

2014 BELLum Omnium Contra Omnes

Packet 4: Tossups

1. Every integer can be represented as a unique sum of one or more distinct, nonconsecutive numbers in this series, according to Zeckendorf's theorem. An integer x is in this series if one or both of "five x squared plus four" or "five x squared minus four" is a perfect square, a consequence of Binet's formula. The shallow diagonals in Pascal's triangle sum to these numbers, which were used by their namesake to describe the population of a group of rabbits. As this series gets larger, the ratio of consecutive numbers in this series approaches the golden ratio. For 10 points, name this set of numbers with terms generated by adding the two preceding numbers, which begins 1, 1, 2, 3, 5.
ANSWER: **Fibonacci** numbers [or **Fibonacci** sequence; or **Fibonacci** series]

2. In Jainism, *āsrava* is the influx of this substance, which is released through *nirjara*, and *arihants* have eliminated the four *ghati* forms of this substance. Sikhism explains this concept with the influence of the three qualities of *Maya*, and Gurbani's law of this concept likens it to a seed through which one can obtain fruits. In Theravada Buddhism, the five *anantarika* forms of this concept will definitely affect either a person's present life or the next. For 10 points, name this concept in many Indian religions that affects when one can attain *moksha* and escape the cycle of *samsāra*, the belief that actions will influence one's future lives.
ANSWER: **karma** [or **kamma**]

3. Archangels appear as soloist parts in this composer's chorale "The Heavens are Telling," which is part of a work that opens with "The Representation of Chaos." He composed an anthem for Franz II that became the *Deutschlandlied* and used the melody of that anthem in his "Emperor" Quartet, written in a musical form that he developed. This composer's works were catalogued by Anthony van Hoboken. This composer placed a sudden fortissimo chord in the middle of an otherwise soft movement in his "Surprise Symphony." For 10 points, name this court composer of Prince Esterhazy, considered the "Father of the String Quartet" and "Father of the Symphony."
ANSWER: Franz Joseph **Haydn**

4. The ratio between the volume of these entities and the volume of their counterparts defines the compressibility factor, and the Sackur-Tetrode equation solves for the entropy of a specific type of these substances. A molecule of these substances has an average kinetic energy of three-halves times Boltzmann's constant times the absolute temperature. Johannes van der Waals generalized these substances' namesake equation by accounting for differences in pressure and volume; that law can be written as "PV equals nRT." For 10 points, name these theoretical substances that consist of randomly moving point particles unaffected by intermolecular forces.
ANSWER: **ideal gases** [prompt on "**gases**"]

5. In one folk tale, a bamboo cutter finds a baby exiled from this location in a glowing bamboo stalk, and in another, Wu Gang attempts to cut down a self-healing laurel tree at this location. In one mythology, Tecciztecatl became this object after a rabbit was thrown in his face, and other mythologies view this object as the head of Coyolxauhqui ("koh-yol-SHAW-kee") or the left eye of Horus. The principal Greek goddess of this object fell in love with Endymion and asked Zeus to put him in an eternal sleep. Another Greek goddess of this object also protected hunters and virgins. For 10 points, name this celestial body associated with Selene and Artemis, often contrasted with the Sun.
ANSWER: **moon**

6. The title object of one of this author's poems is "dressed up like a warrior" and stripped "scale by scale" before being eaten. The speaker of another of this author's poems "[looks] at the crystal moon" and "[touches] the impalpable ash" in a poem that mourns his exile, "If You Forget Me." This poet of the collection *Elemental Odes* concluded one work with "speak through my words and my blood." That poem is "The Heights of Macchu Picchu" and appears in his collection *Canto General*. In another collection this poet laments, "Tonight I can write the saddest lines." For 10 points, name this Chilean poet of *Twenty Love Poems and a Song of Despair*.
ANSWER: Pablo **Neruda** [or Neftalí Ricardo **Reyes Basoalto**]

7. These objects were not to be used if there were cumulonimbus clouds within ten nautical miles, or if winds exceeded thirty knots. The concept for these objects was originally researched for military use as the X-20 Dyna-Soar. One of these objects was destroyed after a piece of insulation foam fell off and hit other heat shielding panels. The Rogers Commission investigated that destruction of another of these vehicles during liftoff and found it to have been caused by faulty O-rings. For 10 points, name these five spacecraft retired in 2011 that included *Discovery*, *Atlantis*, *Endeavour*, *Columbia* and *Challenger*.

