**Tossups**

1. Users of this weapon practiced in areas called “butts,” where they were required to train every Sunday. According to legend, users of this weapon held up two fingers to mock their enemies, who threatened to cut off the index and middle fingers of captured wielders of this weapon. Many skeletons of people who used this weapon are noticeably deformed, with large burls on their left arms and shoulders. This weapon, which could send up to six projectiles a minute 300 yards downrange, inflicted massive casualties on French knights at the battles of Crécy and Agincourt. For 10 points, name this weapon used by English archers to great effect in the Hundred Years’ War.

ANSWER: English **longbow** [prompt on bow and arrow]

1. A philosopher argued that this concept must apply in the acquisition or transfer of private property for this concept to be present in society, according to the entitlement theory. That thinker opposed patterned theories of this concept by describing a system where people voluntarily pay to watch Wilt Chamberlain. Another thinker proposed to apply this concept by following the difference principle. That philosopher argued that this concept would be realized by people organizing society from the original position because of the veil of ignorance. For 10 points, name this subject of a *Theory* by John Rawls, a concept describing what is believed to be fair in society.

ANSWER: distributive **justice** [prompt on “equality” or “fairness” or similar answers; accept *A Theory of* ***Justice***]

1. This is the third and final letter that appears in the nickname of a landmark paper on Big Bang nucleosynthesis published by Ralph Alpher, George Gamow and Hans Bethe. This letter also represents the ratio of the magnetic momentum of a particle to its angular momentum, known as the gyromagnetic ratio. The adiabatic index, which is equal to the ratio of the constant pressure and constant volume heat capacities, is given this letter. This letter also represents a quantity widely used in time dilation and length contraction calculations, known as the Lorentz factor. Radiation of this type consists of a high energy photons. For 10 points, name this third Greek letter after alpha and beta.

ANSWER: **gamma**

1. The saliva of this creature forms the river Ván. He easily breaks Leyding and Dromí after being challenged by the gods to test his strength. This creature will be killed when Vidarr rips open his mouth by stepping on his lower jaw with a boot consisting of discarded toepieces. His children Sköll and Hati Hródvitnisson chase the sun and the moon around the sky. This creature bites off Týr’s hand after he is bound with an object made of ingredients such as the roots of a mountain and the beard of a woman, a deceptively thin chain called Gleipnir. For 10 points, name this wolf from Norse mythology that will eat Odin at Ragnarök, one of the children of Loki.

ANSWER: **Fenrir** [or **Fenrisúlf**r; or **Hródvitnir**; or **Vanagand**r]

1. Trombones feature heavily in a funeral march written by this composer known as the “Dead March.” This composer reworked his funeral march “The Ways of Zion Do Mourn” to create a piece lamenting Joseph’s death. A piece by this man has an overture notated as a “Sinfony” and includes a pastoral “Pifa” movement. This composer collaborated with librettist Charles Jennens on the pieces *Saul* and *Israel in Egypt*. Since the time of George II, every British coronation has used his anthem *Zadok the Priest*. His most famous oratorio includes the line “And He shall reign for ever and ever” in the “Hallelujah” chorus. For 10 points, identify this composer of *Messiah*.

ANSWER: George Frideric **Handel** [or Georg Friedrich **Händel**]

1. One verse by this poet addresses an object made of rags with a “visage [that] was so irksome in my sight.” At the end of a poem, this writer despaired: “The world no longer let me love, my hope and treasure lies above.” This poet wrote of a love valued above “whole mines of gold” or “all the riches that the East doth hold” in a poem that opens: “If ever two were one, then surely we.” In another poem, this writer lamented “my pleasant things in ashes lie” following a conflagration. For 10 points, name this colonial poet of “To My Dear and Loving Husband” and “Verses Upon the Burning of Our House,” which appear in her collection *The Tenth Muse Lately Sprung Up in America.*

