**VHSL Regionals 2016-2017 - Round 06 - First Period, Fifteen Tossups**

1. This company is the target of a movement founded by the American homemaker Tami Canal. Disputed allegations claim that suicides in India increased after this company introduced a new product in 2002. Bayer offered to purchase this company for 66 billion dollars in September 2016. People in such countries as France and Spain have destroyed fields where this company grows GMO products. For 10 points, what controversial agrochemical company produces the herbicide Roundup?
ANSWER: **Monsanto** Company [or **Monsanto**-Bayer]

2. Massive amounts of this material were formed by a meteor impact at Popigai in Siberia. This material makes up over half of Botswana's exports. This material is found in so-called "pipes" of kimberlite, which is named for a South African city that was a major source of it. Antwerp, Belgium is a hub for cutting this material, which Cecil Rhodes's De Beers company specializes in distributing. Child soldiers in Sierra Leone controversially gathered, for 10 points, what incredibly hard, precious gems?
ANSWER: **diamond**s

3. This adjective describes "environments" that are used to manage dependencies in separate Python projects. In C++, this keyword specifies functions that need to be redefined in derived classes. Operating systems create this kind of "memory" through paging to allow processes to have more resources. Emulating a computer system can be done in this type of "machine". For 10 points, give this adjective that precedes the word "reality" in describing technologies that produce computer-generated simulations that seem life-like.
ANSWER: **virtual**

4. During this man's reign, twelve alleged leftist conspirators were executed in the High Treason Incident. This ruler put down the Satsuma Rebellion. A document laying out the goals of his reign said "evil customs of the past shall be broken off" and was called the Charter Oath. He organized his country into 72 prefectures to end the daimyo system. For 10 points, name this emperor who took power after the fall of the Tokugawa Shogunate, the namesake of the 1868 restoration of the Japanese monarchy.
ANSWER: **Meiji** (MAY-jee) [or **Mutsuhito**]

5. In this novel, a group of missionaries accept a shunned woman who had four times given birth to twins. Earlier in this novel, the missionaries surprisingly accept a plot of land in the Evil Forest. The protagonist of this novel is exiled from his community after a gun he is holding explodes at a funeral and kills a man. The primary setting of this novel is the village of Umuofia, and it takes its title from the poem "The Second Coming." For 10 points, name this novel about Okonkwo by Chinua Achebe.
ANSWER: ***Things Fall Apart***

6. The efficiency of a Carnot (CAR-noe) engine is equal to one minus a ratio of two examples of this quantity. The rate of change in this quantity for an object is equal to minus a constant k times this quantity for the object minus this quantity for the surrounding environment, according to Newton's law. The negative gradient of this quantity appears in Fourier's law of heat conduction. A difference in this quantity is equalized by heat transfer until a system is in thermal equilibrium. For 10 points, what quantity is measured in Celsius and Fahrenheit?
ANSWER: thermodynamic **temperature** [or **T**]

7. This dynasty attempted to modernize its military with the Self-Strengthening Movement. The final ruler of this dynasty, Puyi, later became the so-called "Emperor of Manchukuo (MAN-choo-KWO)." Its leaders required people to wear a hairstyle called the "queue," which featured a shaved forehead and ponytail. The Boxer Rebellion occurred during this dynasty, which was opposed by revolutionaries such as Sun Yat-sen, who overthrew it in 1912. For 10 points, name this last imperial dynasty of China.
ANSWER: **Qing** Dynasty [or **Manchu** Dynasty; or Empire of the Great **Qing**; do not accept "Qin Dynasty"]

8. In this location, an apple tree bears wish-granting fruit, but the wish will be fulfilled in such a way as to make it extremely distasteful. A prophecy about the future of this location will come true when two Sons of Adam and two Daughters of Eve are able to occupy a set of thrones at the castle of Cair Paravel. The Pevensie children journey to this location, where they cause the downfall of the White Witch. For 10 points, name this realm, the setting for much of *The Magician's Nephew* and *The Lion, the Witch and the Wardrobe*.
ANSWER: **Narnia**

9. In a play by this author, the title British monarch is killed by a representation of the Devil named Lightbourne. This author wrote a play in which Abigail is shunned by her father when she converts to Christianity and joins a convent. This author of *Edward II* wrote a play in which the title merchant is dropped into a boiling cauldron and a play in which the title scholar sells his soul to Mephistophilis. For 10 points, name this Elizabethan playwright of *The Jew of Malta* and *Doctor Faustus.*
ANSWER: Christopher **Marlowe**

