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

1. This person's trial was under the supervision of Bishop Cauchon (COW-shawn) and occurred the year after this person was sent to help lift a siege by the future king Charles VII. This person was canonized in 1920 after being burnt at the stake in 1431. This teenager claimed to see visions from God telling her to drive out the English. For 10 points, name this "Maid of Orleans (ORR-lee-OWN)," a French heroine during the Hundred Years War.
ANSWER: **Joan** of Arc [or **Jeanne** d'Arc]

2. Members of this group are required to submit monthly "Field Service Reports" or risk being labeled "irregular." The 1943 *Barnette* Supreme Court decision said that children from this group could not be forced to pledge allegiance to the flag. This denomination's members meet in Kingdom Halls and do not allow military service. For 10 points, the members of what Christian denomination pass out copies of *The Watchtower* door-to-door?
ANSWER: **Jehovah's Witnesses**

3. An argument in this movie results in the addition of a thirty five second pause to a simulation whose practitioners are revealed to have had many trial runs before their first success. The main characters of this movie are acquitted of human error after they encounter a flock of geese that causes dual engine failure at an altitude of less than 3,000 feet. For 10 points, name this 2016 movie about the Miracle on the Hudson that stars Tom Hanks as the title pilot.
ANSWER: ***Sully***

4. This actor played a character who asks "whaddya got?" after being asked what he is rebelling against. This star of *The Wild One* played Terry, a dockworker who stands up against a corrupt union boss and who tells his brother "I coulda been a contender" in the movie *On the Waterfront*. For 10 points, what actor memorably shouted "Stella!" when playing the male lead in the film version of *A Streetcar Named Desire*?
ANSWER: Marlon **Brando** [or Marlon **Brando** Jr.]

5. The eleventh person to hold this title was controversially selected by using the Golden Urn. The second-highest ranking title after this one replaces a word with "Panchen." The Nobel Prize-winning Tenzin Gyatso (GEE-ott-SOH) is the fourteenth man to hold this title, which is passed down to a youth believed to be the reincarnation of his deceased predecessor. For 10 points, what title is held by a Tibetan Buddhist monk currently in exile in India?
ANSWER: **Dalai** (DAH-lay) **Lama** [prompt on Lama]

6. A high-energy one of these entities looks like a dumbbell on the z-axis plus a torus in the x-y plane. Because the lanthanides and actinides are in a separate part of the periodic table, the number of electrons in these orbitals is what increases between groups two and thirteen. They can hold ten electrons, and their first set occurs in the third shell, with energy higher than 4s. For 10 points, name these orbitals that are first filled with electrons by the transition metals.
ANSWER: **d** orbitals [prompt on atomic orbitals]

7. In this novel, a judge destroys a letter that would have exposed one of his relatives as a supporter of Napoleon Bonaparte. The protagonist of this novel disguises himself as a corpse after being educated by the Mad Priest, Abbe Faria. After escaping from prison, its protagonist goes on a quest for vengeance against his former friends Fernand Mondego and Danglars. For 10 points, Edmond Dantes is the title character of what novel by Alexandre Dumas?
ANSWER: *The* ***Count of Monte Cristo***

8. A French system of this kind, developed in the 1970s, is called the TGV. The fastest examples of these systems utilize a technique called Maglev. A system of this kind called the Shinkansen makes use of vehicles nicknamed "bullet." Sergei Witte (VIT-tuh) oversaw the construction of one of these systems that connects Moscow to Vladivostok, the longest of its kind. For 10 points, identify these systems, whose main American example is Amtrak.
ANSWER: **rail** systems [or any answer mentioning **train**s]

9. In this process, a riboflavin derivative is reduced while succinate (SUX-"innate") is converted to fumarate (FUME-uh-rate). Malate (MAY-late) is oxidized in this cycle to make a four-carbon compound that bonds with acetyl (uh-SEE-tul) Co-A to form a namesake molecule. Two F-A-D-H and six N-A-D-H made in this cycle are later used in the electron transport chain. For 10 points, what cell respiration cycle follows glycolysis? (gly-"CALL"-uh-sis).
ANSWER: **Krebs** cycle [or **citric acid** cycle; or **TCA**; or **tricarboxylic acid** cycle; prompt on cell respiration before it is read]

