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TOSSUPS

1. This process involves a dehydration reaction followed immediately by a hydration to isomerize a molecule, with an aconitate intermediate. The conversion of succinate to fumarate in this process creates two molecules of FADH₂, which transfer electrons to ubiquinone, and this process creates a single molecule of GTP. Its input is bound to oxaloacetate after a namesake dehydrogenase complex converts it to (*) acetyl-CoA (co A). This process creates two molecules of CO₂ and four molecules of NADH, which are passed off to the electron transfer chain. For 10 points, name this metabolic cycle that uses pyruvate generated from glycolysis.

ANSWER: Krebs cycle [or citric acid cycle; accept tricarboxylic acid cycle; prompt on "respiration"]

2. One ghost town in this state is home to an underground coal mine fire that has been constantly burning since 1962. In 1858, four decades before the Texas Oil Boom, this state's town of Titusville became home to America's first commercial oil drill. In 1889, the South Fork Dam collapsed in this state, killing over 2000 people in the catastrophic (*) Johnstown Flood. In 1892, several hundred Pinkertons unsuccessfully attempted to travel on the Monongahela (muh-nawn-gah-HAY-luh) River in this state to break a strike at Andrew Carnegie's Homestead Steel Works. For 10 points, name this state home to Pittsburgh.

ANSWER: Pennsylvania [or Commonwealth of Pennsylvania]

3. The vertical growth of these objects can be limited by the presence of conditional instability. One form of these objects can form mesocyclones, which rotate along the path of an updraft. Orographic lift can form lenticular examples of these objects, which are classified with a system of prefixes and suffixes. Radiative cooling can lower an air mass below the (*) dew point to create a particularly low-lying type of this object. These objects are labeled nimbus if they produce rain. For 10 points, name these floating objects made of condensed water that are often white and fluffy.

ANSWER: clouds [prompt on "thunderstorms", "hurricanes", and other storms]

4. A poem about a "dapple-dawn-drawn" one of these animals marvels about "the achieve of; the mastery of the thing!" Yeats wrote about seeing "nine-and-fifty" ones of these animals at the estate of Lady Augusta Gregory, which Thomas Hardy contemplates while leaning upon a "coppice gate." A speaker wonders "Do I wake or sleep?" in a poem addressed to one of these animals that begins "A (*) drowsy numbness pains my sense as though of hemlock I had drunk." This animal is the subject of a poem that begins "Hail to thee, blithe Spirit" by Percy Bysshe Shelley. For 10 points, Keats wrote an "Ode" to what type of animals that includes nightingales?

ANSWER: birds [accept "The Windhover" or "The Wild Swans at Coole" or "The Darkling Thrush" or "To a Skylark" or "Ode to a Nightingale"; accept falcons or swans or skylark; accept nightingale before mention; all poems/birds in the tossup are listed in this answerline in order, do not accept any other specific type of bird]

5. It's not Cleveland, but over 9 million square feet of this city's downtown has been purchased for development by Dan Gilbert, the billionaire founder of Quicken Loans. In November 2014 an \$800 million dollar "grand bargain" was negotiated so that this city's Institute of Arts wouldn't have to sell off artwork for budgetary purposes. In March 2013 the lawyer Kevyn (*) Orr was appointed as its emergency manager by governor Rick Snyder. In December 2014 this city exited a 17-month period of bankruptcy. For 10 points, name this Michigan city, a former center of the auto industry.

ANSWER: Detroit

6. This composer's Flute Concerto No. 2 is a reworking of his Oboe Concerto in C major, which begins with an Allegro aperto movement like his *Turkish* Concerto. This composer's final symphony ends with a fugal coda in five voices. An F major Andante second movement is often excerpted from his Piano Concerto No. 21, nicknamed for its use in the film (*) *Elvira Madigan*. One of his symphonies is called "little G minor" to distinguish it from his Symphony No. 40, the "great G minor." His last symphony is in C major and is titled for the head of the Roman pantheon. For 10 points, name this Austrian composer of the *Jupiter* Symphony.

