**Tossups**

1. Raney nickel contains an alloy of nickel and this element. An atom of this element bonded to four hydrogen atoms and accompanied by a lithium counterion forms a very strong reducing agent. This element’s trichloride is used as a Lewis acid in the first step of the Friedel-Crafts reaction. This element typically forms 3+ ions by losing 1 electron from its 3-p orbital and 2 electrons from its 3-s orbital. It is found along with sodium and fluorine in cryolite. This element is purified in the Bayer process by smelting the ore bauxite. For 10 points, name this metal from which most kitchen foil is made.

ANSWER: **Aluminum** [accept **Al**]

1. This poem describes how “a woman drew her long black hair out tight and fiddled whisper music on those strings.” The title of Doris Lessing’s *The Grass Is Singing* comes from an image in this poem. A character in this poem complains “My nerves are bad to-night.” Three lines of this poem consist only of the syllable “da,” which is then expanded into the words *datta*, *dayadhvam*, and *damyata*. This poem’s shortest section asks the reader to “consider Phlebas,” and is called “Death by Water.” Characters in this poem include Tiresias and a “famous clairvoyante” named Madame Sosostris. This poem, which ends with the words *shantih shantih shantih*, begins “April is the cruellest month.” For 10 points, name this poem by T. S. Eliot.

ANSWER: “The **Waste Land**”

1. Cells in this organ have spectrin-rich domains at the apex of folds in the plasma membrane in a structure called the transitional junction. Irregular function of this organ can be treated with Atenolol, which is a beta-blocker. Coupling between this organ’s cells occurs through their intercalated discs. The Frank-Starling law can be used to describe the mechanical behavior of this organ. Depolarization in this organ is indicated by the QRS complex on readouts from EKGs. This organ’s activity can be divided into the diastole and systole, during which it contracts. The aorta ascends from, for 10 points, which organ’s left ventricle?

ANSWER: **heart**

1. During a campaign in this state, rails were heated until they were red-hot, then twisted around trees to make them utterly irreparable. The infamous Andersonville prisoner-of-war camp was located in this state. Special Field Orders Number 120 allowed for soldiers to live off the land and destroy property in this state, part of a scorched-earth strategy intended to “make [this state] howl.” A coastal city in this state was given as “a Christmas gift” in 1864 to President Abraham Lincoln after its capture by William Tecumseh Sherman at the end of his March to the Sea. For 10 points, name this state which suffered major destruction during the Civil War, including the burning of its capital Atlanta.

ANSWER: **Georgia**

1. BMW commissioned this artist to paint its BMW M1 as part of its “Art Cars” series. This artist’s *Oxidation* painting partially created by urinating on the canvas. This artist’s large mural for the for the World’s Fair in Flushing Meadows depicted the mugshots of 13 criminals. *Silver Car Crash* is part of this artist’s *Death and Disaster* series. This artist frequently used the technique of silk-screen printing in his studio, “The Factory.” For ten points, identify this American Pop Artist who created many depictions of Elvis and Marylin Monroe and painted many Campbell’s Soup Cans.

ANSWER: Andy **Warhol**

1. In a story by this author, a merchant spends twenty-six years in prison after a murderer frames him for his crime by slipping his bloodied knife into the merchant’s bag. The title character of another story by this author earned his nickname when he stumbled and broke a jar of milk. This author of “God Sees the Truth, But Waits” and “Alyosha the Pot” wrote about a visitor to the Bashkirs who dies of exertion after attempting to walk the perimeter of his desired estate. The title character of a novella by this author critically injures himself while hanging up curtains. For 10 points, name this Russian author of “How Much Land Does a Man Need?” and *The Death of Ivan Ilyich.*

ANSWER: Leo **Tolstoy** [or Lev Nikolayevich **Tolstoy**]

1. This country is the origin of a type of belt or sash made of silk woven with gold wire, originating in the city of Slutsk. The west of this country contains Belovezhskaya Pushcha National Park, shared with its western neighbor and home to a large population of bison. A large war memorial complex in this country is located at the designated Hero Fortress in Brest. Most of the fallout from the Chernobyl disaster in its southern neighbor affected the south of this country, near its border with Ukraine. This country is sometimes called Europe’s last dictatorship under the rule of Alexander Lukashenko. For 10 points, name this Eastern European country with capital at Minsk.

