Tossups

1. This transformation unusually occurs in morphine and its derivatives while they are bound to their receptors, and increasing the barrier to it preferentially leads to antagonist rather than agonist effects. The Walsh diagram for this process shows that the HOMO is destabilized in the transition state by going from being the 2a1 ("two-a-sub-one") orbital to the a2'' ("a-sub-two-double-prime") orbital. The high barrier to this process in bicycloheptane ("bi-cyclo-heptane") derivatives is called the bicyclic effect. This behavior does not occur in Troger's base. The barrier for this behavior is high in phosphines due to phosphorus's bonding orbitals having high p-character. This behavior requires a transition from a C3v to a D3h state. The energy splitting created by it was the basis of the first MASER. This behavior is base-catalyzed in thalidomide, leading to the creation of its teratogenic enantiomer in vivo. For 10 points, name this phenomenon in which a pyramidal molecule, prototypically an amine, flips like an umbrella.
ANSWER: chiral **inversion** [or **nitrogen inversion**; or pyramidal **inversion** or umbrella **inversion**; prompt on **racemization** with "what specific effect causes the racemization?"]

2. This philosopher is, with two later thinkers, one of the namesakes of an "enframing" theory of language contrasted with the HHH theory in Charles Taylor's *The Language Animal*. This thinker argued that a person with no use of language would be unable to discover that the angles of all triangles sum to 180° in a book that claims that names are "marks" used to "bring to mind" the memory of concepts. Margaret Cavendish, who married into the family of this philosopher's patrons, sided with his criticism of Robert Boyle's experimental philosophy but disputed his claim that the passions are "voluntary" motions of the mind. John Wallis attacked this thinker for claiming to have squared the circle in the treatise *De Corpore*, which was part of a planned trilogy with *De Cive*. For 10 points, what philosopher argued that accepting a "sovereign" ends the "war of all against all" in his book *Leviathan*?
ANSWER: Thomas **Hobbes** (Taylor named the "HLC theory" after Hobbes, Locke, and Condillac.)

3. This is by far the most famous of a string of operas that Basil Hood adapted into English for Daly's Theatre. Ernst Lubitsch's final musical film of the 1930s was an adaptation of this opera with lyrics by Lorenz Hart. An aria in this opera is about a woods-maiden who lures a young hunter into her cliff-dwelling. The wife of this opera's composer secured "honorary Aryan" status due to Hitler's love of this opera. In this opera, a woman writes "I'm a respectable wife" on a fan after finding the declaration "I love you" written on it. The "Vilja Song" is from this opera, in which the Pontevedrian Danilo proposes to Hanna when she says that she will lose her inheritance upon remarriage. The invasion theme of Shostakovich's "Leningrad" Symphony quotes the song "You'll Find Me at Maxim's" from this opera. For 10 points, name this operetta by Franz Lehár.
ANSWER: The ***Merry Widow*** [or Die ***lustige Witwe***]

4. In a play by this author, a character begins a monologue with "I could smell the avocado blossoms" while cleaning up wooden shards. A character stares at himself in a windshield in a monologue written by this author that begins "I was gonna run last night." This author created a character who urinates on his sister's posters during an argument over a 4-H project in a play that features a perpetually empty refrigerator. The setting of a play by this man is compared to a Norman Rockwell painting in a scene where a man's head is bloodied after being shaved by his amputee son. Wesley Tate butchers a lamb at the end of one of this author's plays, while in another, a murder by the alcoholic patriarch Dodge is discovered by his son Tilden. For 10 points, name this American playwright who wrote about familial dysfunction in a trilogy consisting of *The Curse of the Starving Class*, *True West*, and *Buried Child*.
ANSWER: Sam **Shepard**

5. This researcher theorized that symptoms of all nervous disorders are caused by lesions either in areas central to a particular function or at "sejunctions" in connective areas in his typological work that built on Wilhelm Griesinger's concept of "psychic reflex." A paper by this researcher first identified the rare "conduction" form of a disorder characterized by difficulty in repeating a key task. With Norman Geschwind, he names a model of processing that distinguished between "perceptual " and "motor" components and drew on his theories advocating functional specialization. Logorrhea is a common symptom of a disorder named for this researcher, which is caused by damage in a structure in the superior temporal gyrus. Language comprehension, but not production, is impaired in the form of aphasia named after, for 10 points, what German neurologist, who also names a language-recognizing "area" in the brain?
ANSWER: Karl **Wernicke**