10. Nelson Rockefeller's brother, Winthrop, was governor of this state. In this state, a teenager named Minnijean Brown was suspended for splashing two youths with chili. Dwight Eisenhower took control of the National Guard here to defeat the plans of Governor Orval Faubus. The 101st Airborne Division was called into this state in 1957 to escort several children to school. For 10 points, what state featured a civil rights crisis when nine black students enrolled in Little Rock Central High School?
ANSWER: **Arkansas**

11. A whip crack begins this composer's jazz-influenced Piano Concerto in G major. In order to out-do the difficulty of Mily Balakirev's *Islamey*, this composer wrote the "Scarbo" movement of his piano suite *Gaspard de la nuit* (gah-SPAHR day lah NWEE). *Pavane (pah-VAHN) for a Dead Princess* is by this composer, who is best-known for an orchestral piece in which the same two melodies are repeated again and again over a repetitive snare drum rhythm. For 10 points, name this French composer of *Boléro*.
ANSWER: Maurice **Ravel** [or Joseph Maurice **Ravel**]

12. This author insisted that the *taupou* (taw-POO) system only applied to those of high rank in a certain society. Derek Freeman argued this person was "hoaxed" into producing "an anthropological myth," claiming this author's subjects were far less sexually active than she believed. Her best known book was a study of adolescent girls on the island of Ta'u (TOWW). For 10 points, name this anthropologist, the author of the book *Coming of Age in Samoa*.
ANSWER: Margaret **Mead**

13. A relatively unsuccessful show featured this actor as the father of an autistic boy who can see future events through numbers. This man previously played a character whose wife was murdered the same day he was trying to protect Senator David Palmer. He currently plays a former Cabinet member promoted after the President is killed during the State of the Union address. For 10 points, what man currently plays the President on the show *Designated Survivor* and previously played Jack Bauer (BOWW-er) on *24*?
ANSWER: Kiefer **Sutherland**

14. From the dispersion relation of these phenomena, one can derive their group and phase velocity. Nodes are static points for the "standing" type of these phenomena. If these phenomena are out of phase by 180 degrees, they will interfere destructively. Though mechanical examples of these phenomena can be longitudinal, all electromagnetic ones are transverse, including radio and infrared. For 10 points, what oscillatory phenomenon have an amplitude defined as the difference between their crest and trough?
ANSWER: **wave**s

15. This material comprises the artifact dubbed the Mask of Agamemnon. In antiquity, the Pactolus River was held to be a bountiful source of this material. Some objects made of this material were guarded by the hundred headed dragon Ladon and by the Hesperides (hess-PER-id-eez), and they were the subject of the eleventh labor of Heracles. A Phrygian (FRIDGE-ee-unn) ruler was granted the ability to create this material after showing hospitality to Silenus. For 10 points, name this precious metal created by the touch of King Midas.
ANSWER: **gold** [or **gold**en apples]

 **VHSL Regionals 2016-2017 - Round 06 - Directed Period**

1A. Which Serbian-American promoted the use of alternating current for electricity distributions?
ANSWER: Nikola **Tesla**

1B. How many syllables are in both the first and the final lines of a Haiku?
ANSWER: **five**

2A. What 1915 film directed by D.W. Griffith infamously depicted the Ku Klux Klan as heroes?
ANSWER: *The* ***Birth of a Nation*** [prompt on *The Clansman*]

2B. What state capital is connected to college town Cambridge by bridges that cross the Charles River?
ANSWER: **Boston**, Massachusetts

3A. This is a 20-second calculation question. Triangle ABC is a right triangle with vertex A at the origin, vertex B at zero, comma six and vertex C at minus seven, comma zero. What is the tangent of angle BCA?
ANSWER: **six-sevenths** [or **six over seven**; do not accept "minus six-sevenths"] [side AC is adjacent and has length seven while side AB is opposite has length six]

3B. This is a 20-second calculation question. If a female fly with genotype capital-A, lowercase-a, capital-B, lowercase-b is crossed with a male fly with genotype capital-A, lowercase-a, lowercase-b, lowercase-b, and A and B are unlinked, what proportion of the offspring will be lowercase-a, lowercase-a, lowercase-b, lowercase-b?
ANSWER: **1/8** [or **2/16**; or 0**.125**; or **12.5** percent; the gametes produced by the female are AB, Ab, aB, and ab, and those produced by the male are Ab and ab, so the possible combinations for offspring are AABb, 2 AaBb, AAbb, 2 Aabb, aaBb, and aabb]