ANSWER: Republic of **Belarus** [or *Respublika* ***Byelarus’***]

1. The making of this object results in a god’s mouth being sewn shut after its makers fail to collect on their prize of that god’s head. A god gets a fragment stuck in his forehead after using this object to kill a being who flung a whetstone in his defense. The possessor of this object hides it on his lap while crossdressing with the aid of a magic necklace. The dwarves Sindri and Brokk were stung by Loki in the form of a gadfly when making this object, resulting in its short handle. A “power-belt” and “iron-gripping” gloves were needed to wield this weapon that was used to kill Hrungnir and many other frost giants. For 10 points, name this hammer, the primary weapon of Thor.

ANSWER: **Mjollnir**

1. Italian nationalist poet Gabriele D’Annunzio led a small squadron of planes which dropped thousands of pro-Italian propaganda leaflets on this city. The extremely anti-Semitic Karl Lueger modernized this city as its mayor for 13 years. Students in this city formed the Academic Legion, which forced a Foreign Minister to flee this city on March 13, 1848. Cisleithania was directly ruled from this city after the Ausgleich, and was where Franz Joseph and his court resided. A meeting in this city in the aftermath of the Napoleonic Wars attempted to maintain a balance of power in the “Concert of Europe” and was organized by Klemens von Metternich. For 10 points, name this capital of the Austrian Empire.

ANSWER: **Vienna** [or **Wien**]

1. An artist from this country complained about his lack of recognition by writing a paragraph including the line "Oh the vagaries of human life!" on the back of his *Self-Portrait as a Drowned Man*. Another artist from this country used a series of hot-air balloons to become the first aerial photographer. A scene set behind a train station in which a man leaps from a ladder over a puddle was photographed by an artist from this country who sought to capture the "decisive moment". A man from this country used mercury-treated silver-plated copper sheets in a namesake early photography technique. For 10 points, name this country, the birthplace of such photographers as Nadar, Henri Cartier-Bresson, and Louis Daguerre.

ANSWER: **France** [accept the **French** Republic or Republique **Francaise**]

1. Symplectic manifolds have dimensions with this property. Integers described by this term are *not* taken to the namesake value in the “3n+1” Collatz conjecture. The sum of degrees of a graph’s vertices has this property, by the handshake lemma. The alternating group consists of all permutations described by this term, which have positive sign. All of these numbers can be written as a sum of two primes, according to Goldbach’s conjecture. It is an open question whether or not all perfect numbers have this property. Functions described by this term include cosine and x-squared, and are symmetric about the y-axis. For 10 points, what term describes numbers divisible by 2?

ANSWER: **even** numbers/functions/permutations

1. This team’s WNBA team won the 2004 and 2011 titles led by point guard Sue Bird. In the 93-94 season an NBA team from this city compiled a league-best 63-19 record but lost in the first round to the eighth seed Nuggets. The only point guard to win Defensive Player of the Year played on this team for the majority of his career and was nicknamed “The Glove.” Shawn Kemp and that player, Gary Payton, both spent most of their careers during the 90s. In 2006, Starbucks CEO Howard Schultz sold its basketball team which, in 2008, was relocated to Oklahoma City. For 10 points, name this city which was formerly home to the Supersonics and is the current home of the Mariners and Seahawks.

ANSWER: **Seattle**, Washington

1. In this country’s fictional town of Desperance, Angel Day leaves her husband Norm for Big Mozzie Fishman. Commander Towers scuttles the *Scorpion* off of this country’s coast at the end of a novel that fictionalizes the nuclear fallout following World War III. Authors from this country include Alexis Wright and Nevil Shute, as well as a writer who described Hurtle Duffield’s life as a painter in *The Vivisector.* In another novel, an Anglican priest with a proclivity for gambling makes a bet with a young heiress about transporting a glass church across part of this country. For 10 points, name this country home to Patrick White and the author of *Oscar and Lucinda*, Peter Carey.

ANSWER: **Australia**

1. The McCone Commission investigated a series of unrest in this city that was sparked by the arrest of Marquette Fry for drunk driving. George Deukmejian defeated a mayor of this city twice in gubernatorial elections though that mayor led in opinion polls, leading to the so-called “Bradley effect.” Latasha Harlins was killed in this city after she was accused of stealing a bottle of orange juice by a convenience store owner. In this city, many Korean-owned shops were attacked in a series of 1992 riots sparked by a video capturing police officers beating up a black motorist. For 10 points, name this city which was the site of the Watts and the Rodney King riots, a major city in Southern California.