6. In 1993, troops from this country participating in its Operation Harmony peacekeeping mission were attacked by Croatian forces in the Medak pocket. This country seized a Spanish ship in 1995 to provoke a bloodless conflict called the Turbot War. This country's military budget was reduced after its airborne regiment tortured and killed teenager Shidane Arone in the so-called Somalia Affair. This country's immigration office promoted a tourism campaign with the motto "the Last Best West." In 1963, this country's leadership split over whether to accept nuclear-armed Bomarc missiles after the cancellation of its Avro Arrow fighter. A future leader of this country was prevented by a Soviet veto from becoming the first U.N. secretary-general, but did win a Nobel Peace Prize for negotiating an end to the Suez Crisis. For 10 points, name this country kept out of the Vietnam War by its Prime Minister Lester Pearson.
ANSWER: **Canada**

7. The formation of a speckle-like pattern due to impurities leads to this quantity's namesake "universal fluctuations" during measurement. Quantum dots exhibit regularly-spaced peaks of this quantity because of the Coulomb blockade. In the case of multiple channels, this quantity is proportional to the sum of the channels' transmission eigenvalues by the Landauer formula. A specific value of this quantity exhibits plateaus spaced apart at a distance proportional to the filling factor in the quantum Hall effect. For a bipolar junction transistor, the ratio between the collector current and the base-to-emitter voltage is known as the "transfer" variant of this quantity. The quantum of this quantity equals two times the elementary charge squared over Planck's constant, or equivalently, two divided by the von Klitzing constant. The siemens is the SI unit of, for 10 points, what quantity, the reciprocal of resistance?
ANSWER: electrical **conductance** [accept Hall **conductance**; do not accept or prompt on word forms like "conductivity" or "conduction"]

8. In one book, the father of two sons named Benjie and Jason enters this place by touching a magic stone, after he is saved from a blizzard by a blind man who plays a blue guitar. A legend says that sixty magicians found this place by transforming into animals, and met an old woman here who told them she longed for her son to return to this place where anyone can choose their age. This place had seven caves for seven different tribes, and was called the "land of the white herons." At a "Fisherman's Meeting" organized by the "Crusade for Justice," a manifesto titled for this place was introduced by a boxer nicknamed Corky and supported by the Brown Berets. This legendary place, used as a rallying cry by the Chicano Movement, was departed by its people after they were told to seek an eagle perched on a cactus by Huitzilopochtli. For 10 points, name this ancestral homeland of the Mexica or Aztec people.
ANSWER: **Aztlán**

9. In this novel, the narrator's cousin clashes with her teacher Miss Cutmore, which angers the narrator, who observes that Miss Cutmore taught his cousin the word "colony." That cousin names her daughter after Alexandra Kollontai. Another character in this novel is caned for replacing his teacher's record of *Fantasia on Greensleeves* with "Come Together," and gets a handjob from the narrator in his mother Eva's house. The protagonist of this novel sleeps with a girl whose racist father, whom he calls Hairy Back, shouts "we're with Enoch" at him in a slur-laden tirade. This novel opens with the narrator describing himself as "an Englishman born and bred, almost." The title character of this novel, the protagonist's father, seduces women to whom he teaches yoga during "guru sessions." For 10 points, name this coming-of-age novel about Karim Amir, set in London and written by Hanif Kureishi.
ANSWER: The **Buddha of Suburbia**

10. At 24, this politician gained influence by organizing elevator operators and mailmen to elect him secretary of a Capitol Hill club called the "Little Congress." This politician often tried to build consensus by quoting his favorite Bible verse, "Come now, and let us reason together." Ollie Quayle's polling data led this politician to adopt the term "frontlash" to describe his crossover appeal to moderate voters. He used his physical bulk to threaten and cajole colleagues to pass legislation, in a process known as "the Treatment." The support of his mentor, Richard Russell, enabled him to become Senate majority leader in 1955. He was mockingly called "Uncle Cornpone" by Robert Kennedy, a detail of their feud described in the 2012 volume *The Passage of Power*. The subject of biographies like *The Master of the Senate* written by Robert Caro, for 10 points, name this man who later became U.S. President and launched the "Great Society."
ANSWER: **L**yndon Baines **Johnson** [or **LBJ**; prompt on Johnson]

