavus Adolphus of Sweden [or Gustav Adolf; or Gustavus II Adolf]

[10] Gustavus Adolphus commanded Sweden in this war, which consisted of four phases and ended with the Treaty of Westphalia.

ANSWER: Thirty Years' War

[10] After Gustavus Adolphus died, this advisor of his took charge and continued to lead Swedish forces. He would go on to serve as advisor to Gustavus Adolphus' daughter and successor, Cristina.

ANSWER: Axel Oxenstierna

<RP>

19. Bonus: Thanksgiving is the only day when Americans consume more food than they do on the day of this event. For ten points each:

[10] Name this annual championship game of the NFL that determines who will hoist the Vince Lombardi Trophy.

ANSWER: Super Bowl

[10] The 2016 Super Bowl 50 saw this AFC west team defeat the Carolina Panthers. Led by Peyton Manning, this team plays their regular season home games at the Sports Authority Field in Colorado.

ANSWER: Denver Broncos [accept either underlined portion]

[10] This linebacker from the Broncos was named the Most Valuable Player of Super Bowl 50.

ANSWER: Vonnie B'Vsean Miller Jr.

<RP>

20. Bonus: This man created the Natal Indian Congress, which aimed to combat unfair treatment against Indians in South Africa. For ten points each:

[10] Name this Indian independence leader, famous for his salt marches, who advocated for equal treatment for untouchables, and nonviolent practices.

ANSWER: Mohandas Karamchand Gandhi (both underlined parts required; prompt on Gandhi; accept Mahatma Gandhi)

[10] This first prime minister of India gave a speech entitled “The light has gone out of our lives” after Gandhi was assassinated, and two years after this man’s death his daughter Indira Gandhi became prime minister.

ANSWER: Jawaharlal Nehru

[10] Nehru delivered this other speech on the night of India’s independence, describing how India will become new again and give equality to all, “never allow[ing] that torch of freedom to be blown out”.

ANSWER: Tryst with Destiny speech

<AG>

21. Bonus: In astrophysics, this effect causes a change in the spectrum of a body. For ten points each:

[10] Name this effect in which a change in an observer’s motion relative to the source of a wave causes a change in the observed frequency of the wave.

ANSWER: Doppler effect

[10] If source of light is moving away from an observer, its spectrum will shift to this end.

ANSWER: red

[10] This American astronomer used the redshifts of galaxies to infer their recessional velocities were increasing, and postulate a fundamental idea in cosmology.

ANSWER: Edwin Hubble

<AG>

22. Bonus: It begins with the piano repeating a sequence of G major and F major chords, which is then picked up by the winds while the bass plays a seven note riff in between. For ten points each:

[10] Name this first track of an album that innovated modal based jazz and has been called the best jazz album of all time, *Kind of Blue*.

ANSWER: “So What”

[10] “So What” appears on *Kind of Blue*, an album by this trumpeter that earlier recorded *Sketches of Spain* and *Birth of the Cool*.

ANSWER: Miles Davis

Miles Davis later recorded this fusion jazz album that includes “Pharaoh’s Dance” and a track named after jazz guitarist John McLaughlin.

ANSWER: Bitches’ Brew

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