**VHSL Regular Season 2016-2017 - Round 25 - First Period, Fifteen Tossups**

1. When this material is saturated, its structure can collapse due to liquefaction. Acidic examples of this material can be treated with lime. Erosion is a mechanism of pedogenesis, the process of creating this material. This material is generally divided into the O, A, B, and C horizons. Nutrient-rich forms of this material include loam and humus (HOO-muss). For 10 points, what loose material consisting of mineral and organic matter is the growth medium for plants?
ANSWER: **soil** [prompt on earth; prompt on dirt]

2. After forces from this modern-day country lost the Battle of Marignano (MAR-ee-NONN-no), it signed an "Eternal Peace" treaty. Its Catholics and Protestants fought the Kappel Wars, a conflict that killed a religious reformer from here, Huldrych (ULL-drick) Zwingli. After watching a battle in Italy, a man from this country conceived of the International Red Cross, which is now based here. For 10 points, what modern-day European country is divided into 26 cantons?
ANSWER: **Switzerland** [or the **Swiss** Confederation]

3. This character flies to the sun to deceive Uriel and get directions. In the first book of the epic poem he appears in, this character rises from a fiery lake and rallies his fallen troops. After being driven away from a garden by a host of angels, he returns and inhabits the body of a snake. For 10 points, name this character from John Milton's *Paradise Lost* who tempts Adam and Eve.
ANSWER: **Satan** [or **Lucifer**]

4. The Benguela (ben-GELL-ah) is one of these phenomena responsible for the fog that envelops the Namib (nah-MIB) Desert. Another of these phenomena named after Humboldt brings nutrients to the Galápagos through upwelling. One of these phenomena explains why parts of Europe are warmer than Canada, even though they are at the same latitude. For 10 points, name these phenomena exemplified by the Gulf Stream, which transport water through oceans.
ANSWER: ocean **currents** [prompt on Gulf Stream until it is read]

5. In this movie, a couple at a track meet alternate between cheering on their son and discouraging him from doing too well during his sprint. A spherical robot with tentacles called the Omnidroid appears in this movie. In this movie, Samuel L. Jackson voices Frozone, the best friend of the super-strong patriarch Bob. For 10 points, name this Disney/Pixar children's movie about the title family of superheroes.
ANSWER: *The* ***Incredibles***

6. This man defeated Royalist forces at the Battle of Carabobo. In his Admirable Campaign, he conquered provinces like Caracas. This man was the first president of Gran Colombia, a union of states who had opposed Spanish rule. He was succeeded as president of another country by his former lieutenant, Antonio Josè de Sucre (SOO-kray). For 10 points, what man known as the "Liberator" lends his name to a South American country?
ANSWER: Simón **Bolivar** [or Simón José Antonio de la Santísima Trinidad **Bolivar** y Palacios]

7. This man's purported last painting *Red, Silver, and Black*, a gift to his mistress Ruth Kligman, was authenticated in 2013. This artist's *Blue* is based on *Moby Dick*. This student of Thomas Hart Benton was married to fellow abstract expressionist Lee Krasner. For 10 points, name this painter of *Lavender Mist* and *Full Fathom Five*, many of whose paintings were created by dripping or throwing paint onto a canvas.
ANSWER: Jackson **Pollock** [or Paul Jackson **Pollock**]

8. At an event in this city, a man paid tribute to colleagues by quoting lyrics from the Stevie Wonder song "As." An official in this city remarked "we're hiring," urging people to "get off that protest line." A man hiding in a building at El Centro College in this city died when the police attached a bomb to a remote control robot. In this city, Micah Johnson opened fire near the end of a peaceful protest. For 10 points, in what Texas city were five police officers killed in 2016?
ANSWER: **Dallas**

9. After this event, both Walter Short and Husband Kimmel were removed from command. A code phrase in this event was "Tora! Tora! Tora!", which indicated it came as a complete surprise. The *USS Arizona* Memorial honors this event's dead. This event took place on a "date which will live in infamy," according to Franklin Roosevelt. For 10 points, what December 7, 1941, event was a sneak attack by the Japanese on a Hawaiian naval base?
ANSWER: attack on **Pearl Harbor** [prompt on Operation AI; prompt on Operation Z]