11. An artist who worked primarily in this city, Giovanni Antonio Bazzi, signed his own paintings with his derogatory nickname, "the Sodomite." A panel that shows Saint Francis renouncing his father in a bright pink courtyard was painted by an artist from this city, who was nicknamed "il Sassetta." This city's Sala della Pace houses a fresco that depicts the sons of Remus as infants at the feet of a seated figure who represents the Common Good. An artist from this city created an altarpiece with 26 depictions of the Passion on the back, and a central panel that portrays saints worshipping an enthroned Virgin and Child against a gold background. The scales of justice appear in a series of frescoes by Ambrogio Lorenzetti located in this city, titled *Allegory of Good and Bad Government*. For 10 points, name this town in Tuscany where the artist of the *Maesta*, Duccio, worked.
ANSWER: **Siena**

12. The medieval princes of Baux claimed to be descended from a member of this group, and referred to his name in their town motto. In the folklore of another country, the immortal witch Befana is said to have begun her wanderings after an encounter with this group. Eastern Europeans traditionally write the first letters of these people's names, separated by crosses, in chalk above their doors for one holiday. In Mexico, children leave their shoes out with hay and a letter addressed to this group. Nicholas of Verdun helped design a gilded reliquary in Cologne Cathedral thought to contain this group's bones. A hidden figurine called a *feve* is baked into an often-ring-shaped "cake" that is named for these people and consumed in many countries. In a carol, these people address a "star of wonder, star of night." For 10 points, name these biblical sages who offered gold, frankincense, and myrrh to the infant Jesus.
ANSWER: the Three **Magi** [or the Three **Wise Men**; or the **Three Kings**; or descriptions of the **kings who visited the baby Jesus**; or **Balthazar, Melchior, and Kaspar**, in any order; prompt on kings]

13. This composer of *Apple Blossoms* transcribed the slow movement of Rachmaninoff's Piano Concerto No. 2 into the piece *Preghiera*. This composer adapted an unused theme from a rejected finale of Beethoven's Wind Octet into a *Rondino on a theme of Beethoven*. A piece by this composer opens with the piano playing perfect fifths and a sprightly pentatonic theme in the violin that was inspired by a visit to the Chinese theater. This composer wrote a set of waltzes, two of which are often used as solo encore pieces; those are *Liebesleid* and *Liebesfreude*. Another piece by this composer opens with twenty-two bars of accented, leaping quarter notes; that showpiece was written "in the style of Pugnani," one of this musician's many pieces deliberately misattributed to older composers. For 10 points, name this Austrian violin virtuoso and composer of *Praeludium and Allegro* and *Tambourin Chinois*.
ANSWER: Fritz **Kreisler**

14. Evelyn Beck argues that this story was the first by its author to adapt techniques from Yitzhak Lowy's gesture-heavy Yiddish theater. The author of this story claimed that the "endless stream of traffic" in its final sentence refers to a "violent ejaculation." In this story, the protagonist relates how a friend saw an Orthodox priest cut a cross into his hand while addressing a crowd in Kiev. An old man in this story exposes his war scar by grotesquely pulling up his nightshirt above his thighs in imitation of the protagonist's fiancee. The protagonist of this story, whose fiancee Frieda shares her initials with Felice Bauer, writes to an unseen friend in St. Petersburg to announce his engagement. In this story, Georg Bendemann commits suicide by jumping off a bridge. For 10 points, Herr Bendemann sentences his son to death by drowning in what story by Franz Kafka?
ANSWER: "The **Judgment**" [or "Das **Urteil**"; accept "The **Verdict**"]

15. Despite a victory outside this city, Royalist forces were unable to capture it because a gunpowder explosion blinded their commander, Sir Ralph Hopton. A temple pediment found at this site of the Battle of Lansdown shows a man's head referred to as the "Gorgon" because it has snakes for hair. London's Apsley House was built from a namesake honey-colored stone that comprises much of this city. Geoffrey of Monmouth wrote that Bladud, the father of Lear, founded this city after he was cured of leprosy when his pigs led him to mud with restorative powers. Many curse tablets were discovered at a site in this city, which was initially named for a Celtic goddess syncretized with Minerva. That site in this city included a caldarium, a tepidarium, and a frigidarium. For 10 points, name this city in Somerset that was once the Roman town of Aquae Sulis, and was named for its hot springs.
ANSWER: **Bath** [accept **Aquae Sulis** before "Aquae Sulis" is read]