ANSWER: Wolfgang Amadeus Mozart

7. The Taylor Rule dictates how much this quantity should change in response to changing economic conditions. The relationship between two versions of this quantity are shown by the Fisher equation. This quantity is represented by the vertical axis of the IS-LM model. A country is caught in a liquidity trap when the central bank cannot (*) lower this quantity any further because its nominal form is already at zero. A decrease in this macroeconomic rate will result in increased borrowing and thus increased investment. In everyday life, this rate can be either simple or compound. For 10 points, name this rate that determines how much additional money a bank gets back when it lends to a borrower.

ANSWER: interest rate [accept specific answers such as nominal interest rate or real interest rate or federal funds rate; prompt on "rate of return" or "return on investment" or similar descriptive equivalents]

8. This philosopher wrote an essay in which Laelius recalls his friendship with the late Scipio Aemilianus, titled *De Amicitia* (ah-mee-KEE-tee-ah). This lawyer defended his friend Milo during the trial for the murder of the *popularis* politician Clodius Pulcher on the Appian Way. During his consulship, this politician put down the Second Catiline ("CAT"-eh-"line") Conspiracy. After he delivered fourteen (*) speeches called the *Philippics* to the Roman Senate, he was proscribed as an enemy of the state by the Second Triumvirate and assassinated on the orders of Mark Antony. For 10 points, name this most famous orator of the late Roman Republic.

ANSWER: Marcus Tullius Cicero

9. This molecule was found to be the transforming factor in Griffith's experiments on pneumonia by the later Avery-McLeod experiment. Fixed ratios between subunits of this molecule were established by Chargaff's first rule. The lab of Maurice Wilkins produced photograph 51, which gave insight to the structure of this molecule thanks to x-ray crystallography by (*) Rosalind Franklin. The first physical model of this molecule correctly placed its phosphodiester bonds outside its antiparallel structure. For 10 points, name this building block of the genetic code, whose double helix was discovered by Watson and Crick.

ANSWER: DNA [or deoxyribonucleic acid; do not accept RNA or ribonucleic acid]

10. In one of this author's plays, Nancy and Charlie lie on their backs to show submission to the talking lizards Leslie and Sarah, who are scared by the sound of airplanes. One of this playwright's characters had a "hysterical pregnancy" and spends much of the play she appears in throwing up in a toilet after drinking too much. This author of *Seascape* wrote a play about Jerry approaching Peter on a park bench in (*) Central Park as well as a play about Nick and Honey drinking and playing games like "Get the Guest" with George and Martha. For 10 points, name this author of *The Zoo Story* and *Who's Afraid of Virginia Woolf?*

ANSWER: Edward Albee [or Edward Franklin Albee III]

HALFTIME

11. This policy was first enacted after D.F. Malan's National Party unexpectedly won a parliamentary majority in 1948. This policy evicted thousands of civilians from neighborhoods such as Sophiatown and District Six. A series of self-governing "Bantustans" (BAHN-too-stahns) were created through this policy, which limited freedom of movement through the "pass laws." Protestors against this policy were killed by police in the 1960 (*) Sharpeville Massacre and 1976 Soweto Uprising. It was opposed by the African National Congress, which included Nelson Mandela. For 10 points, name this system of racial segregation in South Africa.

ANSWER: apartheid [prompt on less-specific answers such as "segregation" or "racial discrimination"]

12. At the start of this poem, the speaker has drawn open a curtain, as he discusses the "spot / Of joy" on the title person's cheek. The events of this poem take place while the speaker is negotiating a dowry with representatives of the Count. Its speaker declares "I choose / Never to stoop" after complaining that the title person failed to fully appreciate his "gift of a (*) nine-hundred-years-old name." This poem's speaker resents the title noblewoman because she had a heart "too soon made glad." An arrogant nobleman discusses a painting of his former wife in, for 10 points, what poem by Robert Browning?