ANSWER: Anne **Bradstreet**

1. The olinguito was discovered by a scientist associated with this institution, and the “Q?rius” (“curious”) complex in this institution is housed in a building that is notably open 364 days of the year. A building that is part of this institution was designed as an inverted step pyramid lined with a bronze scrim. The administration of this institution is housed in a building dubbed “The Castle,” which is located across from a museum whose rotunda houses an iconic elephant statue. An institute for African American History and Culture recently opened as part of this institution. For 10 points, name this institution that runs a Natural History Museum and the National Zoo in Washington, DC.  
   ANSWER: **Smithsonian** Institution
2. Nearly two dozen citizens of this country were killed in a series of riots in January 1964 that were triggered by the desecration of this country’s flag after protesters attempted to raise it above Balboa High School. Jesse Helms vigorously opposed a treaty named for this country’s dictator Omar Torrijos and Jimmy Carter that returned a strategic asset to it. The United States was granted a ten-mile-wide strip of land running across this country after it signed the Hay–Bunau–Varilla Treaty three days after it gained independence from Colombia. For 10 points, name this isthmus country in Central America, which was the site of great strategic interest to the United States due to its namesake canal.

ANSWER: Republic of **Panama** [or *República de Panamá*; accept **Panama** Canal; accept **Panama** Canal Zone]

1. This quantity is equal to the “number of lattice points, plus half the number of boundary points, minus one,” according to Pick’s theorem. Given a set of points *n*, this quantity can be calculated by constructing an “*n* plusone by two” matrix with the shoelace theorem. Gabriel’s horn has an infinite amount for this quantity. For a cyclic quadrilateral, this quantity can be calculated with Brahmagupta’s theorem. The semiperimeter is used to calculate it for a triangle according to Heron’s formula. An integral is equivalent to finding this quantity under a curve. For 10 points, name this quantity, which for a triangle is one half base times height.

ANSWER: **area** [accept surface **area**]

1. In a scene from this ballet’s second act, four dancers perform sixteen *pas de chat* after entering the stage in a line with their arms crossed in front of each other, grasping each other’s hands. A prominent theme from this ballet beginning with an F-sharp half note, four ascending eighth notes, and another F-sharp is played by solo oboe over harp and tremolo strings. At a ball in its third act, the male lead is seduced by the antagonist’s disguised daughter, who is now often played by the same dancer as the female lead. The many different endings to this ballet often involve a clash between Prince Siegfried and the villainous sorcerer Von Rothbart. For 10 points, name this Tchaikovsky ballet in which Odette is cursed to live as the title bird.

ANSWER: ***Swan Lake*** [or ***Lebedinoye ozero***]

1. A character created by this author compares the Sunday routine of passers-by to performances in a play. Another character created by this author instructs four men to construct the marquee next to the lily-lawn. The title English teacher becomes depressed after a young couple insults her fur in this author’s story “Miss Brill.” In a story by this author, Harry Young’s affair with Pearl causes his wife Bertha to lose the title emotion. This author wrote another story in which news of Mr. Scott’s horse-related death ruins Laura Sheridan’s time at the title celebration. For 10 points, name this author of “Bliss” and “The Garden Party,” a modernist writer from New Zealand.

ANSWER: Katherine **Mansfield** Murry

1. RAFT, or reversible addition-fragmentation chain transfer polymerization, uses thiocarbonyl compounds as a source of these molecules. Rate laws for reactions with these species can have fractional reaction orders. The release of nitrogen gas from AIBN generates two identical molecules of this kind. Bromination with NBS proceeds through a mechanism of this type. These molecules are produced from heterolytic bond cleavages. Mechanisms involving these species have initiation, propagation, and termination steps and use fishhook arrows. For 10 points, name these molecules that contain unpaired electrons.

ANSWER: **radical**s

1. This country’s delegates walked out on the Hallstein Commission after deadlock regarding funding of the Common Agricultural Policy, precipitating the “empty chair crisis.” This country experienced a period of prosperity from 1945 to 1975 known as the “Thirty Glorious Years.” All foreign forces stationed in this country were ordered to leave it after this country withdrew from NATO in 1966. A leader of this country fled it in response to a series of nationwide protests taking place during the month of May 1968. In 1962, this country signed the Évian Accords granting independence to its colony Algeria. For 10 points, name this country whose Fifth Republic was first led by Charles de Gaulle.

ANSWER: **France** [accept **French** Fifth Republic; or *République* ***française***]

1. One of this poet’s speakers recalls his mother telling him that his “sun-burnt face is but a cloud, and like a shady grove.” In another poem by this writer, the speaker awakens to find his “foe outstretched beneath the [title object]”, and claims that his wrath “grew both day and night / till it bore an apple bright.”This author of “The Little Black Boy” and “The Poison Tree” asked one of his title subjects, “Dost thou know who made thee?” and wrote another poem about an animal with “dread hand” and “dread feet” “burning bright in the forests of the night.” For 10 points, name this poet, whose *Songs of Innocence and Experience* contain “The Lamb” and “The Tyger.”