16. One version of this protein serves as the donor in the fusion construct Antares. Several versions of this protein act on imidazopyrazinone ("imid-azo-pyraz-inone") derivatives like vargulin. A 19 KDa ("K-D-A") version of this protein was engineered from an *Oplophorus* protein and acts on furimazine; that is its "nano" version. Promega's DLR assay sequentially measures the activity of two versions of this protein to increase sensitivity and dynamic range. This protein is used for an ATP cell viability assay, since many versions of this protein use Mg and ATP as cofactors. *Cypridina* and *gaussia* express versions of this protein that are secreted into the environment. A version of this enzyme that acts on coelenterazine was isolated from *Renilla reniformis*, the sea pansy. Unlike GFP, this enzyme requires a substrate but not a light source. For 10 points, name this enzyme used for bioluminescent reporter assays, which fireflies use to glow.
ANSWER: **luc**iferase

17. This author described himself "shedding tears of water and flame" in a poem whose lines mostly end with the word "candle-like." One of this author's poems opens by describing "last night's wine still singing in my head" and concludes "Life's a riddle – give it up / There is no answer to it but this cup." Another of his poems describes how Joseph's "daily-increasing beauty" entranced Zuleikha and offers "Samarkand and Bukhara" just for the title figure's mole. A frequently-visited domed pavilion is built at the tomb of this poet, who described a youth from his hometown in "Shirazi Turk." Joseph von Hammer-Purgstall's translations of this poet inspired an 1819 collection linked by the concept of cultural exchange; that is Goethe's "West-Eastern" version of his collected works. The Arabic term for memorizing the Quran names, for 10 points, what Persian poet whose ghazals appear in his Divan?
ANSWER: Khwāja Shams-ud-Dīn Muḥammad **Ḥāfeẓ**-e Shīrāzī [or **Hafiz**]

18. This ruler outlined principles for "adhering to austerity" and "watchfulness in government affairs" in a document he distributed to his court called "Record of the Ancestor's Instructions." One of his generals was forced to commit suicide by eating a large amount of goose, to which he was allergic. This ruler praised Muhammad as "the most noble sage" in his Hundred Word Eulogy. After discovering a plot by Hu Weiyong, he abolished the office of chancellor and replaced it with a system of grand secretaries. He took power by using fire ships to win the Battle of Lake Poyang. His grandson and successor Jianwen was quickly toppled by his fourth son, the Yongle Emperor. This peasant leader emerged as the preeminent warlord in the Red Turban rebellion, then assumed the Mandate of Heaven and occupied Dadu in 1368, bringing an end to the Yuan Dynasty. For 10 points, name this first Ming emperor.
ANSWER: **Hongwu** emperor [or **Zhu Yuanzhang**; or **Chu Yuan-chang**]

19. In 1980, Howard and Labonte proposed that this quantity is affected by torsional oscillations, which may be caused by banana-shaped cells. J. F. Donati provided the first reliable determination of this quantity outside of the Solar System by observing the periodically flaring AB Doradus. Entities on the so-called Bartels "music diagram" have varying values for this quantity, which may be due to the result of a meridional flow. The equation "X plus Y times sine squared of psi plus Z times the sine to the fourth of psi" where psi is the angle of latitude provides a rough estimate for this quantity. Christopher Scheiner used sunspots as "tracers" to refute Galileo's wrong claim that this value does not change at the poles or limbs of the Sun. For 10 points, name this quantity, which for the Sun is fastest at the equator, at a value of about one cycle per 26 days.
ANSWER: differential **rotation** rate [or **angular velocity**]

20. In an article titled for his "life in" devices designed by this man, William Burroughs wrote about one of Jean Cocteau's party tricks. The effects of one of this man's devices were attributed to the temperature gradient in the room when tested by Albert Einstein. In *On the Road*, Old Bull Lee asks Sal Paradise if he wants to "put some juice in [his] bones" using a device designed by this man. This man advocated "work democracy" in a book that argued that fear of revolt was anchored in the "character structure" of the German people. He claimed that the family is the "reactionary germ cell" of authoritarianism in that book, *The Mass Psychology of Fascism*. This rogue psychoanalyst designed boxes he called "accumulators" to collect a form of sexually-charged energy from the atmosphere. For 10 points, name this thinker who proposed a life force he called "orgone energy."
ANSWER: Wilhelm **Reich**

