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Toss Ups:

1. A set of three objects associated with this quantity generate the group SU(2). This quantity interacts with the surrounding lattice in the T1 relaxation time. In a singlet state, the net value of this quantity is zero. The anomalous Zeeman effect can be explained by the inclusion of this quantity whose interaction with the magnetic field can be described by three matrices named for Pauli. Fermions have (*) half-integer values of this quantity that was shown to be quantized when an inhomogeneous magnetic field deflected silver atoms in the Stern-Gerlach experiment. The intrinsic angular momentum of a particle is—for 10 points—what quantity which is plus one-half or minus one-half for an electron?

ANSWER: spin angular momentum [prompt on just angular momentum; accept spin quantum number] <Leo/Ed. JS>

2. A creature from this myth system with a quadruped body with the head of a hawk was called the Axex. The term “Serpopard” is a modern coinage to describe a creature from this myth system with a large cat body and the head and neck of a serpent. The Aani is a baboon-dog hybrid sacred to this myth system’s (*) scribe god. The Uraeus is a upright cobra figure associated with the governmental leaders of this culture. The Medjed fish of this myth system ate the penis of one of its gods after he was dismembered. Other monsters from this myth system include Ammit, the devourer of the dead and the serpent Apep. For 10 points, name this myth system, whose many animal headed gods include Sobek, Hathor, and Thoth.

ANSWER: Ancient Egyptian mythology [accept myths of ancient Egypt] <Taylor/Ed. TH>

3. RANKL induces intracellular oscillations of this ion which also helps activate NFATc1. Ryanodine receptors mediate the release of this ion. Desmosomes are formed when cytoplasmic plaque proteins connect to a protein whose five tandem extracellular repeats act as the binding site for this ion which is released by sperm to induce oocyte activation. Cadherins are dependent on this ion that binds to troponin to begin the (*) muscle contraction cycle. It’s not potassium, but during the cardiac action potential an exchange protein swaps three sodium ions for one of these ions. Parathyroid hormone indirectly causes the release of this ion by promoting the formation of new osteoclasts. For 10 points, name this metallic ion often found in bone.

ANSWER: calcium ion [accept Ca2+] <Jonathen/Ed. JS>

4. At the end of the John Waters film *Multiple Maniacs*, a giant one of these animals attacks Divine. A 2015 film starring Colin Farrell where people attending a getaway program must fall in love or turn into an animal of their choice is named for this animal. Jordan Peterson uses serotonin levels in these animals to explain why human hierarchies exist. On the (*) “Judge Trudy” skits on *The Amanda Show*, dancing types of these animals would be called in at the end of cases. In “Formation,” Beyonce references a chain restaurant named for this animal. For 10 points, name this type of shellfish that partially titles a B-52s song and a chain seafood restaurant where the diner may pick one of these animals out of a tank.

ANSWER: lobster [accept Rock Lobster or Red Lobster or Dancing Lobster] <Taylor/Ed. TH>

5. A poet from this nation wrote the mystical poetry collection *Walled Garden of Truth*, which inspired Nizami’s best known work. A ruler of this land called Mycetes attempts to dispose of the namesake Scythian in the first act of a Christopher Marlowe play. People from this nation title a play which opens with the dream sequence of Empress Atossa while in (*) Susa. A graphic novel set here follows a character whose Uncle Anoosh defects to the USSR and takes place during a war with the bordering Iraq. For 10 points each, name this home country of Marji, who is the central figure of the graphic novel *Persepolis*.

ANSWER: Persia [or Persians; accept Iran] <Peter/Ed. AS>

6. **The Lewiston-Auburn Shoe strike involved several thousand textile workers in this US state. The Revolutionary War Battle of Falmouth took place in what is now this state. The British attempted to annex what would become this state and turn it into the colony of New Ireland in the Battle of Hampden. The (*) Webster-Ashburton Treaty ended a dispute in this state. Border ambiguities between this state and northern neighboring territory led to the bloodless Aroostook War. This state gained statehood in 1820 as a free state alongside Missouri in the Missouri Compromise. For 10 points, name this New England state that was once a part of Massachusetts, which is governed from Augusta.**