ANSWER: Space Shuttle orbiter vehicle [accept either underlined part]

8. Richard Réti studied an endgame in which White must protect this piece while preventing Black's piece of this type from advancing. In an endgame, one of these pieces is called a "wrong rook" one when a bishop cannot attack a piece blocking this piece's advance. This piece delivers a checkmate in David and Goliath's mate. One of these pieces may capture another *en passant* when its advance doubles on the first move. A piece of this type may be promoted to another piece of the player's choice when it reaches the opposite side of the board. For 10 points, name this lowest chess piece that represents a pikeman, who attacks one space diagonally but otherwise moves one space forward.

ANSWER: pawn

9. This character calls on Valdes and Cornelius after he is frustrated by the limits of logic, medicine, law and divinity. During Easter, this character is confused when trying to translate the first sentence of the Gospel of John, and he decides against poisoning himself after he hears church bells ring. His lover drowns their illegitimate child after this character kills her brother. This lover of Gretchen was granted unconditional service from another character for the remaining twenty-four years of his life in a pact that he signed in blood. For 10 points, name this subject of plays by Christopher Marlowe and Johann Wolfgang von Goethe, a man who sells his soul to the devil.

ANSWER: Faust [accept Doctor John Faustus or Heinrich Faust]

10. The city of Bremen claimed imperial immediacy in this agreement and separated from the Prince-Archbishopric of Bremen, which later caused conflict in the Swedish-Bremen Wars. This agreement partitioned Pomerania between Brandenburg-Prussia and Sweden and officially recognized the independence of the Dutch Republic from Spain. This agreement officially recognized the principle of *cuius regio, eius religio*, first established by the Peace of Augsburg. This agreement gave much territory to France due to the efforts of Cardinal Mazarin. For 10 points, name this series of agreements in 1648 consisting of the Treaties of Münster and Osnabrück, which ended the Thirty Years' War.

ANSWER: Peace of Westphalia [accept Treaty of Osnabrück or Instrumentum Pacis Osnabrugensis before "Dutch Republic"]

11. This country contests possession of the Halayeb Triangle with its northern neighbor. After British approval for administration by its northern neighbor in 1899, this country gained its independence in 1956 under Isma'il Al-Azhari. With a southern neighbor, this country fought for control of the Abyei region, and this country signed the Comprehensive Peace Agreement with that Salva Kiir-led neighbor. The current leader of this country, Omar al-Bashir, is being sought by the International Court of Justice for war crimes against people in this country's Darfur region. For 10 points, name this African country with capital Khartoum whose southern half split off in 2011.

ANSWER: Republic of the Sudan [or *Jumhūrīyat as-Sūdān*]

12. The title figure of this poem "on honey-dew hath fed, / And drunk the milk of Paradise," leading the author to warn "Beware! Beware!" The inspiration for this poem supposedly came from a dream after the author had fallen asleep reading *Purchas his Pilgrimage* but was interrupted by "a person on business from Porlock." This poem describes "forests ancient as the hills / Enfolding sunny spots of greenery," as well as "an Abyssinian maid, / [playing] on her dulcimer... / Singing of Mount Abora." For 10 points, name this poem describing "a sunny pleasure-dome with caves of ice" in Xanadu, home of the title figure, written by Samuel Taylor Coleridge.

ANSWER: "Kubla Khan;" Or, A Vision in a Dream. A Fragment."

13. This man was forced to flee to the Jinggang Mountains after the failed Autumn Harvest Uprising, and he became the leader of his party at the Zunyi Conference. This man sought to eliminate sparrows in the Four Pests Campaign as part of the Great Leap Forward. He led his forces from Jiangxi to Shaanxi to escape Kuomintang persecution as part of the Long March. This man ordered high school graduates “up the mountains and down to the countryside” in a movement that also included the formation of his Red Guard, who distributed his *Little Red Book*. For 10 points, name this first Chairman of the Communist Party of China who led the Cultural Revolution.

ANSWER: **Mao** Zedong [or **Mao** Runzhi; or **Mao** Yongzhi; accept Chairman **Mao** or **Mao zhuxi**]

14. This man wrote that anxiety arises from the “dizziness of freedom.” According to this man, the self must renew faith in God constantly because it is “a relation [relating] itself to itself.” He described aesthetics, ethics and religion as the three stages of life. He also stated that distinction between good and evil depends on God, justifying Abraham’s sacrifice of Isaac as a “teleological suspension of the ethical.” This man wrote under pseudonyms such as Victor Eremita and Johannes de Silentio in order to separate himself from his ideas. For 10 points, name this Danish existentialist philosopher and author of *Fear and Trembling* and *Either/Or*.