Bonuses

1. This figure became worshipped as the "New Asclepius" after protecting believers from a cloud of plague in Antioch in 160 CE. For 10 points each:
[10] Name this ancient snake god whose cult was started by the bogus Greek prophet Alexander of Abonoteichos, who was ridiculed by Lucian of Samosata as "Alexander the Oracle Monger."
ANSWER: **Glycon** [or **Glykon**]
[10] Zeus took the form of a snake to seduce this mother of Alexander the Great, the fourth wife of Philip II of Macedon, who supposedly slept with snakes that told her divine secrets at night.
ANSWER: **Olympias**
[10] The Roman Emperor Marcus Aurelius facilitated the cult of Glycon by linking them in art to this Roman goddess of the hearth and home, who aided the Lares and Penates in driving off evil spirits.
ANSWER: **Vesta** [accept **Hestia**]

2. The addition of a small amount of solvent in these devices, known as liquid-assisted grinding, can yield very close to 100% reaction conversion in just a few minutes. For 10 points each:
[10] Name these devices used in mechanochemistry, which use steel spheres and high-speed rotation to make and break chemical bonds in the solid state. The "planetary" type of these devices introduces a second axis of rotation to further reduce particle size.
ANSWER: **ball mill**s [accept planetary **ball mill**s; prompt on mills]
[10] Minimizing solvent use in ball milling and mechanochemistry adheres to the first of 12 principles developed by Paul Anastas and John C. Warner in this broad field of chemistry that aims to reduce environmental impact.
ANSWER: **green** chemistry [or **sustainable** chemistry]
[10] This German chemist was the first to class mechanochemistry as a separate branch of chemistry. A spontaneous process named for this chemist is a common cause of nanoparticle sintering due to the thermodynamic stability of larger particles.
ANSWER: Wilhelm **Ostwald**

3. One story set in this town follows the trial and execution of Homer Phelps, while in another a boy stumbles through reading "The Charge of the Light Brigade" during his class's elocution lessons. For 10 points each:
[10] Name setting of the stories "Making an Orator" and "The Angel Child," where a boy destroys a peony in his family's backyard while pretending to drive a firetruck at the opening of a novella.
ANSWER: **Whilomville**, New York
[10] Whilomville is the setting of this novella in which the black coachman Henry Johnson saves the young Jimmie from a house fire, causing the ostracism of the Trescott family when they promise to shelter him.
ANSWER: *The **Monster***
[10] *The Monster and Other Stories* was written by this American author who also wrote "The Bride Comes to Yellow Sky" and "The Open Boat."
ANSWER: Stephen **Crane**

4. Writing an introduction to a 1951 translation of Rosa Luxemburg's *The Accumulation of Capital* likely influenced this scholar to publish a 1956 book of the same title. For 10 points each:
[10] Name this economist who analyzed *Das Kapital* in light of subsequent theoretical developments in 1942's *An Essay on Marxian Economics*.
ANSWER: Joan [Violet] **Robinson** [or Joan Violet **Maurice**]
[10] Book II of Robinson's *The Accumulation of Capital* proposes a post-Keynesian model of accumulation in this time frame. J. M. Keynes himself quipped that, in this time frame, "we are all dead."
ANSWER: **long run** [or **long period**; or **long term**]
[10] Robinson and Piero Sraffa were the major post-Keynesian participants in a mid-20th-century economic "controversy" identified in reference to this geographic name, which coincidentally applied to two different places.
ANSWER: **Cambridge** [accept University of **Cambridge**; accept **Cambridge**, Massachusetts; accept **Cambridge** capital controversy; accept (Two) **Cambridges** debate]

5. This area of Northeast Italy is generally held to be bounded on the west by the Livenza River and on the east by the Julian Alps. For 10 points each:
[10] Name this area, whose medieval traditions were documented in *The Night Battles*. This area's namesake language is sometimes called Eastern Ladin, while some in its east speak Slovene-influenced dialects.
ANSWER: **Friuli**
[10] Friuli is adjacent to this subrange of the Southern Limestone Alps, which has been designated as a UNESCO World Heritage Site and contains the "Three Peaks of Lavaredo."
ANSWER: **Dolomites**
[10] The southern border of Friuli is its coast on this sea, an arm of the Mediterranean which divides Italy from Croatia as well as Bosnia and Herzegovina.
ANSWER: **Adriatic** Sea