ANSWER: William **Blake**

1. It’s not VDJ recombination, but one assay for this process uses the enzyme TdT to add dUTP to nicked DNA ends. When run on a gel, DNA isolated from cells following this process appears to be “laddering.” The movement of phosphatidylserine from the inner leaflet of the plasma membrane to the outer leaflet signals this process. The assembly of the DISC complex upon activation of the fas receptor begins this process. Bax, BAD, and other members of the Bcl-2 protein family regulate this process. In this process, the release of cytochrome C from the mitochondria leads to a cascade of caspase activation. For 10 points, name this process of programmed cell death.

ANSWER: **apoptosis** [prompt on “programmed cell death” until mentioned]

1. This writer described a battle that “closes deep and bloody” as the shouts of war are “heard afar” in a poem whose title inspired another author’s play about the soldier Harry Heegan. This poet wrote “The Silver Tassie” and a poem about an inebriated farmer’s escape from a group of witches to Alloway Kirk. The speaker of a poem by this author regrets that “man’s dominion has broken Nature’s social union” after accidentally ploughing through the lands of a “tim’rous beastie.” Another poem by this writer of “Tam O’Shanter” mentions “gowans fine” and “a right gude-willie waught.” For 10 points, name this Scottish author of the poems “To a Mouse” and “Auld Lang Syne.”

ANSWER: Robert **Burns**

1. On this holiday, no blessing is said during a ritual handwashing called *Rachtzah*, which occurs before observers dip a vegetable in salt water. The *zeroa* and *beitzah* are prepared for this holiday but not eaten as a reminder of the destruction of the Temple. Observers of this holiday pray, “Next year in Jerusalem!” at the end of their meal. The night before this holiday, families search by candlelight for *chametz*, which is then burned the next morning. The rituals performed at this holiday’s feast are dictated by the Haggadah, and only unleavened bread or *matzo* can be eaten. For 10 points, name this Jewish holiday that includes the *seder* feast and celebrates the Exodus from Egypt.

ANSWER: **Passover** [or **Pesach**]

1. Near the start of his presidency, this man described how “every gun that is made… signifies, in the final sense, a theft from those who hunger and are not fed” in his “The Chance for Peace” speech. Under this president’s namesake doctrine, any Middle Eastern country could request American military aid against foreign aggression. This president’s security policy was known as the New Look, which included the doctrine of massive retaliation. In his farewell address, this president warned against the development of the military–industrial complex. American involvement in the Korean War was ended by this president. For 10 points, name this president throughout much of the 1950s.

ANSWER: Dwight David **Eisenhower**

1. This painting was described as a “single mosaic of boredom” by the Marxist philosopher Ernest Bloch in his magnum opus *The Principle of Hope*. Years after first completing it, this painting’s artist added a border of blue, red, and orange to offset it from the clean white background. The background of this painting shows a man playing a horn and two soldiers in green uniform looking away from the viewer. A young girl dressed in white holds the hand of a woman wearing orange in the center of this painting, which is set on the opposite riverbank as its artist’s *Bathers at Asnieres*. For 10 points, name this pointillist masterpiece by Georges Seurat.

ANSWER: *A* ***Sunday Afternoon*** *on the Island of* ***La Grande Jatte****—1884* [accept either underlined part;or *Un* ***dimanche après-midi*** *à l'Île de la Grande Jatte--1884*; or *A* ***Sunday on La Grande Jatte***; accept “Isle” for “Island” in all cases]

1. A play by this author includes an epilogue apologizing to the audience for the play’s lack of a fitting ending. In that play, a cross-dressing former prostitute receives one thousand silver dollars from a trio of gods, and eventually opens a tobacco factory. A character created by this author receives her nickname for navigating a bombarded city in order to sell fifty moldy loaves of bread. That character’s children include the mute Kattrin, the brave Eilif, and the honest Swiss Cheese. For 10 points, name this German playwright of *The Good Person of Szechwan,* who wrote about the title canteen wagon owner during the Thirty Years’ War in *Mother Courage and Her Children.*

ANSWER: Bertolt **Brecht** [or Eugen Bertolt Friedrich **Brecht**]

1. It’s not in the brain, but this structure secretes a hormone which is combined with cocaine to produce a mixture used in ENT surgery known as Moffett’s solution. Excess secretion of a hormone produced in this structure leads to high blood pressure and is known as Conn’s syndrome. The renin–angiotensin pathway ultimately results in secretion of aldosterone from this structure. One disease of these structures, stemming from a deficiency in CRH or ACTH, leads to a deficiency in cortisol and is known as Addison’s disease. A hormone produced by this structure induces the fight-or-flight response. For 10 points, name these glands that produce adrenaline and are found on top of the kidneys.