ANSWER: Søren Aabye **Kierkegaard** [prompt on “**Vigilius Haufniensis**” or “**Anti-Climacus**”; prompt on “**Johannes de Silentio**” before mentioned]

15. The album *Body and Soul* featured one player of this instrument, Coleman Hawkins. “Cannonball” Adderley and another performer of this instrument were featured by Miles Davis on *Kind of Blue*. An album by a player of this instrument contains the piece “St. Thomas” and is titled this instrument’s “Colossus.” This instrument played by Sonny Rollins is the central instrument of the “Yardbird Suite.” Another performer of this instrument had a distinctive style described as “sheets of sound” and played the tenor variety of this instrument on the album *A Love Supreme*. For 10 points, name this jazz instrument played by Charlie “Bird” Parker and Johnny Coltrane.

ANSWER: **saxophone** [accept any of tenor **saxophone**, alto **saxophone**, soprano **saxophone**]

16. During this war, Michael Barkai used Gabriel missiles to destroy an enemy fleet at the Battle of Baltim. After this war, the inadequate defenses of one side were investigated by the Agranat Commission. Moshe Dayan urged nonaggression at the beginning of this war. After this war, Yitzhak Rabin became Prime Minister after the resignation of Golda Meir. This war began when Egyptian troops crossed the Suez Canal in Operation *Badr* and Syrian troops attacked the Golan Heights to take back land lost during the previous Six-Day War. For 10 points, name this 1973 war in which Israel defended its territories from invasion on the Jewish Day of Atonement.

ANSWER: **Yom Kippur** War [accept **1973 Arab-Israeli** War before “1973”; accept *Milhemet Yom HaKipurim* or *Milhemet Yom Kipur* or **October** War; accept **Ramadan** War or *ḥarb 'Uktōbar* or *ḥarb Tišrīn*; prompt on “**Arab-Israeli** War”]

17. This author referred to the title location as the “morgue between Paris and Rome” in one poem. The narrator of another of this author’s poems claims to be an arrow flying towards “the red / Eye, the cauldron of morning.” In another poem, this author warned “Herr God, Herr Lucifer / Beware / ... I eat men like air.” This author of “Lady Lazarus” admitted “I may be a bit of a Jew” while addressing “a man in black with a Meinkampf look,” “Daddy.” In her only novel, this author wrote of Esther Greenwood’s psychotherapy after an attempted suicide with sleeping pills. For 10 points, name this American author of the collection *Ariel* and *The Bell Jar*.

ANSWER: Sylvia **Plath** [or Victoria **Lucas**]

18. The condensation of two molecules of this substance forms a biuret. In the human body, this molecule undergoes a cycle which reacts ornithine and carbamoyl phosphate to form citrulline. A BUN test is used to determine levels of this substance in the blood. The reaction of silver cyanate and ammonium chloride forms this product of the Wöhler synthesis. Ammonia and carbon dioxide are reacted to form this molecule in the Bosch-Meiser process. This organic molecule consists of two amines connected by a central carbonyl group. For 10 points, name this product of ammonia processing in humans, a molecule for which urine is named.

ANSWER: **urea** [or **CO(NH₂)₂**; or **carbamide**; or **carbonyl diamide**; or **carbonyldiamine**; or **diaminomethanal**; or **diaminomethanone**]

19. This man visited the clinic of his friend Étienne-Jean Georget to paint portraits of the insane, including one of a woman suffering from obsessive envy and another of a kleptomaniac. This artist depicted four horses galloping across a green field at the title event, *The 1821 Derby at Epsom*. In another work, a Napoleonic cavalry officer holds a saber while atop a rearing horse. This artist of *The Charging Chasseur* painted a bloodstained hatchet in the right foreground of his most famous work, which arranges the subjects in a pyramid topped by a man waving a red cloth. For 10 points, name this French artist who painted the aftermath of a sunken frigate in *The Raft of the Medusa*.