6. This man plundered the capital of Musasir in his wars against the Urartu Kingdom. For 10 points each:
[10] Name this monarch who claimed to be the son of Tiglath-Pileser III and restored Assyrian control of Babylon in 710 BC after taking the throne from Shalmaneser V. His son and heir Sennacherib later sacked Babylon.
ANSWER: **Sargon II** [prompt on Sargon]
[10] By capturing its capital of Samaria, Sargon conquered this kingdom and supposedly deported the Ten Lost Tribes of this place. He did not attack this kingdom's southern neighbor, Judah.
ANSWER: Kingdom of **Israel**
[10] Later in his reign, Sargon defeated and exiled this ruler who founded Ecbatana and, per Herodotus, was the first king of the Medes.
ANSWER: **Deioces** [accept **Dia-oku** or **Dēiokēs**]

7. This composer's piece *Wing on Wing*, scored for two sopranos and orchestra, includes recordings of a fish and of Frank Gehry. For 10 points each:
[10] Name this Finnish composer and conductor who recently took the helm as music director of the San Francisco Symphony, starting in the 2020-21 season.
ANSWER: Esa-Pekka **Salonen**
[10] From 1992 to 2009, Salonen was the music director of this city's Philharmonic, which is now conducted by Gustavo Dudamel. This city is home to the Walt Disney Concert Hall.
ANSWER: **L**os **A**ngeles
[10] Salonen conducted the premiere of this John Adams piece commissioned for the grand opening of the Walt Disney Concert Hall. This piece's two movements are *A New Day* and *Sri Moonstone*, and it features a solo six-string electric violin.
ANSWER: The ***Dharma at Big Sur***

8. A failed "Great" one of these campaigns in 1373 led by John of Gaunt saw English forces lose 15,000 while moving from Calais to Gascony. For 10 points each:
[10] Name this type of short raiding campaign, commonly launched by the English cavalry in the Hundred Years' War. This kind of raid focused on pillaging farms and industry while avoiding major cities.
ANSWER: **chevauchée** [or **cabalgada**; or **cavalgada**]
[10] This English prince and eldest son of King Edward III led many chevauchées in the 1350s, including one that ended in the Battle of Poitiers and the capture of John II. He was also the brother of John of Gaunt.
ANSWER: Edward the **Black Prince** [or **Edward of Woodstock**; prompt on Edward]
[10] In a later campaign, the Black Prince defeated Henry of Trastámara at this 1367 battle named for a small Spanish town, fighting on behalf of Peter the Cruel during the Civil War of Castile.
ANSWER: Battle of **Nájera**

9. This woman's article "The English Aristocracy" was the impetus for a collection that features an "Essay in Sociological Linguistics" by Alan Ross. For 10 points each:
[10] Name this author, who also wrote about Fanny's interactions with the Montdores in *Love in a Cold Climate*.
ANSWER: **N**ancy **Mitford** [prompt on Mitford]
[10] Mitford edited this book, which contains an essay in linguistics by Alan Ross that originated the distinction between "U" and "Non-U" English. Peter Fleming wrote an essay for this collection under the pseudonym Strix.
ANSWER: *Noblesse Oblige: An Enquiry Into the Identifiable Characteristics of the English Aristocracy*
[10] *Noblesse Oblige* also includes a letter to Mitford written by this author. Mitford was generally considered one of the "bright young things" satirized by this author in his novel *Vile Bodies*, his follow up to *Decline and Fall*.
ANSWER: Evelyn **Waugh**

10. In a historical context, this term referred to the problem of constructing a square whose area is equivalent to that of a circle. For 10 points each:
[10] Give this term that means computing area, and which is often used in the name of several numerical integration algorithms, such as the Gauss-Chebyshev and Gauss-Kronod ones.
ANSWER: **quadrature**
[10] Quadrature methods are used when the space between functions used for this task is allowed to vary. This task is the construction of a polynomial function to approximate another function using points *within* the function.
ANSWER: **interpolation** [accept word forms like **interpolated**]
[10] In this algorithm, the nodes are chosen at intervals using the formula "cosine of 2pi times divided by the length of the interval." One of its namesakes also names a generalization of Horner's Method for evaluating Chebychev polynomials.
ANSWER: **Clenshaw-Curtis** quadrature