ANSWER: **adrenal** glands

**Bonuses**

1. Lectures given by Ferdinand de Saussure were compiled into a book titled for this field, and Noam Chomsky created its theory of a universal grammar. For 10 points each:

[10] Name this field of social science that is the study of human language.

ANSWER: **linguistics**

[10] Chomsky wrote a book titled for this concept’s “structures” in 1957. In that book, the sentence “Colorless green ideas sleep furiously” follows this concept, which refers to rules that determine the order of words in a sentence.

ANSWER: **syntax** [accept **syntactics**; accept ***Syntactic*** *Structures*]

[10] This other subfield of linguistics was studied by British philosopher J.L. Austin in his book *How to Do Things with Words*. It includes the concept of speech acts, like asking a question or making a threat.

ANSWER: **pragmatics**

1. The landscape surrounding this residence is supposedly based on Poussin’s *The Funeral of Phocion*. For 10 points each:

[10] Identify this building. This residence in New Canaan, Connecticut contains a Painting Gallery built into the side of a hill and was heavily influenced by the Farnsworth House.

ANSWER: **Glass House** [accept **798–856 Ponus Ridge Road**]

[10] This architect designed the Glass House. This man was the original architect of the Rothko Chapel and he is the alphabetically prior of the two architects who collaborated on the Seagram Building.

ANSWER: Philip Cortelyou **Johnson**

[10] Johnson collaborated with this other architect on the Seagram Building. This architect was the last director of the Bauhaus and espoused the maxim of “less is more.”

ANSWER: Ludwig **Mies** van der Rohe [or Maria Ludwig Michael **Mies**]

1. Answer the following about life in the Wild West… through Westerns starring John Wayne. For 10 points each:

[10] John Wayne played Davy Crockett in a 1960 movie about the last stand of Texan forces at this mission located in San Antonio.

ANSWER: the **Alamo**[or *The* ***Alamo***; accept Battle of the **Alamo**]

[10] John Wayne won his only Oscar in *True Grit* as “Rooster” Cogburn, who tracks outlaw Tom Chaney into the Indian Territory, which later became this state in 1907.

ANSWER: **Oklahoma**

[10] *Hondo* is based on the short story “The Gift of” this Apache chief, who launched guerilla raids from the Dragoon Mountains until he signed a peace treaty with Oliver O. Howard in 1872.

ANSWER: **Cochise** [or **Cheis**; or **A-da-tli-chi**; or **K’uu-ch’ish**]

1. A referee is trying to get away from two athletes butting heads in this artist’s *Stag at Sharkey’s*. For 10 points each:

[10] Name this American realist who depicted a trolley car navigating through a bustling street above which clothes are hung out to dry in *Cliff Dwellers*.

ANSWER: George Wesley **Bellows**

[10] *Cliff Dwellers* depicts the Lower East Side neighborhood of this city. This city’s art museums include the MoMA and the Met, which abuts this city’s Central Park.

ANSWER: **New York** City

[10] This American realist painted a scene on the Schuylkill River in *Max Schmitt in a Single Scull*. Franklin West is shown taking notes as the title professor lectures at Jefferson Medical College in another of his paintings.

ANSWER: Thomas Cowperthwait **Eakins**

1. A 1973 book about one of these places relied on the eyewitness accounts of 227 residents. For 10 points each:

[10] Name this type of place. Shukhov, a member of Gang 104, appears in a novel which spans twenty-four hours of his life in one of these places.

ANSWER: **gulag** camps

[10] This Soviet author partly drew on his own experiences at a gulag camp to write *The Gulag Archipelago.* He also wrote *One Day in the Life of Ivan Denisovich.*

ANSWER: Aleksandr Isayevich **Solzhenitsyn**

[10] The young Leo Auberg is sent to a gulag camp in this Romanian author’s prose poem *The Hunger Angel.*

ANSWER: Herta **Müller**

1. These functions are symmetric for bosons and antisymmetric for fermions. For 10 points each:

[10] Name these functions, denoted by the letter psi, that give the quantum state of a particle. Their square gives the probability of finding a particle at a particular state, and observation leads to their collapse.