ANSWER: "My Last Duchess"

13. Although it's not France, a man who worked extensively in this country ordered the heretic Michael Servetus to be burnt at the stake. In this country, Heinrich Bullinger became the head of his local church after his predecessor was killed in the Kappel Wars. A man from this country argued for a purely symbolic Eucharist against Martin Luther during the (*) Marburg Colloquy. This country was home to the author of *Institutes of the Christian Religion*, who preached predestination and the absolute sovereignty of God. For 10 points, name this country home to Huldrych Zwingli and John Calvin, who headed its churches at Zurich and Geneva.

ANSWER: Switzerland [or Swiss Confederation; or Schweizerische Eidgenossenschaft; or Confédération Suisse; or Confederazione Svizzera; or Confederaziun Svizra; or Confoederatio Helvetica; or Helvetia; or CH]

14. One member of this non-composing profession created *Chopiniana* and arranged a scene in which a poet meets sprites in the forest in *Les Sylphides* (sill-FEED). Agnes de Mille had her big breakthrough in playing this role in Aaron Copland's *Rodeo*. The Moor tapping a coconut in *Petrushka* was arranged by a member of this profession, (*) Michel Fokine. One famous member of this profession designed a "contraction and release" movement pattern in her namesake technique. Sergei Diaghilev trained George Balanchine to be a member of this profession. For 10 points, Martha Graham practiced what profession that involves coordinating dance performances?

ANSWER: dance choreography [accept word forms; prompt on "dancing" or word forms before mention of "dance"; prompt on answers mentioning "ballet"]

15. A group of these creatures go to the house of Chiron in grief, leading Chiron to make a statue so they can remember their master. One of these creatures used by Cephalus creates a paradox with the Teumessian fox; that one, named Laelaps, was earlier a gift from Zeus to Europa. A jealous Circe turned Scylla into a monster with the heads of six of these animals at her waist. One of these animals named (*) Argos dies on a dung heap after Odysseus returns to Ithaca in disguise. A pack of these animals kill their master Actaeon after he is turned into a stag. For 10 points, what fluffy, loyal pet represents the star Sirius?

ANSWER: dogs [accept hounds]

16. Many members of this political party became known as "doughfaces" because they were seen as disloyal to their states. During the 1830s the Locofocos emerged as a pro-*laissez faire* faction of this political party. It supported weaker government institutions such as the Independent Treasury, and *opposed* Henry Clay's (*) American System. In the 1860 presidential election, its southern faction nominated John C. Breckinridge, while its northern faction nominated Stephen Douglas. For 10 points, name this American political party whose members included Andrew Jackson.

ANSWER: Democratic Party

17. This quantity can be minimized in the case of zero pressure difference, forming a minimum surface according to the Young-Laplace equation. The Marangoni effect can increase stability by causing movement along gradients in this quantity, which is defined as the change in Gibbs free energy per unit area. The formation of a concave (*) meniscus can result in negative values for this quantity, which can be reduced by surfactants like soap. For 10 points, name this quantity that describes the intermolecular forces at the boundary of a fluid and is responsible for holding together droplets of water.

ANSWER: surface tension

18. This author wrote a play in which the setting breaks down and fades away as the title ruler comes to terms with his death. In a play by this author, several patrons of a café repeat the phrase "Well, of all things!" shortly before a logician proves Socrates is a cat because all cats die. The Old Man and Woman scream "Long live the Emperor!" and jump out of a window in a play by this author of (*) *Exit the King*. This author of the *Bérenger Cycle* imagined fascism as an animal randomly stampeding through a town. Every character eventually transforms into that title animal in a play by this author. For 10 points, name this absurdist Romanian author of *The Chairs* and *The Rhinoceros*.