10. All computable functions can be defined by applying the minimization operator to the five operators that possess the "primitive" form of this property. If a piece of code possesses the "tail" form of this property, it can be optimized into an iterative structure. The Fibonacci sequence and factorial function are computed using this property, which requires a base case to terminate. For 10 points, name this property of a program or a function in which they call themselves.
ANSWER: **recursion** [or **recursive** or primitive **recursive**]

11. A character in this novel imagines that a passing meteor is an omen representing Judgment Day. This novel begins with a woman being led from a prison to a scaffold for shaming. In this novel, Roger Chillingworth questions a woman about the parentage of her child, Arthur Dimmesdale dies after delivering a sermon on Election Day, and Hester Prynne is forced to wear an embroidered symbol of her adultery. For 10 points, name this novel by Nathaniel Hawthorne.
ANSWER: *The* ***Scarlet Letter***

12. A plague named for this ruler was documented in the *Secret History* of Procopius. This man compiled a law code called the *Corpus Juris Civilis*. The Nika Riots were directed against this ruler and began after races grew out of control at the Hippodrome. He dispatched Belisarius to recapture Rome from the Ostrogoths. For 10 points, construction on the Hagia (HIGH-ah) Sophia church began during the reign of what Byzantine ruler known as the "Great"?
ANSWER: **Justinian** I [or **Justinian** the Great]

13. A revolt against this dynasty was led by Zhang Jiao (JOWW), a Taoist (DOWW-ist) who claimed this dynasty had lost the mandate of heaven. Briefly interrupted by another dynasty led by Wang Mang, it faced the Yellow Turban Rebellion late in its reign. Already weakened, this dynasty ended around AD 220, which officially began the Three Kingdoms period. For 10 points, what Chinese dynasty lends its name to the country's majority ethnic group?
ANSWER: **Han** dynasty [or Western **Han**; or Eastern **Han**; or Former **Han**; or Later **Han**]

14. One of this man's poems, in which the speaker asks "who would not sing" for the title character, was inspired by the drowning of his Cambridge acquaintance Edward King. The line "When I consider how my light is spent" opens a sonnet about his blindness. An epic poem by this author of "Lycidas" attempts to "justify the ways of God to men" and describes the expulsion of Adam and Eve from the Garden of Eden. For 10 points, what English poet wrote *Paradise Lost*?
ANSWER: John **Milton**

15. A photograph shows a member of this family lying next to a teenage busboy named Juan Romero. Another photograph shows a very young member of this family saluting a procession as he stands next to his veiled mother. After the death of a member of this family, a photo was taken showing his widow on Air Force One watching his successor sworn in. For 10 points, these photographs depict the aftermath of the murders of Robert and John, members of what family?
ANSWER: **Kennedy** [or John **Kennedy**; or Robert **Kennedy**; or John **Kennedy** Jr.; prompt on JFK; prompt on RFK]

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

1A. Who was the Chief Justice of the Supreme Court during such decisions as *Gideon v. Wainwright* and *Miranda v. Arizona*, both of which gave greater rights to defendants and suspects?
ANSWER: Earl **Warren**

1B. In what novel by Sir Walter Scott does a knight returning from the Crusades rescue and then marry Rowena?
ANSWER: ***Ivanhoe***

2A. What two-word Latin phrase means "seize the day"?
ANSWER: **carpe diem** (car-PAY dee-EMM)

2B. What was the name of the Macedonian ruler who was the father of Alexander the Great?
ANSWER: **Philip** [or **Philip II**]

3A. This is a 20-second calculation question. In a school of 1000 students, 385 are taking a biology class, 475 are taking a chemistry class, and 110 are taking both. How many students are taking neither a biology nor chemistry class?
ANSWER: **250** students [The number who are taking one or the other is 385+475-110=750, so 250 are left out.]