ANSWER: **Los Angeles**, California [or **LA**]

1. A leader of this organization called for educators to shape their students into “men and women for others.” Its founder had an epiphany after praying for eleven months in a cave in Manresa. Members and followers of this organization practice the Examen of Consciousness to find God’s presence in their lives, a process called its founder’s namesake “discernment.” Their motto is *Ad Majorem Dei Gloriam*, or “for the greater glory of God,” and their founder developed a series of prayers and meditations in his *Spiritual Exercises*. For 10 points, name this Catholic religious order founded by Ignatius of Loyola, of which Pope Francis is a member.

ANSWER: **Society of Jesus** [or ***Societas Jesu***; or **Jesuit**s]

1. A poem by this author compares its subject to “three-fork’d lightning” breaking through the clouds. That poem’s opening couplet declares “the forward youth that would appear must now forsake his Muses dear.” One of this poet’s speakers tells the addressee that it would take two hundred years to adore each of her breasts and thirty thousand years for the rest of her body, so that his “vegetable love should grow vaster than empire and more slow.” This author of “An Horatian Ode upon Cromwell’s Return from Ireland” created a speaker who worries about “time’s winged chariot hurrying near” and tells the addressee that her shyness wouldn’t be a problem “had we but world enough and time.” For 10 points, name this author of “To His Coy Mistress.”

ANSWER: Andrew **Marvell**

1. A philosopher reduced this concept into a simpler form with an example of two builders in a namesake “game” to show that patterns within this concept are governed by family resemblances. J.L. Austin formulated the idea of illocutionary acts in his argument that the use of this faculty does not necessarily carry truth value. Ludwig Wittgenstein refuted the existence of a “private” version of this concept in his beetle-in-the-box argument, and he believed that the problems of philosophy all arise from misunderstandings in the use of these systems. For 10 points, name this general form of communication which can include writing or speech through systems such as English.

ANSWER: **language** [accept **speech** or **writing** before mentioned]

1. This man names an effect in which the polarization of a light wave rotates in response to a magnetic field in the direction of propagation. An apparatus used to catch charged particles in a vacuum is known as his “cup”. An equation named for this scientist states that the EMF is equal to the negative rate of change of magnetic flux and is applied in his namesake law of induction. A constant named for this man, equal to the product of elementary charge and Avogadro's number, is equal to the amount of charge carried by a mole of electrons and is applied in electrolysis calculations. For 10 points, name this scientist who names the SI unit of capacitance.

ANSWER: Michael **Faraday**

1. A piece published after this composer’s death as his Symphony No. 2 is a “symphony-cantata” that sets Biblical passages to words in 11 movements. This composer of *Lobgesang*. A symphony by this composer opens in *pianissimo* with a six-note motif traditional in the Saxon Service, the “Dresden Amen” - that symphony by him quotes the hymn “A Mighty Fortress Is Our God,” a hymn by Martin Luther, in its final movement. This man composed the “Reformation” symphony, as well as a famous “Wedding March” and Puck’s valedictory to accompany a certain play. For 10 points, name this composer of incidental music to *A* *Midsummer Night’s Dream*.

ANSWER: Felix **Mendelssohn** [or Jakob Ludwig Felix **Mendelssohn**-Bartholdy]

1. This country’s prime minister was killed when his car flipped over a five-story building in an assassination called Operation Ogre. The lower house of this country’s legislature was held hostage in the 23-F coup, which quickly fell apart after this country’s king denounced it. The “Pact Of Forgetting” attempted to dissociate this country from one of its dictators, under whom the only legal party was the Falange. After the Ifni War, this country relinquished Morocco as a colony. During this country’s civil war, the Condor Legion terror-bombed its city of Guernica. For 10 points, name this country currently ruled by Felipe VI, whose 1930s civil war was won by Nationalists under Francisco Franco.