10. This substance is produced by the parotid (puh-RAW-tid) gland. Polysaccharides (poly-SAK-uh-rides) like glycogen (GLY-kuh-jen) are broken into smaller components like maltose in this substance by the enzyme amylase (AM-uh-laze) during mastication. In leeches this substance has anticoagulants (anti-ko-AG-yu-lents). Namesake glands secrete this bodily fluid as a lubricant for the esophagus. For 10 points, name this bodily fluid produced in the mouth.
ANSWER: **saliva** [prompt on spit; prompt on mucus]

11. The Meselson-Stahl experiment was conducted using this organism labeled with nitrogen-15. Hershey and Chase found that DNA carries genetic material in an experiment in which they infected this organism with T2. A pathogenic strain of this organism is O157 H7. For 10 points, name this model bacterium in genus *Escherichia* (esh-uh-RICH-ee-uh) that lives in the gut and can sometimes cause food sickness.
ANSWER: ***E. coli*** [or ***Escherichia coli***]

12. In Mesopotamia, the god Sin represented this location. The wife of an archer who shot down nine suns went to live at this location. A rabbit mythically living here pounds out either the ingredients for rice cake or the elixir of life, serving a woman referred to as "bunny girl" by an employee of NASA. This location's goddess in Chinese mythology is Chang'e (CHONG-uh). For 10 points, what astronomical location's deities are frequently contrasted with solar deities?
ANSWER: the **Moon**

13. A mock-heroic poem in this collection recounts how Pertelote's (PAIR-tuh-loats) husband Chaunticleer escapes from the mouth of a fox. In another poem in this collection, Palamon and Arcite (ar-SEET) compete for the love of Emelye. This collection includes stories told by the Nun's Priest, the Knight, and the Wife of Bath. For 10 points, name this collection of poetic stories by Geoffrey Chaucer.
ANSWER: *The* ***Canterbury Tales***

14. J.S. Bach wrote a C major piece in this genre comprised entirely of mellow arpeggios in the right hand. A drone-like A-flat repeats throughout a Frédéric Chopin (SHO-pan) piece in this genre titled "Raindrop." A Bach keyboard collection pairs twenty-four of these pieces with twenty-four fugues, and a Claude Debussy tone poem pairs this term with the *Afternoon of a Faun*. For 10 points, name this genre of music which may serve to introduce another piece.
ANSWER: **prelude** [or **Präludium**; or **prélude**]

15. Two isothermal processes and two processes with no change in this quantity form the Carnot cycle. For a reversible process, the net change in this quantity is zero. Ludwig Boltzmann's tombstone features his equation for this quantity: Bolztmann's constant times the log of the number of microstates. It's always increasing according to the second law of thermodynamics. For 10 points, what thermodynamic variable, denoted S, is a measure of a system's disorder?
ANSWER: **entropy** [or **S** until it is read]

 **VHSL Regular Season 2016-2017 - Round 25 - Directed Period**

1A. What European country led by Prime Minister Viktor Orban built a fence in 2015 to prevent illegal immigration?
ANSWER: **Hungary**

1B. Jim Burden narrates what Willa Cather novel in which he befriends the title Bohemian girl?
ANSWER: ***My Antonia***

2A. What musical duo's album *Blurryface* includes their 2016 smash hit "Stressed Out"?
ANSWER: **Twenty One Pilots** [or **TØP**]

2B. What term is given to a character in a literary work who highlights the qualities of the main character by displaying contrasting characteristics and attitudes?
ANSWER: **foil**

3A. This is a 20-second calculation question. In simplest radical form, what is the sum of the square root of twenty-four and the quantity three times the square root of six?
ANSWER: **five times the square root of six** or **five radical six** or **five square root of six** or **five square roots of six**

3B. This is a 20-second calculation question. If a 45 degree arc of a circle has a length of 2 pi centimeters, in terms of pi, what is the area of the entire circle?
ANSWER: **64 pi centimeters-squared**