3B. This is a 20 second calculation question. Find the real roots of the following polynomial: quantity x to the fourth, close quantity, minus one.
ANSWER: x = **1** and x = **-1** (or x = **plus or minus one**)

4A. What South African sprint runner is currently serving a six year prison sentence for the murder of his girlfriend?
ANSWER: Oscar **Pistorius**

4B. What Richard Wright novel is about Bigger Thomas, a young black man who kills a white girl named Mary Dalton?
ANSWER: ***Native Son***

5A. What sensation also called pruritus is a major symptom of poison oak exposure and other allergies?
ANSWER: **itch** [accept word forms]

5B. What rapper, fond of ending words with the suffix "-izzle," performed the number-one hit "Drop It Like It's Hot"?
ANSWER: **Snoop Dogg** [or Cordozar Calvin **Broadus**, Jr.]

6A. What island hundreds of miles east of North Carolina is the namesake of a "triangle" where ships supposedly disappear?
ANSWER: **Bermuda**

6B. Inducers and repressors bind to operators to regulate what structural gene clusters such as *trp* and *lac* ("lack") that are transcribed as a unit under a single promoter?
ANSWER: **operon**s

7A. Agatha Christie and Rex Stout were two authors who worked primarily in which literary genre?
ANSWER: **mystery** [or **detective** fiction]

7B. What American author depicted the California Gold Rush in such stories as "The Luck of Roaring Camp" and "The Outcasts of Poker Flat"?
ANSWER: Bret **Harte**

8A. This is a 30-second calculation question. What is the distance between opposite sides of a regular octagon with sides of length 4?
ANSWER: **4** **plus** **4** times the square **root** of **2** **(4+4sqrt{2})** [The distance is one side length and two leg lengths of isosceles right triangles with hypotenuse 4.]

8B. This is a 30-second calculation question. In simplified form, what is the tangent of 15 degrees?
ANSWER: **2 minus** the square **root** of **3** [Use the identity tan(x/2)=(1-cosx)/sinx with x=30: tan(15)=(1-sqrt3/2)/(1/2)=2-sqrt(3).]

9A. What Russian composer depicted ten paintings by Viktor Hartmann in his piano suite *Pictures at an Exhibition*?
ANSWER: Modest **Mussorgsky** [or Modest Petrovich **Mussorgsky**]

9B. What diverse ecosystems threatened by ocean acidification are constructed out of calcium carbonate secreted by namesake animals?
ANSWER: **coral reef**s [prompt on reef]

10A. In 1839, slaves on what ship revolted against their Spanish captors and gained their freedom in an 1841 Supreme Court case?
ANSWER: *La* ***Amistad***

10B. The Old Testament books named for what man and Nehemiah describe the return of the Jews from exile and the rebuilding of the temple and walls in Jerusalem?
ANSWER: **Ezra**

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

1. For an inferior good, the magnitude of this concept rises as the income of a consumer falls. For normal goods, the price elasticity of this concept is negative, which encapsulates a law of this concept stating that its quantity increases as the price of a good falls. For 10 points, identify this concept whose namesake curve is normally represented as a downward-sloping line on a price-quantity graph, the opposite of supply.
ANSWER: **demand** [or quantity **demand**ed]

2. Johnny Wyles' dying wish is to go to this object in a 2011 independent game named for it. The "Oath to Order" is played to stop a grinning form of this object from destroying the land of Termina in *The Legend of Zelda: Majora's Mask*. In the game *Destiny*, this object contains a map called "The Anomaly," which one can visit in its Mare Cognitum region. Gravity is significantly reduced while visiting, for 10 points, what location, which is Earth's natural satellite?
ANSWER: Earth's **Moon**

3. Satellite images show the sharp difference in the rate of this process between Haiti and the Dominican Republic. Demand for palm oil has increased the rate of this process in Indonesia, producing a haze that sometimes covers much of southeast Asia. This process, which is often performed using slash-and-burn methods, threatens the Amazon ecosystem. For 10 points, name this process in which massive groups of trees are destroyed.
ANSWER: **deforestation** [or equivalents that mention the clearing of **forest**s]