ANSWER: **wavefunction**s

[10] It is often mathematically convenient to represent the wavefunction as one of these quantities that possesses both a magnitude and a direction.  
ANSWER: **vectors**

[10] A set of wavefunctions for a system has this property if all of their possible inner products are either zero or one.

ANSWER: **orthonormal**ity

1. In the Qur’an, the terms *jurum*, *junah*, *haraj*, *khati’ah*, *dhanb*,and *ithm* refer to these actions. For 10 points each:

[10] Name these actions that the scholar al-Dhahabi classified as either *al-sagha’ir* or *al-kaba’ir*; the latter category of them includes *zina* and *shirk*.

ANSWER: **sin**s [accept word forms such as **sinning** or **sinner**s; prompt on “evil deeds” or “transgressions against Allah” or similar answers]

[10] *Shirk* is the sin of denying this core tenet of Islam concerning the nature of Allah. It is codified in the basic statement of Muslim belief, the *shahada*, which states this belief followed by “Muhammad is Allah’s prophet.”

ANSWER: **monotheism** [or ***tawhid***; accept Allah is the **one God** or **there is no god but Allah** or similar answers mentioning **one God** or **oneness**]

[10] Repentance of sin titles the ninth sura of the Qur’an, the at-Tawbah, which is the only one that does not begin with this opening phrase that translates as “in the name of God.”

ANSWER: **basmala** [or **bismillah**; or **bismillahi r-rahmani r-rahim**]

1. Animals native to this landmass include the Weddell seal, which stays under the fast ice and uses its teeth to make breathing holes. For 10 points each:

[10] Name this continent located around the South Pole, home to the emperor penguin. It is divided into Eastern and Western halves by a mountain range that runs between the Ross Sea and the Weddell Sea.

ANSWER: **Antarctica**

[10] This most active volcano in Antarctica is located on Ross Island. The ice caves formed around the fumaroles on this volcano are being studied for its microbial life because of their extremely nutrient-poor conditions.

ANSWER: Mount **Erebus**

[10] Vostok is the largest geographical feature of this type located under the Antarctic Ice Sheet. Various attempts to drill into that feature of this type have been opposed for the possibility of contamination by drilling fluid.

ANSWER: subglacial **lake**

1. Answer the following about times when people were chucked out of windows in Prague, for 10 points each.

[10] The Second Defenestration of Prague in 1618 triggered this horrendously long, bloody, and confusing war that involved nearly every country in Europe that was finally ended by the 1648 Treaty of Westphalia.

ANSWER: **Thirty Years**’ War

[10] The First Defenestration of Prague in 1419, which killed seven Prague town council members, was carried out by members of this religious movement, who followed the teachings of a heretic burned at the Council of Constance.

ANSWER: **Hus**sites [accept Jan **Hus**]

[10] The so-called “Third Defenestration of Prague” was when a Foreign Minister of Czechoslovakia with this surname was found beneath his bathroom window. This name was shared by his father, the first president of Czechoslovakia.

ANSWER: **Masaryk** [accept Jan **Masaryk**; accept Tomáš Garrigue **Masaryk**]

1. The silversword plant lineage diversified across this archipelago, and a monk seal named for this island chain is one of the only mammals endemic to it. For 10 points each:

[10] Name this Pacific island chain. The diverse honeycreeper species pool at these islands is a classic example of adaptive radiation.

ANSWER: **Hawaii**an islands

[10] The Hawaiian islands have a huge number of species of this type, such as the *coqui* frogs and the Japanese white-eye. This term is generally used to describe introduced species that drastically impact local ecosystems.

ANSWER: **invasive** species [prompt on non-native or exotic species]

[10] The Hawaiian islands are home to many species of this diptera genus. Some species in this genus are called the Hawaiian “picture wings”, and model organisms in this genus include the species *simulans* and *pseudo-obscura*.

ANSWER: ***Drosophila***

1. Daji was a spirit of this type sent by Nüwa to punish King Zhou of Shang. For 10 points each:

[10] Name this animal that often shapeshifts into beautiful women to seduce men in East Asian mythologies. They serve as the messengers of Inari, the *kami* of rice and most common dedicatee of Shinto shrines.