ANSWER: Maine <Taylor/Ed. PT>

7. **Description acceptable. A theosophic belief system known for revering figures who perform this action was introduced by Guy Ballard through revelation revealed to him by St. Germain. That sect, named for “Masters” who did this action operates I AM University and The White Eagle Lodge educational institutions. Jewish teaching claims that the Pharaoh's daughter Bithian and Jacob’s granddaughter Serach also did this action, first done by Enoch. Muhammad supposedly did this action at the (*) Dome of the Rock. Pius XII declared ex cathedra that Mary did this activity in an event called The Assumption. The Great Commission was issued immediately before Jesus did this action. For 10 points, name this action in which someone rises into the sky without dying first.**

ANSWER: Ascension [or Translation or Entering Heaven Alive or Assumption before mentioned; accept Rising Into the Sky Without Dying First or similar answers before mentioned] <Brad/Ed. TH>

8. **The most famous literary work about this character was adapted to an opera in three parts by Sergei Taneyev, in which all of the murders occur offstage. In one play featuring this character, his mother has a dream where she breast-feeds a snake. In another play, *this* character undergoes the “Binding Song” while standing trial for his most famous crime; that play opens with this character being tormented by the titular (*) goddesses, the Eumenides. For 10 points, which son of Agamemnon killed his mother, Clytemnestra, in his namesake cycle of plays by Aeschylus?**

ANSWER: Orestes [accept Ὀρέστης; accept *The Oresteia*] <Tracy/Ed. AS>

9. **This quantity’s associated opportunity cost is termed the shoe leather cost in reference to the fact that more walking may be required. Its “expected” form appears in the Fisher equation, implying that the nominal form of a *different quantity* will adjust according to it. This quantity can be controlled through policies such as setting reserve requirements, (*) open-market operations and setting interest rates. This quantity can be measured by dividing real by nominal GDP or by observing price trends in a basket of goods, a standard example being the Consumer Price Index. For 10 points, name this phenomenon, the increase in the general price level of goods and services over a period of time.**

ANSWER: inflation [accept expected inflation] <Yonathan/Ed. AS>

10. **T. M. Knox collected the notes of R. G. Collingwood to publish a work on the *Idea of [this concept]*. Giambattista Vico used the term *corsi e recorsi* to describe his three-stage cyclical model of this concept in his work *The New Science*. Francis Fukayama argued that liberal democracy would emerge as the final form of government after the Cold War in a work about the (*) *End of [this concept]*. In a lecture, Hegel once claimed that Africa did not have this concept because it “lacked development.” For 10 points, George Santayana claimed that “those who do not understand” what discipline would be “doomed to repeat it?”**

ANSWER: history [accept *The Idea of History*; accept *The End of History*] <Alex/Ed. AS>

11. **George P. L. Walker formulated the dispersal index to classify types of these features. Kiyoo Mogi developed the first quantitative model for the deformation of these features. Multicomponent gas analyzer systems and tiltmeters can be used to predict events involving these features. Events involving these features can be classified as Plinian or (*) Strombolian based on their value for the VEI. These features can be broadly classified into composite and cinder cone types. Matter ejected from these features is called tephra. In these features, a conduit connects the central vent to a magma chamber deep underground. For 10 points, name these geological features, which are classified as active, dormant or extinct based on how often they are expected to erupt.**

ANSWER: **volcanoes** [accept shield or composite or cinder cone **volcanoes**; accept strato**volcanoes**; accept **volcanic** eruptions; prompt on mountains] <Taylor/Ed. JS>

12. **An attachment to these objects in ancient China often made use of a pointing doll that always indicated the direction of south. Domitian introduced groups called the Aureata and the Purpurea who used these objects in their work. Allegiances to certain users of these objects among factions like the Blues and the Greens led to the (*) Nika Riots. The quadriga was a variant on this thing, which was used in an event introduced at the 25th ancient Olympic Games. A 1274 BCE battle between the forces of Muwatalli II and Ramses II was the first large engagement using these things in warfare. The Battle of Kadesh saw the employment of—for 10 points—what ancient mode of transportation which was raced at the Hippodrome and the Circus Maximus?**

ANSWER: **chariots** [accept **quadriga** before mentioned; prompt on carriage; prompt on horse by asking “what is the horse drawing?”] <Taylor/Ed. PT>