ANSWER: **Spain** [or **Espana**]

1. In this region’s traditional society, 98% of its population were serfs who were subject to abuses like eye-gouging and hamstring-severing. The “70,000 Character Petition” detailed supposed abuses of power in this region, which joined another country by the terms of the Seventeen-Point agreement. In 1904, Lord Curzon sent an expedition led by Francis Younghusband to invade this region. The CIA funnelled money to rebels fighting for this region’s independence, which erupted into a 1959 uprising. This region was re-annexed into the People’s Republic of China after a 1950 invasion. For 10 points, name this region on a high plateau in southwestern China, whose spiritual leader is the Dalai Lama.

ANSWER: **Tibet** [or **Xizang**]

**Bonuses**

1. This task is now regularly performed using “high throughput” platforms developed by Illumina, which are used by companies like 23andMe to perform this task for full human genomes. For 10 points each:

[10] Name this task that is used to determine the order of nucleotides in a nucleic acid molecule.

ANSWER: DNA **sequencing** [accept word forms; accept RNA **sequencing**]

[10] Freshly generated DNA and Protein sequences are generally run through this bioinformatic algorithm that heuristically compares input sequences against a database of known sequences.

ANSWER: **BLAST** [or **Basic Local Alignment Search Tool**]

[10] A “Y” is recorded during DNA sequencing if there is ambiguity between tyrosine and cytosine, which are both this type of nitrogenous base. Unlike purines, which have 9-membered rings, these molecules have 6-membered heterocyclic rings.

ANSWER: **pyrimidines**

1. The first part of this two-part statement declares the concept of tawhid, or the oneness of God. For 10 points each:

[10] Name this declaration of faith and first Pillar of Islam. After performing this “testimony,” a convert would be expected to adhere to the rest of the Pillars of Islam.

ANSWER: **shahada** [or ***shahadatan***]

[10] The importance of the Five Pillars, along with other major tenets of Islam, are summarized in a hadith named for this figure. That hadith describes this figure appearing to Muhammad and his companions in human form.

ANSWER: **Gabriel** [or ***Jibril***]

[10] A version of the shahada is recited during the Tashahhud, a portion of this action performed while kneeling in the direction of Mecca. This action is performed five times a day as part of the Five Pillars.

ANSWER: **salat** [or **salah**; accept **prayer** or word forms]

1. Name these composers whose piano trios draw from Eastern European melodies, for 10 points each.

[10] This composer’s Piano Trio No. 2 in E minor uses Jewish melodies, perhaps as a tribute to victims of World War II. One of his symphonies depicts marching Nazis in its first-movement “invasion” theme.

ANSWER: Dmitri **Shostakovich** [or Dmitri Dmitriyevich **Shostakovich**]

[10] A traditional Slavic dance titles this composer’s Piano Trio No. 4 in E minor, whose last three movements are in harmonically disparate keys. He also drew on Slavic tales in his tone poem *The Water Goblin*.

ANSWER: Antonín **Dvořák** [or Antonín Leopold **Dvořák**]

[10] This composer arranged some of his *Hungarian Rhapsodies* for piano trio. This incredible piano virtuoso composed the *Transcendental Études*.

ANSWER: Franz **Liszt** [or **Liszt** Ferenc]

1. This novel’s frame narrative presents it as a puppet play. For 10 points each:

[10] Name this “novel without a hero” by William Makepeace Thackeray about Becky Sharp and Amelia Sedley. It gets its title from a location in *The Pilgrim’s Progress*.

ANSWER: ***Vanity Fair***

[10] Amelia is given one of these things as a present. She thinks it’s a present from George Osborne and loves it, but despises it when she finds out it was actually Dobbin who gave it to her.

ANSWER: a **piano**

[10] *Vanity Fair* includes a celebrated description of this historical event, during which George Osborne is killed.

ANSWER: Battle of **Waterloo** [accept Battle of **Quatre Bras**; prompt on the **Napoleonic** Wars]

1. John Hawkwood, who led the White Company, was one of the most famous of these people. For 10 points each:

[10] Name these mercenaries active in Renaissance Italy. Federico da Montefeltro was a Duke of Urbino who was an extremely successful one of these people.

ANSWER: ***condottieri*** [or ***condottiero***; or ***condottiere***; prompt on mercenaries]

[10] This Florentine political theorist attacked the use of *condottieri* as the cause for Italy’s instability in his treatise *The Prince*, in which he famously stated that “ends justify the means” and “tis better to be feared than loved.”