ANSWER: **fox**es

[10] This fox appears in French folklore as a trickster figure, usually pursued by or playing tricks on his uncle, the wolf Ysengrim.

ANSWER: **Reynard**

[10] Japanese *kitsune* can have up to nine of these body parts, growing more as they age. They sometimes forget to hide these body parts when shapeshifting into a human, and they can use them to generate supernatural fire.

ANSWER: **tail**s

1. In a novel titled for this sort of place, the retired art historian Max Morden stays at Miss Vavasour’s boardinghouse after the death of his wife, Anna. For 10 points each:

[10] Name this type of place, which also titles a novel about the reminiscing theatre director Charles Arrowby. Those novels were written by John Banville and Iris Murdoch, respectively.

ANSWER: the **sea** [accept “*The* ***Sea***” or “*The* ***Sea****, The Sea*”]

[10] Both of those novels won this prestigious literary prize awarded annually to the best English-language novel published in the United Kingdom. In 2016, Paul Beatty became the first American to win this prize.

ANSWER: Man **Booker** Prize for Fiction

[10] Beatty won the Booker for his novel *The Sellout*, a satire set near this West Coast city. In *The Day of the Locust,* Tod works on a painting of this city *Burning* after moving to this city’s neighborhood of Hollywood.

ANSWER: **Los Angeles** [accept **L.A.**]

1. In a novel, Max Spielman raises George Giles as though he is one of these animals. For 10 points each:

[10] Identify this type of animal. In a play, the architect Martin reveals to his wife Stevie that he is in love with one of these animals named Sylvia.

ANSWER: **goat**s [accept *Giles* ***Goat****-boy* or *The* ***Goat***, *or Who is Sylvia?*]

[10] This recently deceased playwright won the 2002 Tony Award for *The Goat, or Who is Sylvia?* Forty years earlier, this playwright won a Tony for *Who’s Afraid of Virginia Woolf?*

ANSWER: Edward Franklin **Albee** III

[10] In *Who’s Afraid of Virginia Woolf?*, the biology professor Nick and his wife Honey are hosted by these characters, an associate history professor and his wife. Name either character.

ANSWER: **George** or **Martha** [accept either]

1. A later philosopher criticized René Descartes’s use of this philosophical position as being solipsistic. For 10 points each:

[10] Name this position of philosophical doubt. It was held by a thinker that believed that philosophy must start by relying on “animal faith,” and thus, “Philosophy begins *in medias res*.”

ANSWER: **skepticism**

[10] This Spanish-American philosopher criticized Cartesian skepticism in *Skepticism and the Animal Faith*. This naturalist philosopher discussed moral philosophy in *The Life of Reason*.

ANSWER: George **Santayana** [or Jorge Agustín Nicolás Ruiz de **Santayana** y Borrás]

[10] In this work, Santayana divided existence into the four title categories of essence, matter, truth and spirit. According to this work, experience takes place through essence but is mediated by spirit.

ANSWER: *The* ***Realms of Being***

1. For 10 points each, answer the following about the life of Lepidus, that guy in the Second Triumvirate no one seems to talk about.

[10] Lepidus served in this position for more than thirty years, from 44 BC to his death in 13 BC. This position, which literally translates to “greatest bridge-builder,” was the chief priest of the Roman state religion.

ANSWER: ***pontifex maximus***

[10] For the year of 46 BC, Lepidus served with Julius Caesar in this position, which had become a sham anyways Two men each year were elected to this most prestigious political position in the Roman Republic.

ANSWER: **consul**

[10] Lepidus made a major blunder by not participating in this battle, instead allowing Mark Antony and Octavian to claim all the glory for finally defeating Caesar’s assassins Brutus and Cassius here.

ANSWER: Battle of **Philippi**

1. Indices that can be used to quantify this condition include the Palmer Severity Index, the Crop Moisture Index, and the Normalized Difference Vegetation Index, or NDVI. For 10 points each:

[10] Identify this term that refers to an extended period of time during which a given region experiences a shortage in precipitation.

ANSWER: meteorological **drought**

[10] Computations of the NDVI often rely on data from NOAA’s Advanced Very High Resolution Radiometer, or AVHRR. The AVHRR is used in what field of science that gathers information from afar, usually from space?