ANSWER: Eugène Ionesco [or Eugen Ionescu]

19. Two million people protested this country's rule by forming a 400 mile-long human chain during the so-called Singing Revolution. In this country, the reactionary August Coup of 1991 was foiled after a prominent politician stood on a tank to rally the people in front of its parliament. The Commonwealth of Independent States was founded after the collapse of this country. During the 1980s, this country ended its war in (*) Afghanistan and liberalized its government and society via the policies of *perestroika* ("pair"-uh-STROY-kuh) and *glasnost* (GLAZ-nahst). For 10 points, name this Communist state that ceased to exist in 1991, ending the Cold War.

ANSWER: Soviet Union [or U.S.S.R. or Union of Soviet Socialist Republics; prompt on "Russia"]

20. An unconventional genre painter from this country depicted the title bloody carcass held up in *The Ray*. An artist from this country, who was fond of "three pencils" sketches in black, red, and white, painted two versions of a scene distinguished by a group of cherubs around a ship's mast, as lovers either board or depart from the title island of Aphrodite (af-roh-"DIE"-tee), in *The* (*) *Embarkation to Cythera*. Another of this country's artists depicted three statues of putti (poo-tee) in a lush forest scene in which a woman dressed in pink kicks off a slipper on the title conveyance in *The Swing*. For 10 points, name this country of Jean-Baptiste Chardin, whose frivolous Rococo movement included Jean-Antoine Watteau and Jean-Honore Fragonard.

ANSWER: Kingdom of France

END OF REGULATION, PROCEED ONLY IF TIED

21. One example of this procedure is the Winkler test, which uses EDTA on manganese. This procedure displays multiple points of inflection when performed on a polyprotic substance. The graph of this procedure can be shifted horizontally by changes in concentration, and can be examined to determine the dissociation constant of a substance. This procedure can be performed on an excess of (*) reagent in its back form and the equivalence point can be shifted upwards when a weak acid is reacted with a strong base. For 10 points, name this common laboratory procedure that makes use of a burette to determine the concentration of an unknown substance.

ANSWER: titration [or titrimetry; or volumetric analysis]

22. One of this author's poems discusses a man who "studied violin like Latin, because he liked it," Harold Wilson. In that poem by this author, Mary and Warren discuss what to do with their ex-employee Silas. In another of this author's poems, the speaker says that he is "overtired. / Of the great harvest I myself desired." This poet of "The (*) Death of the Hired Man" predicts that he will tell a story later with a "sigh... ages and ages hence" in another poem. In that poem, this author notes that a path was "worn... really about the same" while observing "Two roads diverged in a yellow wood." For 10 points, name this author of "After Apple-Picking" and "The Road Not Taken."

ANSWER: Robert Frost [or Robert Lee Frost]

BONUSES

1. Universal versions of these compounds are made from mixing a number of ones with different effective ranges. For 10 points each:

[10] Name these compounds, which exchange protons with their environment to induce color-changing shifts in their structure. Anthocyanins, a class of natural ones, can be derived from red cabbage.

ANSWER: acid-base **indicator** [accept universal **indicators**; accept, but do not reveal, pH **indicators**]

[10] Indicators detect this value, which is the concentration, or "power", of hydrogen ions in solution. It differentiates acids from bases.

ANSWER: **pH** [or **power of hydrogen**; do not accept pOH]

[10] The dissociation constant of this compound at 25° C is used to convert between pH and its cousin pOH, and usually takes on the value of 10 to the power of -14.

ANSWER: **water** [or **H₂O**; accept **dihydrogen monoxide**]

2. Answer the following about the Roman emperor Tiberius, for 10 points each:

[10] Tiberius succeeded this first Roman emperor, the adopted son of Julius Caesar.

ANSWER: **Augustus** [or **Octavian**; or Emperor Caesar Divi Filius **Augustus**; or Gaius Julius Caesar **Octavianus**; or Gaius **Octavius** Thurinus]

[10] Later in his reign, Tiberius essentially gave up governing the Roman Empire and instead retired to this Mediterranean island, where he supposedly engaged in moral depravities.