ANSWER: Niccolò **Machiavelli**

[10] Machiavelli’s other work includes “Discourses” on the work of this historian, who chronicled the history of the Roman Republic in his *Ab Urbe Condita*.

ANSWER: **Livy** [or Titus **Livius**; accept *Discourses on* ***Livy***]

1. Instead of describing God as “powerful,” this thinker described God as “not lacking power,” because God’s power cannot be compared with anything else. For 10 points each:

[10] Name this medieval philosopher who wrote *The Guide for the Perplexed* and compiled the *Mishneh Torah*. He included thirteen principles of faith in his commentary on the Mishnah.

ANSWER: Moses **Maimonides** [or Moshe ben **Maimon**; or Mūsā ibn **Maymūn**; or **Rambam**]

[10] Maimonides was a philosopher of the Sephardic tradition of this religion in Spain. Baruch Spinoza was expelled from this religion’s community in Amsterdam for his beliefs.

ANSWER: **Judaism** [or **Jew**ish]

[10] Maimonides disagreed with Aristotle regarding this event, which Aristotle believed did not happen because the world is eternal. However, Maimonides also rejected the *kalam* arguments proving that this event happened.

ANSWER: **creation** of the universe [or obvious equivalents]

1. The existence of this particle was predicted by the Dirac equation before its actual discovery. For 10 points each:

[10] Name these antiparticle of the electron. it emitted along with an electron neutrino in beta plus decay.  
ANSWER: **positron**

[10] In this process a positron and an electron are produced simultaneously from a photon. Certain types of supernovae are triggered when this process within a star reduces thermal pressure leading to instability.

ANSWER: **pair production**

[10] The cross section of pair production can be calculated from this scientist’s namesake diagrams which depict particle interactions with time on the horizontal axis. Bosons are depicted as wiggly lines on these diagrams.

ANSWER: **Feynman** diagrams

1. In one short story, Kandata attempts to use a thread of a spider to leave this place, but the Buddha watches as that attempt fails. For 10 points each:

[10] Name this place. In another short story, the artist Yoshihide starts abusing all of his apprentices and eventually hangs himself after he is asked to make a painting of this place.

ANSWER: **hell** [accept “**Hell Screen**”]

[10] “The Spider’s Thread” and “Hell Screen” were written by this Japanese master of the short story. The testimony of various characters about the dead body found in the woods comprises this author’s “In a Grove.”

ANSWER: Ryunosuke **Akutagawa** [or **Akutagawa** Ryunosuke]

[10] Akutagawa notably clashed with this Japanese author regarding the role of lyricism and structure in novel writing. This author wrote about the search for a husband for Yukiko in *The Makioka Sisters*.

ANSWER: Jun’ichiro **Tanizaki**

1. Michael Doyle is a Columbia professor who popularized the idea that war is absent among countries with this form of government, which is called its “peace theory.” For 10 points each:

[10] Name this form of government whose “direct” form was exemplified by ancient Athens.

ANSWER: **democracy** [accept word forms like **democratic**]

[10] Doyle popularized democratic peace theory with a paper analyzing Immanuel Kant, Machiavelli, and this Austrian economist, whose book *Capitalism, Socialism and Democracy* analyzed “creative destruction.”

ANSWER: Joseph Alois **Schumpeter**

[10] A central tenet of international relations, especially according to the realist school, is the assumption that states operate under this condition, in which there is no overarching sovereign power.

ANSWER: **anarchy** [accept word forms like **anarchic**]

1. One cause of this event decreased crop yields in Russia due to the Russian Revolution, which led to overcultivation of crops in the United States. For 10 points each:

[10] Name this environmental disaster in the Midwest that occurred about the same time as the Great Depression, which caused the mass migration of thousands of “Okies.”

ANSWER: **Dust Bowl**

[10] This president, who initiated the New Deal, attempted to stop the Dust Bowl with the Great Plains Shelterbelt, which planted over 200 million of trees in the Midwest.

ANSWER: **F**ranklin Delano **Roosevelt** [or **FDR**; prompt on Roosevelt]

[10] A New Deal-sponsored documentary about the Dust Bowl was titled [this thing] *That Broke the Plains*. One factually-incorrect saying about the Midwest stated that rain followed this object.

