**BATE Quizbowl Tournament**

**Round 6**

1 **One work of this type requires eight timpanists and ten cymbals, as well as four brass bands placed at the compass points of the stage. Another work of this type features trumpets surrounding the stage during its “Tuba mirum” section, and was composed to commemorate Alessandro Manzoni. Benjamin Britten’s version of this work includes settings of the poems of Wilfred Owen. Most of them, such as the ones composed by Guiseppe Verdi and Hector Berlioz, include movements called “Libera me,”  “Kyrie eleison,” and** “Dies irae.” For 10 points, name these choral works based on the Latin mass for the dead.   
ANSWER: **requiem**s [or **requiem** masses; or **mass**es for the **dead** before mentioned]

2 **Tensions during this event escalated with the killing of Major Rudolf Anderson and it ended with one side agreeing to remove their Il-28’s. General Curtis LeMay referred to this event as the greatest defeat in U.S. history. This event marked the first time the U.S. was put on DEFCON 2 and was sparked by photos taken by a** U-2 surveillance plane. This event led to the establishment of the red telephone “hotline” and saw the U.S. remove Jupiter missiles from both Italy and Turkey. For 10 points, name this 1962 showdown of the Cold War regarding the placement of weapons in a Caribbean nation.

ANSWER: **Cuban Missile Crisis** (accept equivalents that mention both Cuban and missiles)

3 **One special case of this process was ultimately responsible for the development of Martha’s Vineyard Sign Language during the 17th century. The Wright-Fisher model mathematically describes this effect. This effect is magnified during a rapid decrease in population called a population bottleneck, and a special case of it that occurs when a small group populates a new area is known as the** \*founder effect. It is most common for neutral genes; that is, they neither help nor hurt an organism. Unlike natural selection, this process is random. For 10 points, name this effect which sees the change in a gene’s frequency in a population.

ANSWER: genetic **drift** (accept “founder effect” before mentioned)

4 **One section of this novel features an emotional encounter after the protagonist reads *Ossian* to his love interest. A Thomas Mann novel based on this work is subtitled “The Beloved Returns” and writes of one of the character in Weimar; it is in Weimar that the protagonist meets Count C and Fraulein von B before he returns back to Wahlheim. Much of the novel focuses on the frustration of the protagonist over** Albert’s love for Charlotte; the protagonist later asks for a pair of pistols belonging to Albert. For 10 points, name this epistolary novel about a suicidal young artist, a work of the Storm and Stress movement written by Johann Goethe.

ANSWER: *The* ***Sorrows of Young Werther*** (accept *Die* ***Lieden des jungen Werther***)

5 **Whilst searching for the Hesperides, this figure stole the single eye of the Graeae (GREE-ee). He slew Cetus in order to rescue the daughter of Queen Cassiopeia, whom he later married. His most famous deed came at the behest of king Polydectes and was accomplished with the help of winged sandals, a helm of invisibility, and a** polished shield. The husband of Andromeda is, for 10 points, what mythical founder of Mycenae who had to flee from Stheno and Euryale after slaying their sister, Medusa?

ANSWER: **Perseus**

6 **In this country, the term zud refers to an extremely harsh winter that is difficult for livestock. Its northern Tuul River is considered sacred while its central portion is dominated by the Khangai mountains. The southeastern portion of this country is bordered by a region known as the “Inner” portion of this country; the southwestern portion of this country is bordered by the Xinjiang province. The northern and western portion of this nation is spanned by the** Altai Mountains while its southern portion is dominated by the Gobi desert. For 10 points, name this sparsely populated Asian nation sandwiched between China and Russia.

ANSWER: **Mongolia**

7 **This opera opens with the titular character's servant singing the aria *Notte e giorno faticar* about how he must work night and day. At one point, the protagonist angers Masetto by seducing his lover Zerlina. Earlier he had tried to seduce Donna Anna though that plan went awry after he killed Anna's father, the** Commendatore. After another failed seduction of Elvira, the protagonist's servant Leporello consoles her with the Catalogue Aria. This opera ends at a lavish dinner party where the titular character is dragged to hell by a statue of the Commendatore. For 10 points, name this Mozart opera about a womanizing Don.