ANSWER: **Capri** [or **Capreae**]

[10] About a decade into his retirement, Tiberius was smothered to death by Macro, a prefect who led this force of bodyguards tasked with defending Roman emperors.

ANSWER: **Praetorian Guard** [or **praetoriani**; or **cohors praetoria**]

3. When a whale dies, its carcass brings large amounts of nutrients to this otherwise desolate location in a namesake "fall." For 10 points each:

[10] Name this location. It covers 71% of the Earth and lies at an average depth of 2 miles.

ANSWER: **seafloor** [accept **bottom of the ocean** or other descriptive answers; prompt on "ocean" or "Davy Jones' locker"]

[10] These unique habitats at the bottom of the ocean were discovered by the submersible Alvin, which was almost melted by their extremely high temperatures. They support communities of giant blood-red tube worms.

ANSWER: **hydrothermal vents** [or **thermal vents** or **deep-sea vents**; accept **black smokers** or **white smokers**; prompt on "vents" or "smokers"; do not accept cold seeps]

[10] This term refers to a region of the pelagic zone between 4,000 and 6,000 meters in depth, where sunlight is first unable to penetrate. Colloquially, this term refers to region that appears to be incredibly deep or even bottomless.

ANSWER: **abyssal** zone [prompt on aphotic zone or twilight zone]

4. This poem features a dice game between Death and Life-in-Death, and it ends with the protagonist telling the Wedding-Guest "he prayeth best, who loveth best all things both great and small." For 10 points each:

[10] Name this poem in which the title character shoots an albatross, after which he declares "water, water everywhere, nor any drop to drink."

ANSWER: "The **Rime of the Ancient Mariner**"

[10] This man wrote "The Rime of the Ancient Mariner," as well as a poem about a "stately pleasure-dome" in Xanadu, "Kubla Khan."

ANSWER: Samuel Taylor **Coleridge**

[10] This poem, part of Coleridge's Conversation Poems, describes a "cradled infant" sleeping while the title phenomenon performs "its secret ministry."

ANSWER: "**Frost at Midnight**"

5. Answer the following about surfing spots throughout the United States, for 10 points each:

[10] This famous offshore location in Northern California is one of the few places in the continental U.S. suitable for "big wave" surfing. Version 10.9 of the Mac OS X operating system is named after this location.

ANSWER: Mavericks

[10] The iconic Banzai Pipeline is a surf reef break on the North Shore of this Hawaiian island, whose South Shore is home to the more tourist-friendly Waikiki Beach and the state capital of Honolulu.

ANSWER: Oahu

[10] In the extreme sport of "glacier surfing", surfers ride the waves created through this process, by which massive chunks of ice break off a glacier at its terminus.

ANSWER: calving [accept specific types such as glacier calving or iceberg calving or ice calving; accept word forms such as calve]

6. The title character of this book is revered by the surly Mrs. Danvers, who terrorizes the narrator of this book. For 10 points each:

[10] Name this book narrated by the second Lady de Winter that opens "Last night I dreamt I went to Manderley again".

ANSWER: Rebecca

[10] This Cornish woman wrote *Rebecca* and discussed Mary Yellen and her residence with her uncle, a wrecker named Joss, in *Jamaica Inn*.

ANSWER: Daphne du Maurier

[10] This short story by Daphne du Maurier follows the efforts of the Hocken family to escape from the title murderous avians. Alfred Hitchcock adapted this short story into a movie of the same name.

ANSWER: "The Birds"

7. For 10 points each, answer some things about 20th-century philosopher Karl Jaspers and his concept of "paradigmatic individuals".

[10] This "paradigmatic individual" collected aphorisms in his *Analects* and is the namesake of a school of thought responsible for concepts such as li, ren, and the mandate of heaven.