11. Caroline of Ansbach wrote introductions to a series of letters in which this thinker makes the "static shift" and "kinematic shift" arguments. For 10 points each:
[10] Name this German philosopher who defended a relativist theory of space and time in his correspondence with Samuel Clarke, a disciple of this man's rival Newton.
ANSWER: Gottfried Wilhelm **Leibniz**
[10] In a letter to Antoine Arnauld, Leibniz denied the possibility of aggregate bodies by comparing this substance to a flock of sheep and a pair of diamonds. His *New Essays on Human Understanding* compare the mind to this substance in opposition to Locke's "blank slate."
ANSWER: **marble** [prompt on stone; prompt on rock]
[10] Leibniz wrote many letters opposing the materialist thought of Electress Sophia, the sister of this other philosopher. In her letters to Descartes, this princess raised problems for his theory of mind-body interaction.
ANSWER: **Elisabeth**, Princess of Bohemia [or **Elisabeth** of the Palatinate]

12. Answer the following about the 1986 assassination of Olof Palme, for 10 points each.
[10] Palme was the prime minister of this Scandinavian country, and a close friend of its film director Ingmar Bergman.
ANSWER: **Sweden**
[10] Books like *Blood on the Snow* have supported the theory that Palme was killed after an Iraqi ambassador told him the details of this scandal, in which a namesake British manufacturer sent bribes to the government of Rajiv Gandhi.
ANSWER: **Bofors** AB scandal
[10] Olof Palme was murdered a week after he spoke against apartheid at a meeting attended by this man, who was president of the African National Congress from 1967 to 1991. This man allegedly authorized the Church Street bombing in 1983.
ANSWER: Oliver **Tambo** [or O.R. **Tambo**; or Oliver Reginald Kaizana **Tambo**]

13. Kenneth Noland described Morris Louis's cramped studio as a "furnace" of this substance, the fumes of which may have contributed to Louis's fatal lung cancer. For 10 points each:
[10] Name this strong-smelling substance that Marcel Duchamp accused painters of being "intoxicated with." Helen Frankenthaler poured it onto canvases to create misty "soak-stain" paintings like *Mountains and Seas*.
ANSWER: **turpentine** [or $C_{10}H_{16}$; prompt on spirits; prompt on solvents]
[10] Morris Louis mixed Magna paint with turpentine as a member of the Washington, D.C. branch of this abstract style of painting also practiced by Mark Rothko.
ANSWER: **color field** [prompt on Washington Color School]
[10] This American surrealist got so "fed up" with the smell of turpentine that she switched to making soft fabric sculptures like *Nue couchée*. In a self-portrait, she stands in front of a series of open doors with a bizarre winged creature crouched at her feet.
ANSWER: Dorothea **Tanning** (The self-portrait is *Birthday.*)

14. One novel begins with the question "at what precise moment had [this country] fucked itself up?" and follows a man writing for the periodical *La Cronica* about this country's rabies epidemic. For 10 points each:
[10] Name this setting of a novel about Santiago Zavala's conversation with the dogcatcher Ambrosio, the home country of Mario Vargas Llosa.
ANSWER: **Peru**
[10] *Conversation in the Cathedral* was translated into English by this prolific American translator best known for his translation of *One Hundred Years of Solitude* that García Márquez preferred to the original Spanish text.
ANSWER: Gregory **Rabassa**
[10] Rabassa's favorite Vargas Llosa novel is *The Green House*, which won the first award named for Romulo Gallegos, the author of this novel about a Venezuelan ranch owner who is unable to win the love of the graduate lawyer Santos Luzardo.
ANSWER: ***Doña Bárbara*** [or ***Lady Bárbara***]

15. Answer the following about ARTnews magazine's top 10 artworks of the 2010s, for 10 points each.
[10] In 8th place was this performance art piece from 2010, in which Marina Abramovic stayed at the Museum of Modern Art for eight hours a day and stared into the eyes of anyone who wanted to sit across from her.
ANSWER: The *Artist is Present*
[10] In 5th place was Amy Sherald's portrait of this African American woman in a patterned white dress. It was unveiled at the National Portrait Gallery alongside Kehinde Wiley's portrait of this woman's husband.
ANSWER: Michelle **Obama**
[10] ARTnews' top artwork of the past decade was this artist's seven-minute video installation *Love Is the Message, The Message Is Death*, which shows Black experiences set to Kanye West's song "Ultralight Beam."
ANSWER: Arthur **Jafa**