ANSWER: ***Don Giovanni***

8 **Much of the fighting at this battle took place on Senlac Hill. Prior to this battle, the ruler of one side sent a force of housecarls to defeat Tostig and Hardrada at the Battle of** Stamford Bridge. Most of the forces of one side consisted of a type of militia called the fyrd and the events of this battle can found on the Bayeux tapestry. According to legend, the leader of one side was killed after he was struck in the eye with an arrow; that man was the Anglo-Saxon king Harold Godwinson. For 10 points, name this 1066 battle, a victory for the Norman forces of William the Conqueror.

ANSWER: Battle of **Hastings**

9 **The unique properties possessed by Teflon are due to an extreme value in the difference of this quantity. One definition states it is proportional to the average between the electron affinity and the first ionization energy. One formula for finding the difference of this value between atoms A and B uses the square root of the dissociation energy between A and B minus the average dissociation energies between A and A and B and B. Atoms with small differences of this quantity form** covalent bonds. One formula for this quantity was developed by Linus Pauling. Fluorine has the highest value of, for 10 points, what ability of an atom to attract electrons towards itself in a chemical bond?

ANSWER: **electronegativity**

10 **Maclovia delivers an address from Pantiland praising the title character for his organization in this author’s novel *Captain Pantoja and the Special Service*. The Counselor loses to the Throat-Slitter in another work, while Zavalita and Don Bermúdez are contrasted in a work set in a brothel, *Conversation in the Cathedral*. This author of *The War of the*** *End of the World* is better known for a work narrated by Mario about Pedro Camacho’s radio works. For ten points, identify this Peruvian author of *Aunt Julia and the Scriptwriter*.

Answer: Mario **Vargas Llosa**

11 **While in college, this man was a third string quarterback behind both Jerry Colquitt and future baseball player Todd Helton; he later finished behind Charles Woodson in Heisman voting in his final year as a Tennessee Volunteer. After a particularly poor performance by this quarterback, his coach Jim Mora infamously told reporters “Playoffs! Don’t talk about playoffs!”. This man was the MVP of Super Bowl 41 when his team beat the** Chicago Bears and he passes to receivers like Pierre Garcon, Dallas Clark, and Reggie Wayne. For 10 points, name this longtime current quarterback for the Indianapolis Colts.

ANSWER: **P**eyton **Manning** (prompt on “Manning”)

12 **Artificially, this mineral is manufactured using seed crystals called lascas. This mineral typically lacks a true crystal shape since it forms within the spaces of other crystals; that feature is due to the fact that this mineral is the last to crystallize from cooling magma, putting it at the bottom of Bowen’s reaction series. Aluminum 3 plus ions are in the smoky form of this mineral, while traces of iron gives this mineral an orange hue, a variant called citrine**. Amethyst is a form of this mineral, whose piezoelectric properties allow it be used an electronic oscillator in modern clocks. For 10 points, name this second most abundant mineral in the Earth’s crust, composed of silicon dioxide.

ANSWER: **quartz**

13 **In one of his campaigns, this man defeated Stefan Lazarevic and Beyezid the Thunderbolt at the Battle of Ankara. This man caused the downfall of the Tughlaq dynasty and dealt a crushing blow to the Golden Horde at the Battle of the Kondurcha River and the Battle of the Terek River. After detaining an envoy sent by the Emperor Hongwu, he led a short lived expedition against the Ming Dynasty. He defeated Nasi-u Din Mehmud, leading to his sack of** Delhi, and placed the capital of his empire at Samarkand. For 10 points, identify this Asian conqueror that built huge pyramids of enemy skulls.

ANSWER: **Tamerlane** (accept **Timur** Lenk or **Tamburlaine** or **Timur the Lame**)

14 **Baddeley and Hitch proposed a 1974 model of this process to oppose a 1968 multi-store model developed by Atkinson and Shiffrin. George Sperling developed the idea of an iconic form of this process, which is part of the larger sensory form of this process, which involves audio and visual observations. While studying one form of this process, George Miller estimated its capacity to be seven** plus or minus two. In general, the main steps of this process are considered to be encoding, storage and retrieval. For 10 points, name this neurological process that comes in long term and short term varieties.