4A. A children's game provides the title of what Kurt Vonnegut novel partially set in the country of San Lorenzo?
ANSWER: ***Cat's Cradle***

4B. In what modern-day country did Louis Riel (ry-ALL), a leader of the Metis (MAH-tee) people, stage the 1869 Red River Rebellion?
ANSWER: **Canada**

5A. Both French king Louis VII and English king Henry II were married to Eleanor, a duchess from what French region?
ANSWER: **Aquitaine** [or **Aquitania**]

5B. Which Transcendentalist author wrote essays such as "Self-Reliance" and "The Over-Soul"?
ANSWER: Ralph Waldo **Emerson**

6A. The exploits of the Hero Twins were told by what people in their collection of mythology the *Popol Vuh*?
ANSWER: **Maya**ns [or Quiche **Maya**ns]

6B. Cherenkov radiation has a bluish hue because particles are exceeding what quantity for the medium in which they are traveling?
ANSWER: local **speed of light** [or **c**; do not accept "speed of light in a vacuum", as that is not possible]

7A. August Wilson is known for writing a cycle of plays including *Fences* and *The Piano Lesson* that are set in what American city?
ANSWER: **Pittsburgh**

7B. Friedrich Wohler accidentally synthesized what nitrogenous (ny-TRAW-jen-us) molecule found in urine and produced through a namesake cycle in the liver?
ANSWER: **urea**

8A. This is a 30-second calculation question. In terms of pi, what is the area of the circle with equation x squared plus y squared plus eight x minus six y minus thirty-nine equals zero?
ANSWER: **64 pi** [Putting the equation in normal form gives x-4² + y-3² = 64, so the radius is 8.]

8B. This is a 30-second calculation question. Let f of x equal two x-squared plus three x minus three and i be the square root of minus one. What is f of the quantity one plus i?
ANSWER: **7i** [f(1+i)=2(1+i)^2+3(1+i)-3=2\*2i+3+3i-3=7i.]

9A. In September 2016, what Miami Marlins pitcher died during a shocking boating accident?
ANSWER: Jose **Fernandez**

9B. The company Mylan was accused of "price gouging" after raising the price on what medical product to over $600 in May 2016?
ANSWER: **EpiPen** [or **epinephrine autoinjector**]

10A. In 1914, Archduke Ferdinand was killed in what city, which would trigger World War One?
ANSWER: **Sarajevo** (SARE-ee-ay-VOH)

10B. What urban sport involving climbing and leaping off buildings takes its name from a French word meaning "a route"?
ANSWER: **parkour** [or **parcour**s]

 **VHSL Regionals 2016-2017 - Round 06 - Third Period, Fifteen Tossups**

1. Mormons believe this man became immortal, because of an ambiguous reference in the New Testament. He is believed to be the otherwise unidentified "Beloved Disciple." This man and his brother, James, were known as the "Sons of Thunder." Thought to also be the author of the Book of Revelation, his namesake book is noted for being the only non-synoptic Gospel. For 10 points, what apostle of Jesus is believed to be the author of the fourth Gospel, following Matthew, Mark, and Luke?
ANSWER: **John** [or **John** the Apostle; or **John** the Evangelist; or **John** of Patmos; or the **Beloved Disciple** until it is read]

2. The president of this country told James Creelman he would not run for re-election in 1910. U.S. Ambassador Henry Lane Wilson is believed to helped plot a coup (KOO) during this country's Ten Tragic Days. Germany sent this country the Zimmermann Telegram during World War One. After the town of Columbus was raided, John Pershing was sent on a punitive expedition into this country. For 10 points, the U.S. unsuccessfully entered what country to capture the revolutionary Pancho Villa (VEE-uh)?
ANSWER: **Mexico** [or United **Mexican** States]

3. This band attached a Chopin nocturne to the end of their song "United States of Eurasia." Teddy bears destroy a miniature city in a music video by this band in which they declare "It's time the fat cats had a heart attack." A cover of "Feeling Good" appears on this band's album *Origin of Symmetry*. This band's 2015 album includes many analogies to drone warfare, particularly in the songs "Reapers" and "Psycho." For 10 points, name this band led by Matthew Bellamy, who performed the song "Uprising."
ANSWER: **Muse**