ANSWER: Jean-Louis André Théodore Géricault

20. The LHC's ALICE is an experiment to create a substance of this type consisting of asymptotically free quarks and gluons. The average number of electrons in a substance of this type in a Debye sphere is this substance's namesake parameter *lambda*. A tokamak magnetically confines substances of this type to a torus. Substances of this type are studied by Langmuir probes and created through the Townsend discharge. The heliosphere is defined by the extent of a substance of this type emitted by the sun, the solar wind, and these are created by ionizing a gas at high temperatures. For 10 points, name this fourth state of matter present in stars, neon signs, and lightning.

ANSWER: plasmas

TB. One theory of this phenomenon replaces a constant with a variable scalar field, the Brans-Dicke model. The balance between outward radiation and this phenomenon acting inwardly on a body is known as the Eddington luminosity, and the bending of light due to this phenomenon is known as its namesake lensing. This force, which Einstein visualized as the curvature of spacetime in his field equations, is proportional to the inverse square of radius and the product of two masses according to a universal law named for Newton. For 10 points, name this weakest of the fundamental forces that causes objects to accelerate on Earth at 9.8 meters per second squared.

ANSWER: gravity [or gravitational force]

Packet 4: Bonuses

1. The Taniyama-Shimura conjecture was cited in the proof of this theorem as a link between elliptic curves and modular forms. For 10 points each:

[10] Name this theorem proved by Andrew Wiles. It states that no three positive integers a , b , and c can satisfy the equation " a -to-the- n plus b -to-the- n equals c -to-the- n " for integer values of n greater than two.

ANSWER: **Fermat's last theorem** [prompt on "**Fermat's conjecture**"; prompt on partial answer]

[10] Fermat is the namesake of a type of these numbers, of which his take the form " $2^{2^n} + 1$ plus one." These are numbers whose only integer divisors are themselves and one.

ANSWER: **primes** [or **prime** numbers]

[10] These numbers can be calculated by first selecting a seed between one and one less than a Fermat prime P , and multiplying that seed by a number that is a primitive root modulo P .

ANSWER: pseudor**andom** numbers

2. James Madison failed to renew the charter of the first organization of this name, but chartered the second organization of this name after the War of 1812. For 10 points each:

[10] Give this name shared by two early national financial institutions. Alexander Hamilton proposed the first of these organizations in his Second Report on Public Credit, and Andrew Jackson strongly opposed the second one.

ANSWER: **Bank of the United States** [accept First **Bank of the United States** or Second **Bank of the United States**]

[10] In this Supreme Court case, John Marshall ruled that a state tax on a branch of the Bank of the United States was unconstitutional.

ANSWER: *James McCulloch v. The State of Maryland, John James*

[10] This Whig rival candidate of Andrew Jackson in the election of 1832 introduced the recharter of the Second Bank to Congress four years early in hopes of winning national support against Jackson.

ANSWER: Henry **Clay**, Sr.

3. In this work, a fisherman chooses his form of death after opening a jar with the Seal of Solomon. For 10 points:

[10] Name this ancient collection that contains stories such as "Aladdin's Wonderful Lamp" and "Seven Voyages of Sinbad the Sailor."

ANSWER: ***One Thousand and One Nights*** [answer must contain both underlined parts; or *The Arabian Nights' Entertainment*; or *Kitāb alf laylah wa-laylah*]

[10] This legendary Persian queen is the narrator and storyteller of *One Thousand and One Nights*. She broke King Shahryar's pattern of marrying and killing a wife every day.

ANSWER: **Scheherazade** [or **Šahrzād**; or **Shahrzād**]

[10] This British explorer and polymath, who traveled to Mecca in disguise and was the first European to see Lake Tanganyika, translated an unexpurgated version of *One Thousand and One Nights* into English.

ANSWER: Richard Francis **Burton**

4. This man officially became the leader of his movement after he relieved the Siege of the Alcázar. For 10 points each:

[10] Name this generalissimo of the Nationalists who became dictator of Spain after ending the Second Spanish Republic in the Spanish Civil War.

ANSWER: Francisco Paulino Hermenegildo Teóculo **Franco** y Bahamonde Salgado Pardo de Andrade

[10] Politics during the Francoist regime after the Spanish Civil War was controlled by this fascist political party, which combined with the Carlists after the execution of its founder, José Antonio Primo de Rivera.

ANSWER: **Falange** Española Tradicionalista de las Juntas de Ofensiva Nacional Sindicalista [or Spanish Traditional **Phalanx** of the Assemblies of the National Syndicalist Offensive; or **FET** de las **JONS**]

[10] This Catalan city was the last capital of the Second Spanish Republic. Republican anarchists and communists fought in this city in its namesake May Days, and it was later bombed by the Italian *Aviazione Legionaria*.