ANSWER: **memory**

15 **One work by this poet describes a boy walking along a beach who hears the song of a mockingbird. He also wrote a poem that describes a common farmer who is the father of five sons in which the narrator states “the armies of those I love engirth me”. In another work by this man, the bugles trill for an individual whose lips are** pale and still. This man also wrote a poem that states “every atom belonging to me as good belongs to you” after saying “I celebrate myself”. For 10 points, name this American poet who wrote works like “I Sing the Body Electric” and “Song of Myself” in his collection *Leaves of Grass.*

ANSWER: Walt **Whitman**

16 **This artist depicted four slices of the titular foodstuff with butter in the painting *The Basket of Bread* and worked with the director Luis Bunuel on a film that opens with a razor slicing an eye. The creator of works such as *Soft Construction with Boiled Beans* and *The*** *Hallucinogenic Toreador*, this painter created a depiction of the crucifixion with cubes in *Corpus Hypercubus*. Cubes are again featured in the “disintegration” of his most famous work, which features a desert landscape and a certain device swarmed with ants. For 10 points, name this surrealists artist who depicted melting clocks in *The Persistence of Memory*.

ANSWER: Salvador **Dali**

17 **The Virgin Lands program of agricultural reform occurred during the rule of this man. It was during his rule that Francis Powers was captured; earlier, an unsuccessful coup against this man led to the removal of Gregory Malenkow and Nikolai Buganin. Imry Nagy led a revolt during the rule of this man, who was in power during the highly publicized U-2 crisis. He engaged Richard Nixon in the** Kitchen Debate, sent in troops to crush an uprising in Hungary, and delivered the Secret Speech denouncing the policies of his predecessor. For 10 points, name this man who led the Soviet Union after Stalin.

ANSWER: Nikita **Khrushchev**

18 **This man and his wife were the first people to be buried in the Cave of Machpelah,; this man also nearly committed another act while on Mount Moriah. In one story, he showed his father Terah the foolishness of pagan worship by smashing idols in his father’s shop. He also made a covenant with God, at which point he and his wife’s name were slightly changed. He later attempted to save** Sodom and Gomorrah by searching for 10 honest men. This man’s wife laughed after God informed her that she was pregnant; he himself was circumcised at the age of 99. For 10 points, name this father of Ishmael and Isaac, the original forefather in the book of Genesis.

ANSWER: **Abraham** or **Abram**

19 **For certain special cases, this quantity is proportional to the cross product of a particles position r with the gradient operator. For an electron, this quantity is determined by its azimuthal quantum number. In quantum mechanics, values of this quantity are equal to whole number multiples of the reduced Planck’s constant. The time derivative of this quantity is** torque, and this quantity can be defined as the product of the moment of inertia with angular velocity or the cross product of position with mass times velocity. For 10 points, name this quantity associated with rotational motion whose conservation forms the basis of Kepler’s second law.

ANSWER: **angular momentum** (do not accept “momentum”)

20 **One death in this play is announced by Graziano, who joins Lodovico on a trip.  One character in this play feuds with Montano and often sleeps with the prostitute Bianca. Emilia steals a handkerchief which is planted under** Cassio’s bed but is later killed by the antagonist of this play. At the end of this play, the title character is deceived by Iago into killing his wife Desdemona. For 10 points, name this play about a “Moor of Venice”, written by Shakespeare.

ANSWER: ***Othello****: The Moor of Venice*

**Extra Tossups**

21 **This man authored the *Bombard the Headquarters* post and official policy about him was that he was 70% correct and 30% incorrect. The Red Guard was a student movement mobilized by this leader. He used big character posters for one movement while another movement melted down pots and pans in an attempted effort at rapid industrialization. After leading the** Long March, this man encouraged criticism against his government during the Hundred Flowers Campaign. He also started a failed economic policy called the Great Leap Forward. For 10 points, name this first communist leader of China.

ANSWER: **Mao** **Zedong** (accept either name)

22 **The title character of this work is mistaken for a man named Gospodin by a clerk who works for the *Northern Bee*. The title object is found in Taurida Park before it is reunited with its owner by a man who begins the story preferring not to have coffee. The protagonist, who seeks a vice-Governorship, accuses Podtochina of theft in a letter that she interprets to be a marriage proposal. This story ends with Yakovlevich giving Kovalyev a** shave, by which point the title object has returned. For ten points, identify this short story by Nikolai Gogol in which the title body part leaves Kovalyev’s face.

ANSWER: “The **Nose**”

23 **One form of these objects has a bright emission spectrum at 500.7 nanometers which is the result of electrons in oxygen and nitrogen inhabiting excited metastable stables to form so called “forbidden lines”. The remnant of that object will form a white dwarf. There are diffuse and planetary forms of these objects, including the Cat’s Eye and** Horsehead varieties. The picture “The Pillars of Creation” shows the Eagle one, while another one was formed following a supernova observed by Chinese astronomers in 1054 AD. For 10 points, name these interstellar clouds of dust and gas which include one named Crab.