4A. An 1882 "exclusion act" severely limited immigration to the U.S. from what country, which had previously sent many railroad workers?
ANSWER: **China** [or Republic of **China**; do not accept "People's Republic of China"]

4B. Hadrian and Marcus Aurelius are traditionally placed in what group of Roman rulers noted for their successful and wise reigns?
ANSWER: **Five Good Emperors**

5A. In what type of wave is the displacement of the medium perpendicular to the direction of the wave?
ANSWER: **transverse** wave

5B. The Japanese words for "gentle art" give their name to what form of martial arts, which focuses on close combat without weapons?
ANSWER: **jujutsu** [or **jiu-jitsu**]

6A. According to the Stefan-Boltzmann law, intensity is related to temperature raised to what integer, which is also the number pi is multiplied in the denominator of Coulomb's law?
ANSWER: **fourth** [or **four**; or obvious equivalents]

6B. What African country was home to the ancient Christian kingdom of Axum and may have been the home of the biblical Queen of Sheba?
ANSWER: Federal Democratic Republic of **Ethiopia** [or **Ethiopia**n Empire]

7A. When dry ice melts, it undergoes what type of phase change, a transition directly from solid to gas?
ANSWER: **sublimation**

7B. What short poem by Lord Byron describes a woman who resembles "the night of cloudless climes and starry skies"?
ANSWER: "**She Walks in Beauty**"

8A. This is a 30-second calculation question. In a certain data set, only four values occur: 30, 40, 50 60. The frequencies of 30, 40, and 50 are 5, 15, and 10 respectively. If the mean of the data set is 50, find the frequency of 60.
ANSWER: **25**

8B. This is a 30-second calculation question. At what angles in radians between zero and pi does sine of theta equal one-fourth the cosecant of theta?
ANSWER: **pi/6** radians and **5pi/6** radians

9A. What Scottish philosopher examined the relation between cause and effect in his book *An Enquiry Concerning Human Understanding*?
ANSWER: David **Hume**

9B. Umberto Boccioni's ("botch"-ee-OH-neez) sculpture *Unique Forms of Continuity in Space* can be found at what New York City art museum, abbreviated the MoMA (moh-muh)?
ANSWER: Museum of **Modern Art**

10A. What Scottish writer created Dr. Watson and Sherlock Holmes?
ANSWER: Arthur Conan **Doyle**

10B. The Kenyan government often burns large piles of what hard, white substance to deter poachers?
ANSWER: **ivory** [prompt on tusks]

 **VHSL Regular Season 2016-2017 - Round 25 - Third Period, Fifteen Tossups**

1. A king of this country was killed by a sniper while inspecting trenches near Fredriksten. Another ruler of this kingdom was known as the "Lion of the North," who died fighting the Catholic League at the Battle of Lutzen. Under Charles XII, it won the Battle of Narva before suffering a major loss at Poltava against Peter the Great's army. For 10 points, what kingdom fought the Great Northern War with Russia and was once ruled by Gustavus Adolphus?
ANSWER: Kingdom of **Sweden** [or the **Swedish** Empire]

2. This quantity's third and fourth powers appear in the denominators of the skewness and kurtosis, respectively. For an element in a data set, the element minus mu over this quantity defines the standard score, or z score. In a normally distributed data set, approximately 95% of the data lies within two of these measures from the mean. It's the square root of the variance. For 10 points, what statistical measure is represented by sigma and quantifies the dispersion in a data set?
ANSWER: **standard deviation** [or **std**; or **sigma** until it is read; do not accept "sigma squared"]

3. The Gnostic gospel named for this person asserts that he was the only member of the "holy generation." According to one text, he committed suicide at Akeldama. This man questioned Mary's use of the ointment used to anoint Jesus's feet. Matthias replaced him after his death. This man received thirty pieces of silver for his best known action, in which he identified the man he followed by kissing him. For 10 points, name this apostle who betrayed Jesus.
ANSWER: **Judas** Iscariot