ANSWER: the **plow** [accept *The* ***Plow*** *That Broke the Plains*; accept rain follows the **plow**]

1. The Treaty of Hudaybiyah was signed between Mecca and this city. For 10 points each:

[10] Name this city, the second-holiest city in Islam.

ANSWER: **Medina**

[10] This Islamic prophet fled from Mecca to Medina in the *hijra*. He received the Quran and is considered by Muslims to be the “messenger of God.”

ANSWER: **Muhammad**

[10] This failed siege of Medina in 627 is often named for a defensive structure surrounding the city. Meccan forces, led by the Quraysh, as well as their Jewish allies, were thwarted by Muhammad’s military leadership in this battle.

ANSWER: Battle of the **Trench** [or Battle of the **Confederates**]

1. The lever rule can be used to calculate the weight percentages of components of these diagrams. For 10 points each:

[10] Name these diagrams which depict the temperature and pressure at which a substance changes between its solid, liquid and gas phases.

ANSWER: **phase** diagrams

[10] This equation can be used to calculate the slope of a tangent line to the coexistence curve of a phase diagram. It states that dP over dT is equal to the latent heat divided by the product of temperature and volume change.

ANSWER: **Clausius-Clapeyron** equation

[10] At these points on a binary phase diagram, the mixture of two substances melts at a temperature lower than either individual component.

ANSWER: **eutectic** point

1. Answer the following about American sculpture, for 10 points each.

[10] This sculpture, based on the Venus de Medici, was the masterpiece of Hiram Powers. The chains and the nudity of the female subject caused this work to be controversial at the time of its creation.

ANSWER: *The* ***Greek Slave***

[10] This artist’s sculpture *Bronco Buster* depicts a cowboy attempting to ride a bucking horse. This man also depicted two Native Americans facing a shadowy figure by a fire in his *Shotgun Hospitality*.

ANSWER: Frederic **Remington**

[10] Horatio Greenough’s *Enthroned* sculpture of this man features him barechested and brandishing a sword. This president was the subject of Gilbert Stuart’s *Lansdowne Portrait*

ANSWER: George **Washington**

1. *Note to moderator: Carefully read the answerline of the first bonus part.*

These events provide the only relief for the narrator’s insomnia, which is exacerbated by a lantern that blankets his room with images of characters from bedtime stories. For 10 points each:

[10] Name this specific type of action. The narrator is denied one of these when his family is visited by Charles Swann.

ANSWER: Marcel’s **bedtime kiss**es which he receives from his mother [accept clear equivalents involving a kiss and either bedtime or the narrator’s mother]

[10] Consuming a tea-soaked madeleine reminds the narrator of his childhood in the first section of this author’s seven-part magnum opus, *In Search of Lost Time*.

ANSWER: Marcel **Proust**

[10] The fifth part of *In Search of Lost Time* is titled for an inhabitant of this type of place. In another novel, Madame Defarge leads a mob in an attack on this type of place.

ANSWER: **prison**s [accept *The* ***Prison****er;* accept “the **Bastille**”]

1. This leader was defeated by Germanicus at the Battle of the Weser River. For 10 points each:

[10] Name this man who annihilated three Roman legions led by Quintilius Varus in a 9 AD battle set in a heavily wooded area.

ANSWER: **Arminius** [or **Hermann**]

[10] According to Suetonius, after hearing of the defeat at the Teutoburg Forest, this first emperor of Rome pounded the walls of his palace repeatedly yelling “Quintilius Varus, give me back my legions!”

ANSWER: **Augustus** [accept **Octavian** or **Octavius**, even though his name as emperor should be Augustus]

[10] After the disaster at the Teutoburg Forest, Rome began to withdraw from Germania to west of this river, which became the boundary between Gaul and Germania.

ANSWER: **Rhine** River

1. The northernmost of these form the Purple Forbidden Enclosure, surrounded by the Supreme Palace and the Heavenly Market, all visible year-round. For 10 points each:

[10] Name these entities that include the Twenty-Eight Mansions housing the moon, which are grouped into the Four Symbols including the White Tiger and the Vermillion Bird, based on what time of year they are visible.

ANSWER: Chinese **constellations** [or ***xingguan***]

[10] The constellations visible in the spring represent an Azure creature of this type sometimes identified with Ao Guang, who rules the Eastern Sea. This creature traditionally represents the Chinese emperor.