ANSWER: **nebula**

1 This man is a southern farmer tricked by Union scouts into blowing up the title structure. For 10 points each:

[10] Name this protagonist of “An Occurrence at Owl Creek Bridge”

ANSWER: **Peyton** **Farquhar** (accept either)

[10] “An Occurrence at Owl Creek Bridge” was a work by this American author who defined a lawyer as one “skilled at circumvention of the law” in his satirical *The Devil’s Dictionary.*

ANSWER: Ambrose **Bierce**

[10] Bierce also wrote this short story concerning the meaning of intelligence. It ends with a man killed by the chess playing robot he designed.

ANSWER: “**Moxon’s Master**”

2 Emile Zola’s letter *J’Accuse*, or “I Accuse”, was a reaction to this incident. For 10 points each:

[10] Name this French scandal of the late 19th century involving the false conviction of a Jewish officer.

ANSWER: **Dreyfus** affair/scandal

[10] After his conviction, Dreyfus was sent to this French penal colony about 7 miles north of French Guiana.

ANSWER: **Devil’s Island** or **Ile du Diable**

[10] In reality, the true culprit behind Dreyfus’s suspected crimes was this German spy in the French army who was eventually acquitted.

ANSWER: Ferdinand Walsin **Esterhazy**

3 This law states that physical laws are the same no matter what inertial frame of reference is used. For 10 points each:

[10] Name this theory introduced by Albert Einstein in the 1905 paper “On the Electrodynamics of Moving Bodies”.

ANSWER: **special relativity** (prompt on “relativity”, do not accept “general relativity”)

[10] Special relativity equations typically use this factor named for a Dutch physicist, equal to the speed of light divided by the square of the speed of light squared minus the observed velocity squared.

ANSWER: **Lorentz** factor

[10] Special relativity typically uses this four dimensional representation of space-time.

ANSWER: **Minkowski** spacetime

4 This group is notable for its set of written phrases like “the barking dog” and “the tears of a peasant boy”. For 10 points each:

[10] Name this group of four violin concertos written as “the contest between harmony and invention”.

ANSWER: *The* ***Four Seasons***(accept *Le* ***quattro stagioni***)

[10] *The Four Seasons* was a work by this Baroque composer who composed the opera *Juditha triumphans*.

ANSWER: Antonio **Vivaldi**

[10] This composer included the characters of Simon and Hanne in his similarly titled oratorio *The Seasons,* a follow up to his *The Creation*. He also composed the *Clock* and *Military* symphonies.

ANSWER: Franz Joseph **Haydn**

5 In the summer of 2010, two Middle Eastern countries wrote up bans on these products since they were unable to monitor activity on them. For 10 points each:

[10] Identify these smart phones produced by Research in Motion.

ANSWER: **BlackBerries**

[10] Two countries attempted to strong-arm RIM into forking over the encryption codes used to secure data, and one had earlier tried to install spyware on the handsets. Name either.

ANSWER: **Saudi Arabia** or **United Arab Emirates** (accept **UAE** for United Arab Emirates)

[10] The issue stems from the fact that the data is encrypted and stored on servers in this country, and not on individual servers in each country.

ANSWER: **Canada**

6 Changes in the consumer price index are often used as an indicator for this economic effect. For 10 points each:

[10] Name this term which describes a general rise in prices in an economy, the “hyper” variety of which has long been problematic in Zimbabwe.

ANSWER: **inflation**

[10] Stagflation, a rise in both unemployment and inflation, contrasted with this economic curve which gave an inverse relationship between the two.

ANSWER: **Philips** curve

[10] Inflation is one of the many factors used in this theory of economics proposed by John Muthin in which the outcome of a situation is partially affected by how people expect it to happen.

ANSWER: **rational expectation**s

7 This experiment heated a flask filled with organic compounds and used sparks to simulate lighting. For 10 points each:

[10] Name this 1952 experiment that showed how life could have emerged in early Earth condition.

ANSWER: **Miller-Urey** or **Urey-Miller** experiment

[10] This only achiral amino acid was the most abundant product formed during the experiment.

ANSWER: **glycine** (prompt on “Gly” or “G”)

[10] The mechanism of the reaction can be described by the Strecker synthesis. That reaction uses one of these organic compounds that contain a terminal carbonyl group.