4. This organization issued the so-called "Nansen passports" to assist refugees. Based in Geneva, this group never succeeded in adopting Esperanto as its working language. It imposed ineffectual sanctions after Ethiopia was invaded by Italy. This group first met in January 1920, six days after the Treaty of Versailles (ver-SIGH) came into force. For 10 points, the United States never joined what peacekeeping organization, a precursor to the United Nations?
ANSWER: The **League of Nations** [or **LN**]

5. This person puts her hand over her mouth in a photograph taken during Operation Neptune Spear. Kevin McCarthy said this person was "unbeatable" but noted her falling poll numbers due to a "select committee" formed in 2014 to investigate the deaths of four Americans. FBI Director James Comey said she was "extremely careless" for her usage of a private email server she used while Secretary of State. For 10 points, name this 2016 Democratic nominee for President.
ANSWER: Hillary **Clinton** [or Hillary **Rodham**]

6. He is not Beethoven, but a series of four timpani beats begins this composer's *Concerto in F*. This composer often collaborated with his brother Ira, a lyricist with whom he wrote the song "I Got Rhythm." The soprano lullaby "Summertime" is the opening number of this composer's opera *Porgy and Bess*. This composer is best-known for a jazzy piece that begins with a clarinet trill and soaring glissando. For 10 points, name this composer of *Rhapsody in Blue*.
ANSWER: George **Gershwin**

7. A festival held in this city commemorated a deity whose coming and going from Hyperborea signaled the changing of the seasons. The Omphalos of this city was considered by many Greeks to be the center of the world. The Castalian Spring was located near this city. It held the Pythian Games, and it was where the massive serpent Python was slain by Apollo. For 10 points, name this location of an ancient oracle.
ANSWER: **Delphi**

8. This character debates whether to leave a message he wrote on a sycamore scroll on the bed of a relative. He trades a series of ill-gotten Sunday School memorization tickets to acquire a copy of the Bible from a local church. This character explores McDougal's Cave with his girlfriend, Becky Thatcher, leading him to discover a hoard of gold left by Injun Joe. For 10 points, name this friend of Huck Finn whose adventures title a novel by Mark Twain.
ANSWER: **Tom** Sawyer [or Tom **Sawyer**]

9. PDGF binding causes RTK monomers (MAW-no-merz) to dimerize (DY-muh-rize) and attach this group to each other's tyrosine (TY-ro-seen) residues. This group is added to proteins to activate or inhibit them by kinases (KY-nayces). Hydrolysis (hy-DRAW-luh-sis) of ATP releases an inorganic ion of this group. With sugar it forms the backbone of DNA. For 10 points, name this functional group consisting of four oxygens bonded to a phosphorus.
ANSWER: **phosphate**s [or ortho**phosphate**; or **HPO4-2-minus**; or hydrogen **phosphate**; or dihydrogen **phosphate**; or **H2PO4-minus**]

10. These structures are stained in G-banding. Duplexes of these structures are separated when separase cleaves cohesin. The M checkpoint makes sure spindle microtubules are properly attached to their kinetochores (kih-NET-uh-cores). Meiosis (my-OH-sis) one separates homologous ones to create haploid cells with only one set of these structures. For 10 points, name these nuclear structures made of tightly packaged DNA that in humans come in 23 types.
ANSWER: **chromosome**s [or sister **chromatid**s]

11. A brown gas is quickly formed when copper is reacted with this compound. Ammonia and oxygen are heated over a platinum catalyst and the product is dissolved to form this compound in the Ostwald process. A mixture of this compound and hydrochloric acid that can dissolve gold is aqua regia. This compound dissolves to give a proton and the nitrate ion. For 10 points, name this strong acid with formula H N O3.
ANSWER: **nitric acid** [or **H N O3** until it is read]

12. Physicists often represent this quantity as momentum squared over twice the mass. This quantity is conserved in elastic collisions, but not in inelastic collisions. The work done is equal to the positive change in this quantity, or the negative change in the counterpart to this quantity. This quantity is often defined as one-half mass times velocity squared. For 10 points, what quantity represents a system's energy of motion?
ANSWER: **kinetic** energy