ANSWER: **dragon** [or ***long***; accept Azure **Dragon** or *Qing****long***]

[10] In Chinese mythology, this astronomical entity lying within a mansion of the Black Tortoise was created in order to separate a cowherd and a weaver girl. They are united once a year by a bridge of magpies across this entity.

ANSWER: **Milky Way** [or ***Yinhe***; prompt on Silver River]

1. A woman with an astonishingly green face peers at the viewer from this work’s right foreground. For 10 points each:

[10] Name this painting that depicts Édouard Dujardin and La Macarona seated around a table. The artist of this painting also created a poster for the cabaret where this painting is set.

ANSWER:***At the Moulin Rouge***[accept ***Au Moulin Rouge***]

[10] This diminutive French artist of *La Goulue* and *Waiting at Grenelle* painted *At the Moulin-Rouge*.

ANSWER: Henri **Toulouse-Lautrec**

[10] Toulouse-Lautrec’s *La Goulue* is usually identified with this artistic style. This turn of the century “total art style” was used by Hector Guimard for entrances to the Paris Metro.

ANSWER: **Art Nouveau**

1. This animal belongs to a character who lost one of his hands in an accident. For 10 points each:

[10] Identify this old and crippled animal which Carlson shoots in the back of the head out of mercy, foreshadowing the end of the novella.

ANSWER: **Candy**’s **dog**

[10] The fate of Candy’s dog is similar to that of Lennie Small, who is shot by George Milton at the end of this author’s *Of Mice and Men*.

ANSWER: John (Ernst) **Steinbeck**, Jr.

[10] Lennie dreams of raising these animals, partly because he loves being able to touch soft things.

ANSWER: **rabbit**s [or **bunnies**]

1. You’re a triangle. Answer the following about some properties you possess, for 10 points each:

[10] In a Euclidean space, your three angles always add up to this many degrees. Interestingly, if you’re inscribed in a circle, each of your angles subtends an arc corresponding to twice the angle, which is why a circle is 360 degrees.

ANSWER: **180** degrees

[10] Even if we disregard is the parallel postulate, then a triangle’s angles still sum to at most 180, according to a theorem named for Saccheri and this mathematician. His namesake “transform” interchanges Hamiltonian and Lagrangian mechanics.

ANSWER: Adrien-Marie **Legendre**

[10] This not entirely-obvious theorem states that, for an isosceles triangle, the angles opposite the equal sides are equal. Of course, it follows from the law of cosines, but using that would be cheating!

ANSWER: ***pons asinorum*** [or **bridge of donkeys**]

1. Give the following about the concept of beauty in poetry, for 10 points each:

[10] This poet claimed “all ye need to know” is that “beauty is truth, truth beauty” at the conclusion of his “Ode on a Grecian Urn.”  
ANSWER: John **Keats**

[10] This poet wrote about the fortunate few who “have heard [beauty’s] massive sandal set on stone” in her sonnet “Euclid alone has looked on beauty bare.” This poet’s “First Fig” opens: “My candle burns at both ends.”

ANSWER: Edna St. Vincent **Millay**

[10] This poet suggested that “beauty is its own excuse for Being” in “The Rhodora.” The speaker instructs a “meek lover of the good” to “Find me, and turn thy back on heaven” in this poet’s “Brahma.”

ANSWER: Ralph Waldo **Emerson**

1. The Goldman-Hodgkin-Katz equation can be used to calculate this quantity for an entire cell membrane or a channel permeable to multiple ions. For 10 points each:

[10] Name this quantity, the membrane potential at which the electrostatic forces on an ion are balanced by the diffusion gradient so there is no net movement of charge.   
ANSWER: **equilibrium potential** [accept **reversal potential**, or **Nernst potential**]

[10] This cation [“cat-ion”] has an equilibrium potential of positive 60 millivolts. Its voltage-gated channels open in the beginning of an action potential, and it is exchanged for potassium ions across the membrane by an ATPase pump.

ANSWER: **Na+**[accept **sodium**]

[10] The propagation speed of an action potential can be increased by wrapping a neuron in this fatty substance, which is produced by oligodendrocytes. This substance decreases the capacitance of the cell membrane.

ANSWER: **myelin**