ANSWER: **aldehyde**

8 A period of Russian history between the Rurik and Romanov dynasties is known as the Time of Troubles. For 10 points each:

[10] The Time of Troubles has its roots in the death of this infamous Russia ruler who according to legend blinded the architect of St. Basil’s Cathedral.

ANSWER: **Ivan IV** or **Ivan the Terrible**

[10] This subject of works by Pushkin and Mussorgsky served as a regent to Ivan the Terrible’s mentally handicapped son Feodor I and then served as Russian tsar until 1605. His death plunged Russia further into chaos.

ANSWER: Boris **Godunov**

[10] During the Time of Troubles, a group of three individuals were given this collective name after they all claimed to be the youngest son of Ivan the Terrible.

ANSWER: **False Dmitri**s

9 For 10 points each, answer the following about the Norse creation myth.

[10] This giant, created when ice from Niflheim came into contact with the warmth from Muspell, suckled on Audhumla. After he was slain, various parts of his body were used to form heaven, earth, and other objects.

ANSWER: **Ymir**

[10] The maggots that fed off Ymir’s flesh were used to create this race, primarily found under hills and mountains.

ANSWER: **dwarves**

[10] The Norse dwarves also created Mjollnir, a hammer belonging to this Norse god.

ANSWER: **Thor**

10 This work takes place at a party thrown by the sisters Kate and Julia Morkan. For 10 points each:

[10] Name this short story that focuses on the relationship of Gretta and her husband Gabriel Conroy.

ANSWER: “The **Dead**”

[10] “The Dead” is found in Dubliners, a short story collection by this Irish author of *Ulysses* and *A Portrait of the Artist as a Young Man.*

ANSWER: James **Joyce**

[10] *A Portrait of the Artist as a Young Man* was parodied in the poem *Portrait of the Artist as a Young Dog,* a work by this Welsh writer who created Captain Cat and Organ Morgan in his play *Under Milk Wood*.

ANSWER: Dylan **Thomas**

11 Answer these questions about Greek sculpture, for 10 points each.

[10] A well known sculpture by Myron shows a man about to throw one of these flat objects, an event performed at the Ancient Greek Olympics.

ANSWER: **discus** or **discus thrower** or ***Discobolus***

[10] This work by the sculptor Praxiteles shows one Greek god taking care of another Greek god, the result of an affair between Zeus and Semele.

ANSWER: ***Hermes and the Infant Dionysus***

[10] Polykleitos’s sculptures of a discus-bearer and a spear-bearer exhibit this sculptural property in which most of the weight lies one foot, creating a slight curve in the torso.

ANSWER: **contrapposto**

12 This man was forced out of the Holy See Embassy after U.S. forces blasted the Howard Stern Show on the radio. For 10 points each:

[10] Name this Central American dictator captured in 1989 following Operation Just Cause.

ANSWER: Manuel **Noriega**

[10] Noriega was a dictator of this Central American nation that gained independence from Colombia in 1903.

ANSWER: **Panama**

[10] From 1968 to 1981, Panama was led by this dictator, best known for signing a 1977 treaty with Jimmy Carter that set a timetable for the U.S. to give up control of the Panama Canal.

ANSWER: Omar **Torrijos**

13 One coordinate in this system can be found by taking the square root of the sum of the squares of the x and y variables. For 10 points each:

[10] Name this coordinate system which gives a point’s distance from the origin and angle from the positive x axis.

ANSWER: **polar** coordinate system

[10] Graphing the polar equation r equals a plus b cosine theta gives this shape. The cardiod is a special case of this more general shape formed by a rolling one circle around another circle.

ANSWER: **limacon** of Pascal

[10] A conic section can be graphed in polar coordinates with the equation r equals the inverse of one plus the eccentricity time cosine theta all times *l*, where *l* equals this value that represents the distance from the focus to the curve.

ANSWER: **semi-latus rectum**

14 The “fork” named for this philosopher divides human ideas into Relations of Ideas and Matters of Fact. For 10 points each:

[10] Name this Scottish philosopher of *An Enquiry Concerning Human Understanding* and *Dialogues Concerning Natural Religion*.

ANSWER: David **Hume**

[10] Hume collaborated with this other Scottish philosopher and author *The Theory of Moral Sentiments*. This philosopher also wrote about the “invisible hand” in his *The Wealth of Nations.*

ANSWER: Adam **Smith**

[10] Hume’s *A Treatise of Human Nature* described the “is-ought” problem which inspired the naturalistic fallacy of this philosopher of *Principia Ethica*.