13. **Composers like Unto Mononen and Olavi Virta composed many standards used in the Finnish variety of this dance, which became immensely popular in Europe starting in the 1910s. These dances usually begin in a minor key, feature an eight-bar chord structure, and are usually in 2/2 or 4/4 time. Partners in this dance style alternate between long, smooth steps and brief choppy steps. Partners in this style of dance hold each other in closed position and (*) Astor Piazzolla composed many pieces of music used in this style of dance. Usually featuring the bandoneon accordion, this is—for 10 points—what style of dance that first developed in the late 19th century in the slums of Uruguay and Argentina?**

ANSWER: **tango** [accept **tango nuovo** or Finnish **Tango** before mentioned; accept creole **tango**] <Taylor/Ed. TH>

14. **A man in this position was depicted as a chameleon in a political cartoon due to his ideology of "Transformism" being associated with corruption and weak coalition politics. The resignation of one person in this position led to crowds singing the “Hallelujah” portion of Handel’s *Messiah* and dancing outside the Quirinal Palace. Aldo Moro, who held this position, ceded the region of (*) Trieste to the Tito government of Yugoslavia in 1974. One man in this position signed the Treaty of Wuchale that promised support to Emperor Menelik II’s government, but that agreement was null after that man declared war against Ethiopia in the 1890s. Following a loss at Caporetto, Vittorio Orlando succeeded Paolo Boselli in this position during the last years of World War I. For 10 points, name this political leader who resides at Palazzo Chigi in Rome.**

ANSWER: **Prime Minister of Italy** [or **PM of Italy**] <Peter/Ed. PT>

15. **A Joan Miro painting depicts a figurine of one of these animals atop a piano. That painting is titled for one of these animals, a pipe, and a red flower. The most well known painting by Rosa Bonheur shows a group of these animals at a fair. A goat-faced man appears in an Albrecht Durer engraving with one of these animals in its foreground. The original cast of a sculpture of one of these animals resides in the Oval Office. Leland Stanford hired (*) Eadweard Muybridge to conduct a study of the motion of these animals. Frederic Remington’s sculpture *Bronco Buster* depicts one of these animals. Muybridge’s study proved—for 10 points—that which animal lifts all four legs off the ground at once while galloping?**

ANSWER: **horses** [accept *Equus ferus caballus*] <Chandler/Ed. TH>

16. **This novel describes a group of people with pneumothorax who join together to form the “Half-Lung Club.” Hofrat Behrens convinces the protagonist to continually delay his departure from the title location of this novel. Leo Naptha and Ludovico Settembrini’s debates in this novel lead them to duel one another, but one of shoots himself and the other shoots in the air. (*) Clavdia Chaudat becomes the object of affection of this novel’s protagonist, and he successfully pursues an affair with her. The protagonist of this novel sets off to visit his cousin, Joachim Ziemssen, who is in the title location due to his tuberculosis. Hans Castorp spends seven years in the title sanatorium in—for 10 points—what novel by Thomas Mann?**

ANSWER: **Magie Mountain** [or *Der Zauberberg*] <Alex/Ed. AS>

17. This region, known by ancient denizens as the “Mining Country,” may have received its modern name from a god who rode a winged bull and had a beard made of lapis lazuli. Pompey was murdered in one city in this region while a waterway built by Necho was later converted into “Trajan’s River.” In modern history, this region was the target of Operation (*) Badr to seize the Bar Lev Line, occurring simultaneously with another Islamic nation’s attempt to conquer the Golan Heights during the Yom Kippur War. Anwar Sadat allowed another nation to traverse this peninsula navally through a canal after signing its namesake “Disengagement Act.” For 10 points, name this peninsula that acts as a land bridge between Africa and Asia in the nation of Egypt.

ANSWER: Sinai Peninsula [accept Arabia Petraea; prompt on Egypt] <Peter/Ed. PT>

18. The opening section of the first movement of Tchaikovsky’s *Piano Concerto Number 1* is in this time signature. Another piano piece in this time signature begins with the eighth-note sequence A flat, G, A flat, C, B flat and is intended to evoke the image of a dog chasing its tail. That Chopin piece with this time signature is partially titled (*) “Minute,” and another piece in this time signature evokes the flow of the title river, the “Blue Danube.” Most of the output of Johann Strauss II was in this time signature. For 10 points, name this time signature, also known as waltz time, which has one fewer beats per measure than common time.