4. This ruler introduced a paper currency called the "chao" (CHOW). This man won a civil war to succeed his older brother Mongke as leader of his people. He unified the empire by destroying the remnants of the Song dynasty. According to some accounts, the first Europeans this ruler met were Marco Polo's father and uncle. In 1274 and 1281, this ruler's forces failed to conquer Japan, possibly due to storms referred to as "kamikazes" (COMM-ee-KOZZ-ees). For 10 points, name this grandson of Genghis Khan and founder of the Yuan dynasty.
ANSWER: **Kublai** Khan [or **Shizu**; prompt on Khan]

5. A poem written in this language asks, "Tell me where, in which country, is Flora?" That poem in this language, "Ballad of the Ladies of Times Past," was included in the collection *The Testament*. Another poem in this language repeats, "There, there's only order," and is titled "Invitation to the Voyage." A poet who wrote in this language included the section *Spleen and Ideal* in his collection *The Flowers of Evil*. For 10 points, name this language used by Francois Villon (vee-YON) and Charles Baudelaire (boh-duh-LAIR).
ANSWER: **French**

6. During an altercation in this novel, a woman locks a door and throws the key into a fire to prevent two servants from providing aid to their master. In the frame story of this novel, Mr. Lockwood rents the estate of Thrushcross Grange and is told a story by the housekeeper, Nelly Dean. In this novel, Catherine Earnshaw decides to marry Edgar Linton despite her feelings for the foundling Heathcliff. For 10 points, name this novel titled for a house on the British moors written by Emily Bronte.
ANSWER: ***Wuthering Heights***

7. The magnetic moment of an electron can be expressed using this physicist's "magneton." This proponent of the Copenhagen interpretation had a debate about quantum mechanics with Einstein. He won a Nobel Prize for developing a model that explained Rydberg's formula and correctly predicted the emission spectra of hydrogen atoms. His model of the atom consists of circular electron orbits around the nucleus. For 10 points, name this Danish physicist.
ANSWER: Niels **Bohr**

8. A film in this genre won gangster film actor James Cagney an Oscar. Arthur Freed produced a classic movie in this genre set during the St. Louis World's Fair. The inventive Busby Berkeley worked in films in this genre such as *42nd Street*. A movie in this genre features a famous sequence where the protagonist jubilantly holds an umbrella during a storm. Gene Kelly, Fred Astaire, and Ginger Rogers were stars in this genre of films. For 10 points, *Singin' in the Rain* is a film in what tuneful genre?
ANSWER: **musical** [or **dance** film]

9. This man told Reginald of Piperno that "all that I have written seems like straw to me" In this man's most-read book, he explains such concepts as the argument of the first cause and the argument of the unmoved mover. He wrote a text that serves as a defense of Catholicism against Islam and Judaism. This author of *Summa (SOO-ma) contra Gentiles* wrote a 3,500 page book that contains the "five ways," which are arguments for the existence of God. For 10 points, name this author of *Summa Theologica*.
ANSWER: Thomas **Aquinas** [prompt on Thomas]

10. Because their exoskeleton is made from the same mineral as this rock, foraminifera fossils are often found in this rock. It must be distinguished from dolomite, which contains a high proportion of magnesium. The solubility of this rock in water leads to the creation of karst landscapes, a prominent example of which is the sinkhole-prone state of Florida. This rock's constituent minerals are calcite and aragonite, polymorphs of calcium carbonate. For 10 points, most caves are found in areas where the bedrock is what sedimentary rock?
ANSWER: **limestone**

11. Roto-vaping is used to remove these compounds from a sample by evaporation. In the context of chromatography, these substances are called eluents. Tetrahydrofuran, or THF, and dimethyl sulfoxide, or DMSO, are common polar examples of these substances, which thus promote the formation of ions. The denominator of molality, which is in units of kilograms, is the mass of this type of substance. This type of substance dissolves a solute, creating a solution. For 10 points, water is the "universal" example of what substances?
ANSWER: **solvent**s [or **eluent**s until it is read]

12. An element from this group is used in Schlenk lines to prevent air from contaminating sensitive chemical reactions. Neutron capture followed by alpha particle emission forms one of these elements from magnesium. These elements are bracketed in abbreviated electron configurations. A heavier example of these elements can form compounds with six fluorine atoms. For 10 points, name this group of unreactive elements, exemplified by helium.
ANSWER: **noble gas**es [or **inert gas**es; or **group 18**]

13. This monarch teamed with the Sardinians to fight the Austrians at the very bloody Battle of Solferino. His country was basically tricked into declaring war by the doctored Ems Dispatch. This ruler dispatched Baron Haussmann to renovate Paris. This man was captured at the Battle of Sedan during the disastrous Franco-Prussian War, which led to the creation of the French Third Republic. For 10 points, name this monarch during the Second French Empire, the nephew of a previous French Emperor.
ANSWER: **Napoleon III** [or **Louis-Napoleon** Bonaparte; or **Charles-Louis Napoleon** Bonaparte; prompt on Napoleon; prompt on Bonaparte]