ANSWER: **Barcelona**

5. This sect's standard collection of scriptures is the Pāli Canon. For 10 points each:

[10] Name this sect of Buddhism, which acknowledges only Gautama Buddha and teaches the incorruptibility of arahants. It is often contrasted with Mahayana Buddhism.

ANSWER: **Theravāda** Buddhism [prompt on "**Hinayana** Buddhism"]

[10] Through the *Sutta Pitaka*, Theravada Buddhism teaches that there are four steps in achieving this state. One attempts to achieve this state to become an arahant, and the first stage in that process is being a "stream-enterer."

ANSWER: **enlightenment** [or **nirvana**]

[10] The first of these statements taught by the Buddha during his first sermon states that the world contains *dukkha*, or suffering. The last of these states that enlightenment can be achieved by following the Eightfold Path.

ANSWER: **Four Noble Truths** [or **catvāri āryasatyāni**; or **cattāri ariyasaccāni**]

6. At the end of the work in which this character appears, she walks downstairs in her wedding gown and prays to the Virgin, unaware that her husband and children are watching her. For 10 points each:

[10] Name this character from *Long Day's Journey into Night* who returns home to her family uncured from her addiction to morphine. She constantly fears that her son Edmund is dying of tuberculosis.

ANSWER: **Mary** Cavan Tyrone [prompt on "**Tyrone**"]

[10] This author of *Ah, Wilderness!*, *Mourning Becomes Electra*, and *Anna Christie* wrote about the downfall of the Tyrone family in *Long Day's Journey into Night*.

ANSWER: Eugene Gladstone **O'Neill**

[10] This other play by Eugene O'Neill features the confession by "Hickey" that he murdered his wife and is set in a Greenwich Village saloon owned by Harry Hope.

ANSWER: *The Iceman Cometh*

7. This molecule can be added into cell membranes to moderate their fluidity. For 10 points each:

[10] Name this steroid molecule that can crystallize to form stones in the gallbladder. This molecule is transported by LDL in human blood.

ANSWER: **cholesterol** [or **(3β)-cholest-5-en-3-ol**]

[10] This steroid of the androgen group is derived from cholesterol and secreted by Leydig cells in the testes. This principal male sex hormone promotes the development of secondary sex characteristics.

ANSWER: **testosterone**

[10] This hormone is secreted by the posterior pituitary gland, and it triggers contractions in the uterus. In addition to causing cervical dilation during childbirth, this hormone is thought to play a role in human sexual arousal.

ANSWER: **oxytocin**

8. During battle, this deity was said to drive a chariot in front of the pharaoh while firing flaming arrows. For 10 points each:

[10] Name this lion-headed Egyptian goddess who ravaged the earth, nearly destroying all of humanity. After drinking beer dyed with red ochre and pomegranate, she transformed into the cow-headed Hathor.

ANSWER: **Sekhmet** [or **Sachmis**; or **Sakhmet**; or **Sekhet**; or **Sakhet**]

[10] Sekhmet's counterpart in Lower Egypt was this cat-headed goddess of warfare and protection, whose name translates to "She of the Ointment Jar."

ANSWER: **Bastet** [or **Ubasti**; or **Baset**]

[10] This solar deity was the father of Sekhmet and Bastet. Identified with the god Atum, this falcon-headed sun god revealed his secret name to Isis after being poisoned by a serpent.

ANSWER: **Ra** [or **Re**]

9. Albert Camus described it as the only philosophical question. For 10 points each:

[10] Name this act of killing oneself. One man studying it noted its increased prevalence among Protestant communities, as well as its decreased prevalence during times of war.

ANSWER: **suicide**

[10] Suicide was analyzed in a case study by this French sociologist, who helped develop sociology as a field with his *The Rules of Sociological Method*.

ANSWER: David Émile **Durkheim**

[10] In *The Elementary Forms of the Religious Life*, Durkheim described the process by which Native Americans attribute human qualities to these objects. These objects are paired with Taboo in a work by Sigmund Freud.

ANSWER: **totems** [or **totemism**]

10. Name some European mountain ranges, for 10 points each.

[10] This mountain range divides France from Spain. The tiny nation of Andorra lies in these mountains, which run from the Bay of Biscay to the Cap de Creus.