ANSWER: 3/4 [“three-four”; accept triple time; accept triple meter; accept waltz time before “waltz” is read, prompt afterward] <Alex/Ed. TH>

19. In one poem, this poet describes a grave robber who “spies / A bracelet of bright hair around the bone” which the speaker hopes will make the robber think “there a loving couple lies.” In another poem, this poet of “The Relic” asks a lover “hast thou since / Purpled thy nail in blood of innocence?” after describing a creature inside which “our two (*) bloods mingled be.” Another poem by him closes with the speaker telling a lover “Thy firmness makes my circle just / And makes me end, where I begin” after comparing her to a compass in an extended conceit. For 10 points, name this English metaphysical poet of “The Flea” and “A Valediction: forbidding Mourning.”

ANSWER: John Donne <Taylor/Ed. AS>

20. The MSV potential is used to model compounds named for this chemist, examples of which include diatomic argon. The r to the minus 6 term in the Lennard-Jones potential corresponds to phenomena named for this chemist who also put forth the concept that all gases that are in a reduced state should exhibit the same behavior. This formulator of the law of (*) corresponding states also names an equation of state whose inaccuracies can be fixed using Maxwell’s equal area rule. A quantity named for this chemist is defined as half the distance between the centers of two nonbonded atoms of the same element. Forces named for this chemist include Debye forces and London dispersion forces and allow geckos to stick to walls. For 10 points, name this chemist whose namesake equation is a modification of the ideal gas law that includes ‘a’ and ‘b’ parameters.

ANSWER: Johannes Diderik van der Waals <Jonathen/Ed. JS>

Bonuses:

1. Answer the following about the short fiction of Flannery O'Connor, none of which have anything to do with "A Good Man is Hard to Find." For 10 points each:

[10] Lucynell and Mr. Shiftlet get married in this O'Connor short story, which takes its title from a message beginning "Drive Carefully" on a road sign.

ANSWER: "The **Life You Save May Be Your Own**"

[10] In O'Connor's story "Everything That Rises Must Converge," Julian's mother is reprimanded for attempting to give one of these objects to an African-American child.

ANSWER: a **penny** [prompt on coin; prompt on money]

[10] Flannery O'Connor hailed from this U.S. state. John Berendt's *Midnight in the Garden of Good and Evil* takes place in this southern state's city of Savannah.

ANSWER: **Georgia** [or **GA**] <Alex/Ed. AS>

2. In 2012, Marilyn Hagerty posted a bizarre review of this chain's Grand Forks, North Dakota location. For 10 points each:

[10] Identify this casual Italian restaurant chain where you can gorge yourself on unlimited soup and salad. You could also try this chain's incredibly disgusting "Loaded Pasta Chips."

ANSWER: **Olive Garden**

[10] Olive Garden is operated under this largest restaurant conglomerate in the United States. This conglomerate also operates the criminally underrated Yard House chain.

ANSWER: **Darden**

[10] Olive Garden's biggest Italian restaurant competitor for a while was this one operated by Bloomin' Brands. To compete with Olive Garden, this restaurant offers \$10 pizza and \$5 glasses of Sangria every Wednesday of the year.

ANSWER: **Carrabba's** <Zach/Ed. TH>

3. These objects partially title a 2003 novel Khaled Hosseini. For 10 points each:

[10] Identify these objects flown in the air by Hassan and Amir as they navigate daily life under the Taliban in that work.

ANSWER: **kites** [accept *The Kite Runner*]

[10] Sam talks to Willie about kites in this 1950 play in which several characters prepare for a ballroom dance competition. A scene in this play features a discussion on whether the Koran is as violent as the Bible.

ANSWER: "**Master Harold"... and the Boys**"

[10] "*Master Harold"... and the Boys* was written by Athol Fugard, a playwright from this country. Fugard's play *Blood Knot* directly criticized this country's Apartheid policies

ANSWER: **South Africa** <Zach/Ed. AS>

4. The story of the legendary Christian martyrs of Barlaam and Josaphat are based on the life of this man, who is more associated with another religion. For 10 points each:

[10] Name this Brahmin who, after leaving home in search of enlightenment, reached nirvana and samadhi while meditating under a Bodhi tree. His teaching were transmitted orally and were eventually written down to form the Pali Canon.

ANSWER: The **Buddha** [or either underlined portion of **Siddhartha Gautama**]

[10] In what is thought to be his first sermon, the Dhamma-cak-kappa-vatta-tana, Gautama outline this central Buddhist doctrine, which states that life is suffering and caused by attachment, and the only way to escape suffering is to cease attachment.