4. This author wrote about the Zembla native Charles Kinbote in a novel consisting largely of annotations to a 999-line poem by the fictional poet John Shade. In another of his novels, the scholar Humbert Humbert is obsessed with prepubescent girls he calls "nymphets," like his daughter-in-law Dolores. For 10 points, name this Russian-American author who wrote *Lolita*.
ANSWER: Vladimir **Nabokov** (nah-BO-koff)

5. In one video game made for Microsoft Windows and this console, the player solves puzzles on an island designed by Jonathan Blow. *The Witness* was made for this console, as well as the voxel-based game *Resogun*. A sequel subtitled "A Thief's End" and starring Nathan Drake, *Uncharted 4*, was also released for this console. For 10 points, name this console released in 2013 by Sony, which competes with Microsoft's Xbox One.
ANSWER: **PS4** [or **Playstation 4**; prompt on Playstation]

6. In this novel, while pretending to be the Comte de Wardes, the protagonist discovers a fleur-de-lis on a woman's shoulder, identifying her as a criminal. When Cardinal Richelieu's (REE-shuh-loos) men attempt to arrest this novel's protagonist for dueling, he ends up fighting on the side of Athos, Porthos, and Aramis (uh-RAHM-is). For 10 points, name this novel about d'Artagnan (dar-TAHN-yin) written by Alexandre Dumas (doo-MAH).
ANSWER: *The* ***Three Musketeers*** [or *Les* ***Trois Mousquetaires***]

7. This country's National Assembly meets in a building designed by Jørn Utzon. A road that runs between this country and a neighboring country's city of Basra featured numerous destroyed vehicles. Much of this country became uninhabitable after hundreds of oil wells were lit on fire by invaders in 1991. The U.S. led the response to Saddam Hussein's invasion of this country. For 10 points, name this small Persian Gulf country that borders Iraq and Saudi Arabia.
ANSWER: **Kuwait** [or State of **Kuwait**; or Dawlat al-**Kuwait**]

8. In one creation myth from this continent, a god emptied a mollusk filled with soil onto the earth because it was too wet to support life. One mythological figure that originated from this continent broke a pot containing all the world's wisdom and was the keeper of the world's stories. For 10 points, name this continent whose natives believed in the Yoruban creator god Olodumare (oh-loh-due-MAH-ree) and the spider god Anansi.
ANSWER: **Africa**

9. In a novel by this author, Sir Danvers Carew is beaten to death with a cane while carrying a letter for John Gabriel Utterson. The protagonist of a novel by this author finds a map in a chest belonging to Billy Bones. This author created a physician with an evil alter ego in his novel about Dr. Jekyll and Mr. Hyde. For 10 points, name this Scottish author of adventure novels such as *Treasure Island.*
ANSWER: Robert Louis **Stevenson**

10. A resolution condemning this group failed by one vote at the contentious 1924 Democratic National Convention. Its recruiters, known as "kleagles," tried to get people to join this "invisible empire." This group revived itself after the release of the film *The Birth of a Nation* in 1915, with its newer version also targeting Catholics, Jews, and immigrants. For 10 points, members of what white supremacist group wear hoods and burn crosses?
ANSWER: The **KKK** [or the **Klan**; or the **Ku Klux Klan**]

11. The Allan Hills meteorite found in Antarctica is thought to have originated from this astronomical body. The 19th-century astronomer Giovanni Schiaparelli (SCHOP-uh-RELL-ee) believed that there were *canali* on this planet, but that claim was later proven false. In 2015, NASA announced that there was evidence that water had once existed on this terrestrial planet. For 10 points, name the fourth planet from the Sun, known for its red color..
ANSWER: **Mars**

12. Salvador Dalí (dah-LEE) depicted this scene with the central figure on a hypercube. A menorah and depictions of pogroms surround a man wearing a prayer shawl instead of a loincloth in Chagall's version of this scene. The "yellow" central figure is surrounded by French peasant women in Gauguin's (go-GANS) version of this scene. For 10 points, name this scene in which the dying central figure typically wears a crown of thorns.
ANSWER: **crucifixion** of Jesus Christ