ANSWER: George Edward **Moore**

15 In one work by this author, Said Mahran is released from prison only to find out that his former wife is now married to his Ilish. For 10 points each:

[10] Name this author *The Thief and the Dogs* and *Midaq Alley*.

ANSWER: Naguib **Mahfouz**

[10] Abd al-Jawad is the central character in this set of Mahfouz works set in an Egyptian city that include *Palace of Desire* and *Sugar Street*.

ANSWER: **Cairo Trilogy**

[10] Mahfouz’s *The Day the Leader was Killed* occurs during the assassination of this Egyptian leader who signed the Camp David Accords with Israel.

ANSWER: Anwar El **Sadat**

16 Around the same time of the BP oil spill, an oil spill in eastern China leaked anywhere from 1,500 to 90,000 tons of oil, depending on who you ask. For 10 points each:

[10] The oil leaked into this sea found between the Chinese coast and the Korean peninsula.

ANSWER: **Yellow** Sea

[10] The size of the spill is about equivalent to the Exxon Valdez spill, which leaked oil into this sound of southern Alaska.

ANSWER: **Prince William** Sound

[10] The spill took place in the town of Dalian, situated on the Liaodong peninsula. That peninsula lies west of this river that forms part of the North Korea-China border.

ANSWER: **Yalu** River

17 Among the effects of this event was the establishment of May Day on May 1st of every year. For 10 points each:

[10] Name this 1886 demonstration outside a McCormick plant which turned violent after an unknown participant threw a bomb into the crowd.

ANSWER: **Haymarket** riot/affair/demonstration/protest/massacre

[10] During the Haymarket Riot, members of this detective agency were brought in to ensure peace, although some suspect them of having thrown the bomb.

ANSWER: **Pinkerton** National Detective Agency

[10] A Pinkerton agent under the alias James McKenna infiltrated this secret Irish labor organization active in northeastern Pennsylvanian coal mines.

ANSWER: **Molly Maguires**

18 When this character is first introduced, he is described as an offspring of Cain. For 10 points each:

[10] Name this monster that along with his mother is killed in *Beowulf*.

ANSWER: **Grendel**

[10] In the story, Grendel repeatedly attacks this mead hall, the palace of King Hrothgar.

ANSWER: **Herot** or **Heorot**

[10] Both Grendel and the dragon are the focus of the work *Beowulf: The Monsters and its Critics*, a work by this 20th century British author.

ANSWER: John Ronald Reuel “J.R.R.” **Tolkien**

19 This theory was first developed by Linus Pauling to explain the structure of methane. For 10 points each:

[10] Name this theory which describes how atomic orbitals mix to form new orbitals that better describe the molecule. In the case of methane, the molecule will contain four sp3 bonds.

ANSWER: orbital **hybridization** theory

[10] Hybridization theory typically uses electrons from these bonds that form from the overlap of two p orbitals. A double bond contains a sigma bond and one of these bonds.

ANSWER: **pi** bond

[10] VSEPR theory, along with hybridization theory, explains how sulfur tetrafluoride obtains this shape, which occurs when a central atom is bonded to four other atoms and has a lone pair of electrons.

ANSWER: **see-saw**

20 One painting by this artist shows his friend on a row boat on the Schuylkill River. For 10 points each:

[10] Name this artist of *The Swimming Hole* and *Max Schmitt in a Single Scull*.

ANSWER: Thomas **Eakins**

[10] Eakins also painted this work that showed the title doctor lecturing a group of students at Jefferson Medical College.

ANSWER: *The* ***Gross Clinic***

[10] In his early career, Eakins studied under this photographer; an early developer of motion picture who showed that all four of a horse’s hooves leaves the ground at the same time while it is galloping.

ANSWER: Eadweard **Muybridge**

**Tiebreaker Bonus**

21 Scientists typically use 96,500 as an estimate for this quantity when performing calculations. For 10 points each:

[10] Name this constant equal to the charge of a mole of electrons.

ANSWER: **Faraday**’s constant (prompt on “F”)  
[10] Faraday’s constant appears in this equation used to calculate the reduction potential of a half cell.

ANSWER: **Nernst** equation

[10] Faraday’s constant was determined in an experiment involving this metal, used to test for aldehydes in Tollens’ reagent.

ANSWER: **silver**