ANSWER: The **Four Noble Truths**

[10] This third sermon by Gautama discusses the achievement of liberation from suffering through detachment from the five senses and the mind. In it, he warns of the "burning" of passion and delusion which affect the senses.

ANSWER: The **Fire** Sermon Discourse [or **Ādittapariyāya Sutta**] <Taylor/Ed. TH>

5. The Hoboken catalogue is the standard catalog of this composer's works. For 10 points each:

[10] Name this Austrian composer who wrote oratorios named for *The Seasons* and *The Creation*. His set of six Paris symphonies feature entries nicknamed *The Hen* and *The Bear*.

ANSWER: Joseph **Haydn**

[10] Haydn is often called the father of this chamber genre, which features two violins, a viola, and a cello.

ANSWER: **string quartet**

[10] Haydn's string quartet number 63 in B flat major is nicknamed for this phenomena. A piece by a different composer features an ascending C-G-C motif in the brass is named for this natural phenomena.

ANSWER: **sunrise** [or **dawn**; or **daybreak**; accept **nature**; prompt on just the **sun**] (The second clue is from Strauss's *Also Sprach Zarathustra*) <Taylor>

6. A leader of this country made the statement "Today is the case of the grasshopper against the elephant. But tomorrow the elephant will have its guts ripped out." For 10 points each:

[10] Name this modern day country that was lead by the aristocrat Le Loi in resistance against the Ming dynasty in the 15th century.

ANSWER: **Vietnam**

[10] The elephant and grasshopper analogy was applied to the French by this much later Vietnamese Communist leader who led the Viet Minh resistance movement starting in 1941. He names the current largest city in Vietnam.

ANSWER: **Ho** Chi Minh

[10] This Vietnamese dynasty was the last to rule before Vietnam became Indochina under French colonial rule upon the abdication of emperor Bao Dai. It followed the short lived Tay Son dynasty.

ANSWER: **Nguyen** Dynasty <Taylor/Ed. PT>

7. For 10 points each, answer the following about the Laffer Curve:

[10] The curve was reportedly initially sketched on one of these things at a dinner attended by Donald Rumsfeld and Dick Cheney.

ANSWER: a cocktail **napkin**

[10] The curve was named by Jude Wanniski, a writer for this financial newspaper named for a New York City location.

ANSWER: **Wall Street Journal** [or **WSJ**]

[10] In contrast with the predictions illustrated on the Laffer Curve, Hauser's Law states that the tax revenues postwar America have consistently been approximately this percentage of the GDP each year. Answers within 3 percent will be accepted.

ANSWER: **19.5%** [accept **anything between 16.5% and 22.5%** inclusive] <Alex/Ed. AS>

8. This theorem is true over the real numbers because they form a connected topological space. For 10 points each:

[10] Name this theorem which states that a continuous function in a closed interval attains every value between the image of the boundaries of the closed interval.

ANSWER: **I**ntermediate **V**alue **T**heorem

[10] A special case of the IVT is Bolzano's theorem, which states that a continuous function that changes sign in some closed interval must attain this value. This is the cardinality, or the number of elements, in the empty set.

ANSWER: **zero**

[10] The Heine-Borel theorem states that for closed and bounded subsets of the real numbers have this property. A similar result named for Bolzano and Weierstrass says that subsets of the real numbers have the sequential form of this property if and only if they are closed and bounded.

ANSWER: **compactness** [accept sequentially **compact**] <Leo/Ed. JS>

9. This political party formed in 2001 through a merger of the Fatherland-All Russia and the Unity parties. For 10 points each:

[10] Name this Russian political party that presently controls about 75% of the Duma. It is usually described as a non-ideological "party of power," though its stated ideology is "Russian Conservatism."

ANSWER: **United Russia**

[10] United Russia first rose to prominence by backing this current president of Russia, who formerly led the party.

ANSWER: Vladimir **Putin**

[10] The second most represented party in the Duma is this party. Its leader Gennady Zyuganov has come in second each of the four times he has run for president.

ANSWER: **Communist** Party of the Russian Federation [accept **CPRF**] <Taylor/Ed. PT>

10. This organism's namesake genomic initiative finished sequencing its five chromosomes in 2001. For 10 points each:

[10] Name this model organism, the first plant to have its entire genome sequenced. This weed's small genome and short growth time make it an ideal candidate for genetic experiments.