13. Soldiers from this country were killed in the Katyn (KAY-tin) Forest Massacre. In 2011, its president and 89 other officials from it were killed in a plane crash. A trade union in this country was founded by an electrician at the Lenin Shipyard. The leader of the Solidarity union, Lech (LECK) Walesa (WAH-len-SA), later became its president. For 10 points, what European country's invasion by Germany marked the official beginning of World War II?
ANSWER: Republic of **Poland**

14. After this man's death, Helen Codere edited his ethnographic work about the Kwakiutl (KWAH-coot-ULL) peoples of British Columbia. This man argued against scientific racism, explicitly denying that black people are inherently less intelligent in his book *The Mind of Primitive Man*. While teaching at Columbia, this man supervised the work Alfred Kroeber and Ruth Benedict. For 10 points, name this German immigrant called the "father of American anthropology."
ANSWER: Franz **Boas**

15. According to its units, the *x* in e to the i *x* is this type of argument. Hyperbolic functions take a real number that is this type of value as an input. In polar coordinates, each point is defined by a distance and one of these values. It's impossible to use a compass and straightedge to trisect this type of value. Supplementary and complementary examples of them sum to 180 and 90, respectively. For 10 points, what values can be acute or obtuse and are measured in degrees?
ANSWER: **angle**s

 **VHSL Regular Season 2016-2017 - Round 25 - Tiebreaker Questions**

1. Before he moved to Los Angeles, Ray Charles recorded his first hit songs in this city. The Milwaukee Brewers baseball team used to play in this city as the Pilots. An over 600-foot structure in this city contains the SkyCity restaurant. The aircraft company Boeing was founded in this city, which is also where Amazon has its corporate headquarters. For 10 points, name this city, the home of the Space Needle and the largest in the state of Washington.
ANSWER: **Seattle**

2. In this story, a woman asks her son to drive the family to a house from her childhood before remembering the house was actually in Tennessee. The title observation of this short story is made by the diner owner Red Sammy. A car crash in this story is caused by the cat Pitty Sing. In this story, a criminal called The Misfit murders the grandmother and her family. For 10 points, name this short story by Flannery O'Connor.
ANSWER: "A **Good Man Is Hard to Find**"

3. A diagnostic technique for a form of this disease uses the mnemonic (nih-MON-ik) "ABCDE". The most common type of this disease is basal cell carcinoma (car-sih-NO-ma). Large, irregularly-shaped moles are often removed to prevent the worst form of this disease, and risk for it is increased by tanning. For 10 points, melanoma is the most serious form of what disease affecting the largest organ in the body?
ANSWER: **skin cancer** [or **skin carcinoma**; or **melanoma** before "basal" is read]

4. This composer quoted the "Day of Wrath" Gregorian chant in his *Totentanz*. He wrote slow pieces such as "Un sospiro" and "Liebestraum (LEE-buss-TROWM) No. 3", but was a skilled pianist whose concerts drove admiring fans into his namesake "mania." His country's traditional Roma music inspired this composer to write a piano collection whose second piece is often featured in cartoons. For 10 points, name this composer of the *Hungarian Rhapsodies*.
ANSWER: Franz **Liszt** [or **Liszt** Ferenc]

5. During this period, Hiram Revels was elected as an U.S. Senator. It officially ended after the compromise that ensured Samuel Tilden lost the presidency to Rutherford B. Hayes. Thaddeus Stevens and Republicans promoted the "radical" version of this period. During this period, the Freedmen's Bureau and "carpetbaggers" tried to provide education. For 10 points, what period featured attempts to aid freed slaves in the south following the Civil War?
ANSWER: **Reconstruction** [or Radical **Reconstruction**]

" What is the smallest positive value of x at which there is a vertical asymptote of the function "secant of x?"
ANSWER: x = **pi/2** [or **90 degrees**]

The headquarters of CNN and Coca-Cola are both found in what southeastern U.S. city?
ANSWER: **Atlanta**, Georgia