ANSWER: Confucius [accept Kong Fuzi or Kongzi]

[10] This student of Jaspers published his work on paradigmatic individuals after his death. She coined the phrase "banality of evil" in her work *Eichmann in Jerusalem*.

ANSWER: Hannah Arendt

[10] Jaspers discussed the Axial Age, a 600-year span of civilizational growth credited to religion, in a book about *The Origin and Goal of this topic*. Francis Fukuyama declared that the conclusion of the Cold War represented "The End Of" this topic.

ANSWER: history

8. This ruler promulgated the short-lived religion of Din-i-Ilahi, which combined several faiths together. For 10 points each:

[10] Name this "great" emperor who abolished the jizya tax on non-Muslims in 16th century India.

ANSWER: Akbar the Great [or Abu'l-Fath Jalal ud-din Muhammad Akbar]

[10] Akbar ruled this Muslim empire of India. This empire formally came to an end in 1857 with the capture and exile of Bahadur Shah II during the Sepoy Mutiny.

ANSWER: Mughal Empire [or Moghul Empire; or Mughliyah Saltanat; or Gūrkāniyān]

[10] Akbar was preceded by this father of his, who faced the revolt of Sher Shah Suri and died by tripping on his robe and falling down several flights of steps.

ANSWER: Humayun [or Nasir ud-din Muhammad Humayun]

9. Name these women in the tale of Perseus, for 10 points each.

[10] This mother of Perseus was locked in a vessel and cast out to sea by her father Acrisius. She was then impregnated with a golden shower of light, which turns out to be just Zeus being Zeus.

ANSWER: Danaë

[10] This Ethiopian queen boasted that her daughter Andromeda was more beautiful than the Nereids. In revenge, Poseidon sent the sea monster Cetus to terrorize her land.

ANSWER: Cassiopeia

[10] Medusa and her immortal sisters Stheno and Euryale were known by this name. Athena changed them into ugly monsters after Poseidon raped Medusa in her temple.

ANSWER: Gorgons

10. This composer's second symphony ends with a large choir declaring "Rise again, yes, you shall rise again." For 10 points each:

[10] Name this composer of the *Resurrection* Symphony, whose Symphony No. 5 includes an Adagietto sometimes seen as a profession of love towards his wife Alma.

ANSWER: Gustav Mahler

[10] Mahler's Adagietto is scored for only strings and this tall wooden instrument, whose forty-seven vertical strings are plucked by a seated musician.

ANSWER: harp

[10] Low strings introduce a funeral march based on "Frère Jacques" in the third movement of Mahler's symphony of this number, which it shares with Robert Schumann's *Spring* Symphony.

ANSWER: Symphony No. 1 [or First Symphony; or obvious equivalents; prompt on "*Titan* Symphony"]

11. A few days before the Declaration of Independence was signed in Philadelphia, the Mission Dolores was founded in this modern-day state. For 10 points each:

[10] Name this U.S. state where a chain of 21 Spanish missions was built along a road known as El Camino Real (ell kah-MEE-noh ray-AHL), whose northern terminus was established in Sonoma in 1833.

ANSWER: California [accept Alta California]

[10] This Franciscan friar oversaw the creation of the first nine missions in Alta California. Pope Francis canonized him in September 2015.

ANSWER: Father Junípero Serra (hoo-NEE-pay-roh SER-uh) [or Junípero Serra y Ferrer; or Juníper Serra i Ferrer; or Miquel Joseph Serre i Ferrer]

[10] The first mission in California was established in 1769 in this modern-day port city of 1.4 million people, located just north of Tijuana (tee-WAH-nah).

ANSWER: San Diego

12. Adherents of this religion worship at gurdwaras, which have communal kitchens called langars used to provide free food to all visitors. For 10 points each:

[10] Name this religion whose adherents remember the infinity of God and the unity of their religious community by wearing a steel bracelet called the *kara*.