13. This event arose after the Butler Act was deliberately violated by a man financed by the ACLU. At one point during it, a former presidential candidate was asked where Cain got his wife. The play *Inherit the Wind* is based on this historical event. During this event, defense attorney Clarence Darrow quizzed prosecutor William Jennings Bryan about the Bible. For 10 points, what 1925 legal case in Tennessee featured a man put on trial for teaching evolution?
ANSWER: **Scopes** trial [or Scopes **monkey** trial; or *The State of Tennessee v. John Thomas* ***Scopes***]

14. A period of peace in this poem is ended when a slave is caught stealing a valuable cup. In a scene from this poem, the blood from a dead creature causes the blade of a sword to melt into nothingness. A controversial translation of this poem was produced by Seamus Heaney. Its main character is given the sword Hrunting by Unferth, after which he dives underwater to slay his enemy's mother. For 10 points, name this Old English poem about a warrior who kills Grendel.
ANSWER: ***Beowulf***

15. Shortly before his death, this man was planning the "Poor People's Campaign" to demand an economic bill of rights. While in jail, he wrote that "injustice anywhere is a threat to justice everywhere." This man gave a speech in which he noted "I've been to the mountaintop," the day before he was killed in Memphis by James Earl Ray. For 10 points, name this civil rights leader who gave the "I Have a Dream" speech.
ANSWER: Martin Luther **King** Jr. [or **MLK**]

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

1. An author from this country created Richard Rowan in the play *Exiles*. In a riot-instigating play set in this country, Christy Mahon wins a donkey race. A dramatist from this country, Lady Gregory, was instrumental in founding its Abbey Theater. Plays that originated in this country include *The Playboy of the Western World* and *Juno and the Paycock*. For 10 points, name this country home to John Millington Synge and Sean O'Casey.
ANSWER: **Ireland**

2. This composer's Symphony Number 4 ends with a passacaglia finale based on a J.S. Bach cantata. This composer of the *Tragic Overture* received an honorary doctorate from the University of Breslau, and wrote the *Academic Festival Overture* in response. Critics derided his Symphony Number 1 as being "Beethoven's Tenth." For 10 points, name this composer of the *Hungarian Dances* who, with Bach and Beethoven, comprises the three "B"s of classical music.
ANSWER: Johannes **Brahms**

3. This quantity can be found by taking the double integral of a bounded two-dimensional region. This quantity is equal to pi times the semi-major axis times the semi-minor axis for ellipses. It can be calculated using the semiperimeter in formulas named for Brahmagupta and Heron. For 10 points, name this quantity equal to pi times radius squared for a circle and side length squared for a square.
ANSWER: **area**

4. A powerful businessman born in this modern-day state was named Lorrin Thurston. Leaders in this future state were forced to sign the Bayonet Constitution by a group of businessmen including Sanford Dole. This state was an independent republic when it was annexed by the U.S. in 1898. It was once led by a queen named Lili'uokalani (LIL-ee-uh-KUH-lonn-ee). For 10 points, name this modern-day state, which is an island in the Pacific Ocean.
ANSWER: **Hawaii** [or Kingdom of **Hawaii**; or Republic of **Hawaii**]

5. This man was brought to Chicago by his mentor, King Oliver. This musician's nickname may refer to his youthful habit of sticking pennies in his mouth. In 1964, he became the oldest performer to have a number one song with his version of "Hello, Dolly!" This jazz musician pioneered scat singing with his recording of "Heebie Jeebies." For 10 points, what legendary jazz trumpeter sang "What a Wonderful World" and was nicknamed "Satchmo"?
ANSWER: Louis **Armstrong** [prompt on Satchmo; prompt on Satchelmouth]

Let f(x) ("eff of x") be a function of the form A+Bsin(x) ("A plus B sine x"). Suppose that f of pi/6 ("pi over 6") is 7 and f of 3pi/2 ("3 pi over 2") is 1. What is f of 0?
ANSWER: **5** [Plugging in the given values of x gives the system of equations A+B/2=7 and A-B=1. The solution is A=5 and B=4, so f(x)=5+4sin(x). Then f(0)=5+4\*0=5.]

China is planting a "Great Green Wall" of trees to combat the expansion of what desert that also covers Mongolia?
ANSWER: **Gobi** Desert