ANSWER: **Pyrenees** Mountains [or **Pirineos**; or **Pyrénées**; or **Perinés**; or **Pirineus**; or **Pirenèus**; or **Pirinioak**; or **Auñamendiak**]

[10] This mountain range runs the length of the Italian peninsula and is home to the rapidly-shrinking Calderone glacier. The small nation of San Marino is located around Monte Titano in this range.

ANSWER: **Apennine** Mountains [or **Apennines**; or **Appenninus**; or **Appennini**]

[10] This second-longest mountain range in Europe extends through parts of Slovakia, Romania, Poland, and Ukraine. This range joins with the Alps at the Leitha Mountains in Bratislava.

ANSWER: **Carpathian** Mountains [or **Carpathians**; or **Karpaty**; or **Karpaten**; or **Kárpátok**]

11. Only three clauses of this document are still in effect. For 10 points each:

[10] Name this document that John of England was forced to seal at Runnymede. It states that no free man can be condemned but “by lawful judgment of his Peers, or by the Law of the land.”

ANSWER: **Magna Carta** [or The **Great Charter** of the Liberties of England]

[10] A group of nobles of this rank forced John to seal the Magna Carta, but further disputes over the king’s power led to a namesake war led by these lowest-ranking nobles against John.

ANSWER: **barons** [accept First **Barons’** War or Second **Barons’** War]

[10] John also disputed with this pope over the right to appoint the Archbishop of Canterbury and was subsequently excommunicated in 1209. This pope also called the Fourth Crusade, which sacked Constantinople.

ANSWER: Pope **Innocent III** [or **Lotario** de’ Conti **di Segni**; prompt on “**Innocent**”; prompt on “**di Segni**”]

12. The equation “E equals m-c-squared” is a consequence of this theory. For 10 points each:

[10] Name this theory, formulated by Albert Einstein and contrasted with a general form. It postulates that laws of physics hold for all inertial reference frames and that light propagates through a vacuum at a definite speed.

ANSWER: **special** theory of **relativity** [prompt on “theory of **relativity**”; prompt on “**SR**” or “**STR**”; do not prompt on or accept “general theory of relativity”]

[10] Special relativity predicts this phenomenon, in which clocks moving relative to an observer appear to that observer to run more slowly compared to clocks at rest.

ANSWER: **time dilation**

[10] This Lithuanian-German mathematician names the four-dimensional setting of special relativity. This man’s spacetime model includes the Poincaré group and places a double light-cone at the center of each event.

ANSWER: Hermann **Minkowski** [accept **Minkowski** spacetime]

13. Most of this novel is narrated by Nelly Dean to Mr. Lockwood. For 10 points each:

[10] Name this novel about Heathcliff, who falls in love with Catherine Earnshaw and seeks revenge against her brother Hindley for his childhood abuse, eventually inheriting Thrushcross Grange and the title estate.

ANSWER: **Wuthering Heights**

[10] *Wuthering Heights* was written by a member of this literary family, who initially published under pseudonyms with the surname Bell. This family also included the author of *Jane Eyre*.

ANSWER: **Brontës**

[10] *Wuthering Heights* was originally published with this novel by Anne Brontë, which follows the title character’s experience as a governess for the Bloomfield and Murray families and her ultimate marriage to Mr. Weston.

ANSWER: **Agnes Grey**

14. This conflict was incited by the Plan of San Luis de Potosí. For 10 points each:

[10] Name this 1910 to 1920 conflict in a Latin American nation in which Francisco Madero overthrew President Porfirio Díaz, only to be overthrown and assassinated by Victoriano Huerta in the Ten Tragic Days.

ANSWER: **Mexican Revolution** [or *Revolución mexicana*; do not prompt on or accept “Mexican Civil War”]

[10] Porfirio Díaz resigned the presidency in a treaty at this city, where American forces later defeated Pancho Villa. This city on the border with Texas was named after a five-term president who drove the French out of Mexico.

ANSWER: Ciudad **Juárez**

[10] This commander of the Southern Liberation Army broke with Madero in the Plan of Ayala. He opposed Victoriano Huerta after the Ten Tragic Days and was later assassinated by forces under Venustiano Carranza.

ANSWER: Emiliano **Zapata** Salazar

15. The subtitles of different movements in this suite include “the Winged Messenger,” “the Bringer of Old Age” and “the Magician.” For 10 points each:

[10] Name this suite written in seven movements, each named after the seven known namesake celestial bodies.