ANSWER: ***Arabidopsis thaliana*** [accept ***A. thaliana***; accept **thale cress**; accept **mouse-ear cress**]

[10] Experiments with *Arabidopsis thaliana* led to the formulation of the ABC model of the development of these angiosperm reproductive structures, which consist of sepals, stamens, anthers, and petals.

ANSWER: **flowers**

[10] The A, B, and C class of transcription factors in the ABC model control the development of these four concentric structures into the organs of the flower. The first of these structures gives rise to sepals.

ANSWER: **whorls** [or **verticils**] <Taylor/Ed. JS>

11. This book claims that the only way to free ourselves from our passions is to have knowledge of the order of the cosmos established by God in its section "Of Human Bondage." For 10 points each:

[10] Name this book which argues that the substance of nature is God's different "modes." This book begins with a list of definitions and axioms and conclusions derived from them.

ANSWER: ***Ethics, Demonstrated in Geometrical Order*** [by Baruch Spinoza]

[10] To make its arguments more mathematically rigorous, the structure of *Ethics* was based on this Greek author's geometric treatise, *Elements*. He is famous for his 5th postulate about parallel lines.

ANSWER: **Euclid**

[10] This author claimed that Spinoza's definition of god in *Ethics* is merely a description of the world. He defined gravity and electricity as the two components of desire in *The World as Will and Representation*.

ANSWER: Arthur **Schopenhauer** <Leo/Ed. AS>

12. Name these contemporary artists that appear in Campbell McGrath's poem "Pentatona for Five Artists," for 10 points each:

[10] "Ego" is the art of this female postmodern photographer. She depicted herself as a variety of characters in fictional movies in her series *Untitled Film Stills*.

ANSWER: Cindy **Sherman**

[10] "Money" is the art of this second wealthiest living visual artist. This man is known for his steel sculptures of "banal" objects like *Balloon Dog* and *Michael Jackson and Bubbles*.

ANSWER: Jeff **Koons**

[10] "Fire" is the art of Cai Guo-Qiang, an artist from this nation who often uses explosives in his pieces. Ai Wei Wei, another artist from this nation, is known for a performance in which he smashed a Han dynasty vase.

ANSWER: People's Republic of **China** <Taylor/Ed. TH>

13. This poem constantly scolds its author's brother Perses for spending too much time in the marketplace and being generally lazy. For 10 points each:

[10] Name this long didactic poem that lists a series of bizarre superstitions about when in the month to perform certain tasks. It describes the first two races of man as Gold and Silver people.

ANSWER: ***Works and Days*** [or ***Erga kai Hēmerai***]

[10] This ancient Greek predecessor of Homer wrote *Works and Days*, along with describing the rise of Zeus and the lineage of the Greek gods in his *Theogony*.

ANSWER: **Hesiod**

[10] In *Works and Days*, Hesiod claims that life is so hard because of the events caused by Prometheus and this woman. She was given a jar filled with all the world's woes, though it is usually called her "box."

ANSWER: **Pandora** <Taylor/Ed. AS>

14. This man's mother, Basina, left the King of the Thuringii to marry his father since she wanted to "have the most powerful man in the world, even if I have to cross the ocean for him." For 10 points each:

[10] Name this son of Childeric I who converted to Christianity at the end of the 5th century. This king conquered much of Roman Gaul by defeating the Western Romans at the Battle of Soissons.

ANSWER: **Clovis I**

[10] Clovis was a Merovingian King of these German people whose name was synonymous with Western Europeans in the Middle Ages. Other kings include Louis the Pious and Charlemagne.

ANSWER: **Franks** or **Frankish** people

[10] Clovis I allied with this king of the Visigoths who threatened Constantinople while servicing as magister militum for a Western Roman Emperor named Zeno.

ANSWER: **Theodoric** the Great <Peter/Ed. PT>

15. When this character is offered the opportunity to move out from her father's house, she declines by saying "I can think of no happiness without him." For 10 points each:

[10] Name this character, the daughter of Godfrey Cass, who is adopted by the title character of the novel in which she appears. Her name is derived from Hepzibah, her mother and sister's name.

ANSWER: **Eppie**

[10] Eppie appears in this George Eliot novel, which describes the title "weaver of Raveloe's" attempt to rebuild his life after being accused of robbery.