ANSWER: Sikhism [or Sikh; or word forms]

[10] Sikhism was founded in this modern-day country beginning in the 15th century by a sequence of ten gurus, such as Guru Nanak.

ANSWER: India [or Bharat; or Republic of India; or Bharat Ganarajya]

[10] The practice of *kesb*, or uncut hair, and the aforementioned practice of *kara* are among this number of items worn by Sikhs to outwardly profess their faith.

ANSWER: five [or the Five Ks]

13. A group of people wonder "Since it is her trade, why should she refuse this one more...?" about the woman who holds this nickname. For 10 points each:

[10] Give this nickname of Elisabeth Rousset (**roo-SEY**). In a story titled after this nickname, Rousset is pressured into sleeping with a Prussian officer to allow the passing of a carriage.

ANSWER: **Boule de Suif** [accept "**Ball of Fat**"; accept English translations such as **Dumpling**, or **Butterball**]

[10] "Ball of Fat" is a short story by this author of "Mademoiselle Fifi (**mah-dah-mwah-ZELL fee-fee**). He also wrote a story in which Madame Forester lends Mathilde Loisel (**mah-TEELD lwah-ZELL**) a piece of jewelry that turns out to be fake.

ANSWER: Guy de **Maupassant** [or Henri René Albert Guy de **Maupassant**; accept the pseudonyms Joseph **Prunier**, Guy de **Valmont**, or **Maufrigneuse**]

[10] Guy de Maupassant hails from this country. Another author from this country, Charles Baudelaire, wrote *Les Fleurs du Mal*.

ANSWER: **France**

14. In June 2015 the Los Angeles city council voted to raise this rate to \$15 city-wide. For 10 points each:

[10] In 2012 fast food workers started the nationwide "Fight for \$15" campaign to lobby for an increase in what rate, which is currently \$7.25 an hour at the federal level?

ANSWER: **minimum wage** [accept descriptive equivalents]

[10] In 2014 the minimum wage was raised to \$15 an hour by this major city, whose surrounding area includes the headquarters of tech companies like Amazon and Microsoft.

ANSWER: **Seattle**

[10] In 2014 Chicago increased its minimum wage to \$13 an hour with the support of this Democratic mayor, who has repeatedly battled the city's teachers union.

ANSWER: Rahm **Emanuel** [or Rahm Israel **Emanuel**]

15. In 1905, Albert Einstein published his Annus Mirabilis papers, which contributed much to the field of physics. For 10 points each:

[10] Perhaps the most famous of his Annus Mirabilis papers was on the special form of this theory, which explains the effect of an observer's velocity on observations of space and time.

ANSWER: special **relativity** [do not accept "general relativity"]

[10] The random movement of particles in a fluid as a result of this stochastic phenomenon was explained by Einstein as the macroscopic effect of kinetic molecular theory.

ANSWER: **Brownian motion**

[10] Einstein's paper on this effect won him the 1921 Nobel Prize in Physics. He explained the frequency dependence of this effect as a consequence of discrete energy quanta.

ANSWER: **photoelectric** effect

16. You are a peasant in 14th century England. For 10 points each:

[10] As a peasant, you are tied to your lord's land and work in exchange for his protection, making you one of these people from the lowest class of society.

ANSWER: **serfs** [or **serfdom**]

[10] You live in this type of society where noblemen pledged their allegiance and military support to the king, becoming vassals who were granted plots of land called manors.

ANSWER: **feudal** society [or **feudalism**]

[10] To protest a poll tax instituted in the aftermath of the Black Death, you decide to join Wat Tyler in an unsuccessful 1389 revolt against this English king.

ANSWER: **Richard II** [prompt on "Richard"]

17. Unlike normal cells, whose telomeres shorten, these cells' telomeres are constantly extended by telomerase. For 10 points each:

[10] Name these abnormal cells that reproduce with uncontrolled growth, leading to the rise of malignant tumors.