14. A composer from this country wrote an opera where two people float in a barrel to the island of Buyan. A now-praised opera from this country was savaged at the time by such famous native composers as Cesar Cui (KWEE). Another composer from this country wrote an opera in which the Swan-Bird transforms a youth into an insect, leading to the playing of the "Flight of the Bumblebee." For 10 points, what country's operas include Rimsky-Korsakov's *The Tale of Tsar (ZAR) Saltan*?
ANSWER: **Russia** [or **Russian** Empire]

15. Footage of this volcano was used in scenes of the planet Mustafar in *Star Wars: Episode III*. In the 1990s, the town of Zafferana was saved by diverting the flow of lava from this volcano. The region of Catania benefits from the fertile soil provided by this volcano's eruptions. The philosopher Empedocles (EMM-ped-oh-KLEEZ) legendarily committed suicide by jumping into this volcano, which is located about 80 miles south of another volcano, Stromboli. For 10 points, name this tallest volcano in Europe, which can be found in eastern Sicily.
ANSWER: Mount **Etna** [or **Mongibello**]

 **VHSL Regionals 2016-2017 - Round 06 - Tiebreaker Questions**

1. A member of this family hired the astrologer Joan Quigley to determine what days for her husband should be avoided. That member of this family introduced the "Just Say No" anti-drugs campaign. The most famous member of this family was married to two actresses, Jane Wyman and Nancy Davis; that member was wounded by John Hinckley very early in his presidency. For 10 points, name this family which includes a former actor turned President, Ronald.
ANSWER: **Reagan** [or Nancy **Reagan**; or Ronald **Reagan**]

2. Carbon-thirteen and this nuclei are the most commonly used nuclei for NMR. Transference of the cation of this element forms the basis for the Bronsted-Lowry acid-base system. A chain of carbon atoms is bound to as many of atoms of this element as possible if it is saturated. Discovered by Hendry Cavendish, this element and oxygen were named by Antoine Lavoisier. This element requires one electron to be added or removed in order to have a full shell and its isotope with one extra neutron is called deuterium. For 10 points, what element has atomic number one?
ANSWER: **hydrogen**-one [or **protium**; or **H**]

3. In a play written in this century, supernatural events include a floating vase that is suspended before Ruth Condomine, who is later the target of a murder attempt by the vengeful ghost of Elvira. The play *Blithe Spirit* was written in this century, as was a play in which a woman says it is "not bloody likely" that she will walk across the park after an elevation in social status. In that play written in this century, phonetics professor Henry Higgins teaches the flower girl Eliza Doolittle. For 10 points, name this century in which George Bernard Shaw wrote *Pygmalion.*
ANSWER: **20th** century [or the **1900**s]

4. This object may have been based on a real structure found at Uppsala, as described by Adam of Bremen. Four stags that may represent the winds or the seasons feed here. Beneath this item lies a well where Uror, Verdandi, and Skuld live. Also beneath this structure there is the dragon Nidhogg (NEED-hoag), who receives messages from the squirrel Ratatosk. Odin once hung himself on this place for nine nights. For 10 points, name this structure supported by three long roots, the "world-tree" from Norse mythology.
ANSWER: **Yggdrasil** (YIGG-drah-SILL)

5. This instrument's popularity grew after the success of Coleman Hawkins, who recorded a famous version of "Body and Soul." A man who played this instrument had a style referred to as "sheets of sound" for its improvisational qualities. It was the main instrument played by a man nicknamed "Bird" and of the jazz musician who recorded *Giant Steps* and *A Love Supreme*. This was the primary instrument of Charlie Parker and John Coltrane. For 10 points, name this brass woodwind instrument.
ANSWER: **sax**ophone [or alto **sax**ophone or tenor **sax**ophone]

This is a 30-second computation question. Find the area of a triangle with side lengths of fifteen, thirteen, and four.
ANSWER: **24** [by Heron's Formula, the area is sqrt(16\*1\*12\*3)=sqrt(16)\*sqrt(36)=4\*6.]

Name the artist who used Ben-Day dots to reproduce scenes from comic books, such as *Drowning Girl* and *Whaam!*
ANSWER: Roy **Lichtenstein** [or Roy Fox **Lichtenstein**]