ANSWER: **remote sensing**

[10] Remote sensing is an important source of data for this type of software, whose most popular example is developed by Esri.

ANSWER: **geographic information system** software [or **GIS** software]

1. For 10 points each, answer the following about the bread-and-butter of Western art music since the 1700s: sonata form composition.

[10] Sonata form was developed during this musical era, which comprises the late 1700s and early 1800s. Mozart and Haydn’s compositions are considered the epitome of this era, which was followed by the Romantic.

ANSWER: **Classical** period

[10] Sonata form traditionally comprises the exposition, in which themes are presented, the development, in which those themes are modified, and this section, in which the themes are stated again.

ANSWER: **recapitulation**

[10] Sonata form may include one of these passages at the very end. They may be notated with a symbol similar to a crosshair, and take their name from the Italian for “tail.”

ANSWER: **coda** [or **codetta**]

1. These people were rooted out by having them trample flat icons called *fumi-e*. For 10 points each:

[10] Name these people who were forced into hiding following the failed Shimabara Rebellion.  
ANSWER: Japanese **Christian**s [accept **Catholic**s; accept *Kakure* ***Kirishitan***; do not accept or prompt on Protestants or Lutherans or any other branch of Christianity; prompt on just Japanese people]

[10] The Shimabara Rebellion occurred during this period of Japanese history, which lasted from 1603 to 1868, when it was ended by the Meiji Restoration.

ANSWER: **Tokugawa** shogunate [or **Edo** Period; or **Tokugawa** bakufu; or **Edo** bakufu]

[10] During the Tokugawa shogunate, Christianity was banned as part of this policy, in which Japan closed itself off to almost all foreign contact. Matthew Perry forcibly ended this policy with his “Black Ships.”

ANSWER: **isolation**ism [or ***sakoku***; prompt on descriptions of foreigners unable to enter Japan]

1. This character’s future wife is the sister of Ismene. For 10 points each:

[10] Identify this character who discovers that his betrothed hanged herself in a cave. In response, this character attempts to kill his father Creon, misses, and instead kills himself.

ANSWER: **Haemon**

[10] Haemon appears in *Antigone*, a play from this Ancient Greek playwright’s Theban trilogy. That trilogy also includes this writer’s *Oedipus Rex.*

ANSWER: **Sophocles**

[10] Sophocles’ *Antigone* includes lines for this group of performers. Sophocles dictated that this group would number fifteen in his plays, whereas Aeschylus set this group’s size at twelve.

ANSWER: the Greek **chorus**

1. The speaker notes that “Though lovers be lost, death shall not” in this poet’s “And death shall have no dominion.” For 10 points each:  
   [10] Name this Welsh poet, who urged his sickly father to “rage, rage against the dying of the light” in his 1951 poem “Do not go gentle into that good night.”  
   ANSWER: Dylan Marlais **Thomas**  
   [10] Thomas’s “Do not go gentle into that good night” takes on this poetic structure, consisting of nineteen lines divided into five tercets followed by a quatrain. Elizabeth Bishop wrote a poem of this type titled “One Art.”  
   ANSWER: **villanelle**s  
   [10] This Theodore Roethke villanelle asserts, “We think by feeling. What is there to know?” Its opening stanza concludes: “I learn by going where I have to go.”  
   ANSWER: “The **Waking**”
2. These molecules are trigonal planar and have a positive charge due to an unoccupied p orbital. For 10 points each:

[10] Name these reactive intermediates produced during SN1 and E1 reactions. They can be formed when a good leaving group, like a halide, leaves a molecule like *tert*-butyl iodide.

ANSWER: **carbocation**s

[10] E1 is a unimolecular example of this type of reaction. In their bimolecular version, a strong base removes a proton, forming a double bond, which kicks off a halide all in one step.

ANSWER: **elimination**

[10] E1 reactions typically occur only when a tertiary alcohol is treated with this strong acid. This acid is produced with a vanadium catalyst in the contact process.  
ANSWER: **sulfuric** acid [accept **H2SO4**]

The Gell-Mann-Nishijima formula calculates the charge of a particle from the isospin, baryon number, and this quantity. For 10 points each:

[10] Name this quantity possessed by particles like the kaon which contain a particular type of quark. Particles with the same value for this quantity appear on the same horizontal line of the Eightfold Way diagram.

ANSWER: **strange**ness

[10] Two