ANSWER: *The **Planets***

[10] This British composer of *The Planets* studied under Charles Villiers Stanford and was a close personal friend of Ralph Vaughan Williams.

ANSWER: Gustavus Theodor von **Holst**

[10] This last movement of *The Planets*, subtitled “the Mystic,” ends with a women’s chorus singing in a separate room, fading out as the door to that room closes.

ANSWER: “**Neptune**, the Mystic”

16. The second painting in this series, *The Arcadian or Pastoral State*, depicts a megalithic temple in front of a river. For 10 points each:

[10] Name this five-painting series, which includes *The Savage State* and *Desolation*, that depicts the growth and fall of the namesake civilization.

ANSWER: *The **Course of Empire***

[10] This American artist of *The Course of Empire* also created *The Voyage of Life* series to represent four stages of human development. Other paintings by this man include *The Oxbow* and *The Titan’s Goblet*.

ANSWER: Thomas **Cole**

[10] Thomas Cole founded this nineteenth century school of art, which also included the painter of *Kindred Spirits*, Asher Durand. This movement notably created romanticized landscape paintings.

ANSWER: **Hudson River** School

17. President Goodluck Jonathan declared a state of emergency in response to the actions of Boko Haram in this country. For 10 points each:

[10] Name this West African country and member of the Commonwealth of Nations in which the group Boko Haram, active since 2001, has attacked cities such as Kano and Abuja in their effort to establish an Islamic state.

ANSWER: Federal Republic of **Nigeria**

[10] The French-led Operation Serval in 2013 ousted Islamists from major cities in this former French colony in the Sahara. This country also shares its name with a polity governed by Mansa Musa in the fourteenth century.

ANSWER: Republic of **Mali** [or *République du Mali*; or *Mali ka Fasojamana*]

[10] Recent tensions between the RENAMO and the FRELIMO threaten peace in this former Portuguese colony on the Indian Ocean that emerged from conflict twenty years ago. It lies west of a namesake channel.

ANSWER: Republic of **Mozambique** [or *República de Moçambique*]

18. The title character of this work turns into sea foam at the end. For 10 points each:

[10] Name this fairy tale in which the title character gives up her tongue in exchange for becoming human so that she can meet the prince with whom she is in love.

ANSWER: “The **Little Mermaid**” [or “*Den lille havfrue*”]

[10] “The Little Mermaid” was written by this Danish author who also wrote “The Steadfast Tin Soldier,” “The Emperor’s New Clothes” and “The Princess and the Pea.”

ANSWER: Hans Christian **Andersen**

[10] In another Hans Christian Andersen fairy tale, eleven princes are turned into these creatures, and their sister weaves shirts for them to turn them back into humans. Yeats wrote a poem about these creatures “at Coole.”

ANSWER: wild **swans** [or *vilde svaner*]

19. This man led the Prairie School of architectural design and worked from his studio in Taliesin. For 10 points each:

[10] Name this American architect who designed the Imperial Hotel in Tokyo and a spiral-shaped Guggenheim Museum in Manhattan.

ANSWER: Frank Lloyd **Wright** [or Frank Lincoln **Wright**]

[10] This Frank Lloyd Wright-designed building sits over a waterfall on the Bear Run and makes use of cantilevers to extend part of itself over a running creek.

ANSWER: **Fallingwater** [or **Kaufmann** House; or **Kaufmann** Residence]

[10] This motto was coined by Frank Lloyd Wright's mentor, Louis Sullivan. This design principle was later adopted by many modernist architects to justify the lack of ornamentation in their architecture.

ANSWER: "**form** ever **follows function**" [answer must have both underlined parts]

20. The heat capacity of a substance can be defined as the change in this quantity divided by the accompanying change in temperature. For 10 points each:

[10] Name this measure of the total energy of a system, calculated by summing the internal energy and the pressure on the system multiplied by its volume.

ANSWER: **enthalpy** [prompt on "**H**"]

[10] This quantity, the standard enthalpy of formation for an ionic compound, is found using the Born-Haber cycle, which calculates the enthalpy change caused by the combination of two elements into an ionic solid.

ANSWER: **lattice energy** [or **lattice enthalpy**]

[10] This quantity is the amount of energy required to remove one electron from an atom. The first type of this quantity increases as one moves to the right of a period because of increasing effective nuclear charge.

ANSWER: **ionization energy** [or **ionization potential**]