ANSWER: **cancer** cells

[10] These immortal, widely used cells were derived from cervical cancer cells of an African American woman without her knowledge. These cells were the first human cells to be cloned, and were also used by Jonas Salk in his polio vaccine.

ANSWER: **HeLa** cells [or ***Helacyton gartleri***; accept **Henrietta Lacks**]

[10] Otto Warburg observed that cancer cells got their energy from this metabolic pathway, whose final regulatory step is catalyzed by pyruvate kinase.

ANSWER: **glycolysis** [or **Embden–Meyerhof–Parnas** pathway; or **EMP** pathway]

18. Name these invasive species, for 10 points each.

[10] These large Asian snakes currently threaten the ecosystem of the Florida Everglades.

ANSWER: Burmese **pythons** [or ***Python bivittatus***]

[10] In 1907 the Australian government built a 2000 mile-long fence across the entire continent to keep out these animals, who reside by the millions in central Australia.

ANSWER: European **rabbits** [or common **rabbits**; or ***Oryctolagus cuniculus***; or ***Oryctolaguscuniculus***; accept **bunnies**; prompt on "Leporidae"; do not accept "hares" or "jackrabbits" or "*Lepus*" or "leverets"]

[10] This Japanese species of vines currently plagues the southern United States, where it grows absolutely everywhere.

ANSWER: **kudzu** [or **Japanese arrowroot**; or ***Pueraria montana***; or ***Pueraria lobata***; or ***Puerariaedulis***; or ***Pueraria phaseoloides***; or ***Pueraria thomsonii***; prompt on "arrowroot"]

19. The two foregrounded men in *The Menaced Assassin* wear one of these items, also worn by three nondescript men, each below a crescent moon in *The Mysteries of the Horizon*. For 10 points each:

[10] Name this article of clothing worn by several floating men in *Golconda* and the central figure in *The Son of Man*.

ANSWER: **bowler hats** [prompt on just "hats"]

[10] This Belgian surrealist not only painted a lot of bowler hats, but also eerily blue cloud filled skies such as in his *The Human Condition*. His painting *The Treachery of Images* features the line "This is not a pipe".

ANSWER: René François Ghislain **Magritte**

[10] In Magritte's *The False Mirror*, one of these body parts is shown displaying a cloudy sky. In a violently titled Magritte portrait, these body parts are replaced with female breasts.

ANSWER: **eyes**

20. This author wrote a poem instructing the title man to "Go to the western gate... where the vines cling crimson to the wall." For 10 points each:

[10] Name this author who wrote "Luke Havergal." This author set many of his poems in Tilbury Town.

ANSWER: Edwin Arlington **Robinson**

[10] This other Robinson poem about a hopeless romantic describes a namesake "child of scorn" who "dreamed of Thebes and Camelot."

ANSWER: "**Miniver Cheevy**"

[10] Robinson's poem "Richard Cory" ends on "one calm summer night" when Richard, a "gentleman from sole to crown," performs *this action*. Description acceptable.

ANSWER: "**put a bullet through his head**" [accept descriptive answers such as "**shooting himself**"; prompt on "commits suicide"]

21. For 10 points each, answer the following about trade embargoes throughout world history.

[10] In 2015 Barack Obama began discussions to lift the long-standing American embargo of this Caribbean country that was formerly led by Fidel Castro.

ANSWER: Cuba [or Republic of Cuba or Republica de Cuba]

[10] In the 1970s oil prices in the western world skyrocketed after an embargo was declared by several Arab members of this international organization of oil-producing states.

ANSWER: OPEC [or Organization of the Petroleum Exporting Countries or OPEAC or Organization of Arab Petroleum Exporting Countries]

[10] In 1806 Napoleon issued the Berlin Decree to establish this trade embargo against Britain, which was one of the earliest international embargoes in history.

ANSWER: Continental System [or Continental Blockade]