16. In two-body scattering problems, these quantities can be defined as squares of the various incoming and outgoing four-momenta. For 10 points each:
[10] Identify these quantities typically denoted s, t, and u. They are particularly useful in situations where processes can be transformed into other processes via crossing relations.
ANSWER: **Mandelstam** variables
[10] Conveniently, Mandelstam variables remain unchanged under the transformations named for this physicist, which move from one relativistic reference frame to another.
ANSWER: Hendrik Antoon **Lorentz** [accept **Lorentz** transformations]
[10] The cross section for the collision of an electron and a positron is a classic example of an observable with this property. An observable has this property if it is *not* sensitive to the long-time physics of the theory, enabling it to be calculated via perturbative methods.
ANSWER: **infrared safe**ty [or **IR safe**ty; or **IRS**; prompt on safety]

17. An essay that cites this literary project describes its form as "an equivalent to the universe" whose power is comparable to "ancient talismans." For 10 points each:
[10] Name this unfinished conceptual work which occupied the last thirty years of Stéphane Mallarmé's life. Mallarmé intended to design this work so that it could be read backwards and even diagonally.
ANSWER: The *Book* [or Le *Livre*; accept **total book**]
[10] Mallarmé's concept of a "total book" is used to define these texts in one essay. An essay whose title asks, "Why Read" these texts describes them as books which people are always re-reading but never reading for the first time.
ANSWER: the **classics**
[10] The essay *Why Read the Classics?* was written by this Italian author whose own classics include *If on a winter's night a traveler*.
ANSWER: Italo **Calvino**

18. Under leaders like George Durant, this rebellion toppled Albemarle governor Thomas Miller, who escaped from prison in Charles Town and notified the House of Lords. For 10 points each:
[10] Name this 1677 revolt in Carolina against the imposition of the Navigation Acts.
ANSWER: **Culpepper**'s Rebellion
[10] Culpepper was acquitted of rebellion with the help of the Earl of Shaftesbury, the patron of this philosopher who wrote the Fundamental Constitution of Carolina, as well as *An Essay Concerning Human Understanding*.
ANSWER: John **Locke**
[10] This larger Carolina rebellion broke out in 1711 when a namesake Quaker governor refused to yield power to Edward Hyde. The Tuscarora War erupted soon after the collapse of this revolt.
ANSWER: **Cary**'s Rebellion

19. This activity has its origins in the legend of Tamalie, who fell to his death after chasing his wife up a banyan tree. For 10 points each:
[10] Name this annual ritual performed on an island in the South Pacific. In this ritual, men climb a tall wooden tower and attach vines to their ankles before jumping.
ANSWER: **land diving** [or **gol**; or **nanggol**; prompt on diving; prompt on bungee jumping]
[10] Land diving is performed on Pentecost Island, one of the larger islands that make up this South Pacific nation. People in this country perform drill exercises with bamboo rifles to worship an American sailor named John Frum.
ANSWER: **Vanuatu**
[10] Another popular cargo cult in Vanuatu developed around this husband of Queen Elizabeth II after his royal visit to the island in 1974.
ANSWER: Prince **Philip**, Duke of Edinburgh [or the **Duke of Edinburgh**]

20. A paper from PJ Hore et al. recently characterized the protein CRY4 from *Erithacus rubecula*, which has four tryptophan residues that generate radical pairs with FAD. For 10 points each:
[10] Name this sense possessed by pigeons. At one point this sense was believed to be mediated by hematite-containing cells in the beak, but those turned out to be macrophages.
ANSWER: **magnetoreception** [or **magnetoception**; accept equivalents like **sensing magnetic fields**]
[10] As shown by Hsu and Li, trophocytes in the abdomen of this species contain iron oxide granules used for magnetic sensing. Worker policing in this species occurs by worker-laid eggs getting eaten.
ANSWER: western or European **honeybee** [or *Apis mellifera*; prompt on bee]
[10] Honeybee colonies are frequently infected by mites from this genus, in particular the species *destructor* and *jacobsoni*. This genus of mites also carries the Deformed Wing Virus.
ANSWER: *Varroa*