ANSWER: ***Silas Marner: The Weaver of Raveloe***

[10] In *Silas Marner*, Dunstan Cass's skeleton is found with two bags of this substance, which he had stolen from Silas. *Treasure Island* popularized the trope of pirates burying treasure made up mostly of this substance.

ANSWER: **gold** <Leo/Ed. AS>

16. A polity in what is now this country colonized Tobago and called it New Courland, as well as originally colonizing Kunta Kinte island in present day Gambia. For 10 points each:

[10] Name this Baltic state where the Duchy of Courland was once located. It is sandwiched in between Estonia and Lithuania and its biggest cities include Liepaja and Riga.

ANSWER: **Latvia**

[10] Liepaja, Latvia is home to the Karosta Hotel, internationally known because it was formerly one of these places. Residents at the hotel are treated as if they were residents of one of these institutions.

ANSWER: military **prison** [accept Soviet **prison** or Nazi **prison**]

[10] The Latvian city of Daugavpils is home to a former fortress that is now an art center focused on this abstract painter. This color field artist is probably the best known artist of Latvian descent. A chapel dedicated to his work is located in Houston, Texas.

ANSWER: Mark **Rothko** <Taylor/Ed. TH>

17. In addition to its use in chemistry, this equation can be used to model the blooming of cherry blossom trees. For 10 points each:

[10] Name this equation that contains a factor equal to the steric factor times the collision factor. That constant can be found from the y-intercept of plots of this equation which graph log of the rate constant versus one over temperature.

ANSWER: **Arrhenius** equation

[10] The Arrhenius equation shows that the decrease in activation energy caused by these substances leads to an increase in reaction rate. Biological forms of these substances are called enzymes.

ANSWER: **catalysts**

[10] Makosza proposed the interfacial mechanism to explain how this type of catalyst works. Quaternary ammonium salts are an example of this type of catalyst that can facilitate migration from water to an organic solvent.

ANSWER: **phase-transfer** catalyst [or **PTC**] <Jonathen/Ed. JS>

18. The success of this project led to the flourishing of such classically-named cities as Rome, Troy, Ithaca, and Utica. For 10 points:

[10] Name this engineering project completed in upstate New York in the early 19th century. It allowed watercraft to move from its namesake Great Lake near Buffalo to Albany and ultimately down the Hudson River.

ANSWER: The **Erie Canal**

[10] The Erie Canal was referred to as this man's big ditch by detractors. This governor of New York dumped a barrel of water from Lake Erie into the Atlantic Ocean after taking a trip down the length of the canal upon its completion.

ANSWER: Dewitt **Clinton**

[10] The Erie Canal passed through a lake of this name, which shares its name with a perfectionist religious community founded by John Noyes which practiced communal living and complex marriage, and went on to become a major silverware manufacturer.

ANSWER: **Oneida** Lake [or **Oneida** Community] <Taylor/Ed. PT>

19. Grand Unified Theories are models that attempts to unite this force with the electromagnetic force and the strong force. For ten points each:

[10] Name this fundamental force. This force changes the flavors of atoms and is also responsible for its radioactive decay.

ANSWER: **weak** nuclear force [or **weak** interaction]

[10] Neutral current is carried by this neutral boson that does not change flavor or charge. Along with the W bosons, this boson mediates the weak force.

ANSWER: **Z** boson

[10] The hypothetical graviton lacks this quantity, like some other bosons, because gravity is a long range force. The discrepancy between the Planck unit of this quantity and the W and Z bosons' value for this quantity is one description of the hierarchy problem.

ANSWER: **mass** <Leo/Ed. JS>

20. This artist may have included a self portrait as an insect-winged demon in the foreground of his painting *Death and the Miser*. For 10 points:

[10] Name this artist who painted a horde of insectoid angels descending from heaven in the left panel of his *Haywain Triptych*.

ANSWER: Hieronymus **Bosch**

[10] The left of Bosch's *Death and the Miser* shows one of these figures wielding an arrow and peering through a door. Bruegel the Elder depicted some of these figures massacring sinners in *The Triumph of Death*.

ANSWER: spooky **skeletons** [accept **bone** people or equivalents]

[10] Bosch was known for his moralistic paintings like this massive triptych featuring a treeman, a white giraffe and God blessing Adam and Eve, among other strange things.

ANSWER: *The **Garden of Earthly Delights*** <Taylor/Ed. TH>