**VHSL Regionals 2016-2017 - Round 03 - First Period, Fifteen Tossups**

1. Dorothy Sayers considered her finest literary output to be a translation of this author. This writer's poem beginning, "Love, that speaks to me within my mind," is discussed in his four-book *Convivio*. The second part of an epic poem by this man is set on an island mountain that is the only land in the Southern Hemisphere. The planets correspond to the spheres of heaven in a poem by this man in which he is guided by his beloved, Beatrice. For 10 points, name this Italian poet whose *Divine Comedy* includes *Paradiso*, *Purgatorio*, and *Inferno*.
ANSWER: **Dante** Alighieri [or Dante **Alighieri**]

2. Self-intersecting examples of these objects with symmetrical "spikes" are classified as their "star" type. The Euler (OY-ler) characteristic for any convex examples of these objects is two. The dual of one of these objects has faces in place of the original's vertices, but the same number of edges. There are five regular, convex examples of these objects called the Platonic solids. For 10 points, what class of solid figures is characterized by flat, polygonal faces and include cubes and prisms?
ANSWER: **polyhedra** [or **polyhedron**s; prompt on solids]

3. In a play by this man, two characters contrast the ideas of "talking" and "speaking" about something while sitting in a Chinese restaurant. This author created Don, a junk shop owner who wants to steal a valuable buffalo nickel he sold to a customer. In this man's best known play, Ricky Roma and Shelley Levene are part of a group of profane real estate salesmen desperately trying to get the "leads." For 10 points, name this author of the plays *American Buffalo* and *Glengarry Glen Ross*.
ANSWER: David **Mamet** (MAH-met)

4. During this event, the first recipient of the Air Force Cross was killed. That man, Rudolf Anderson, was the only casualty during this event. It was resolved when the U.S. agreed to dismantle weapons deployed in Turkey and Italy, and it also resulted in the creation of a "hotline" to allow direct communication between Washington and Moscow. For 10 points, what October 1962 event featured the U.S. and Soviet Union clashing over weapons placed on a Caribbean island?
ANSWER: **Cuban Missile** Crisis [prompt on October Crisis]

5. These people won a dominant victory at the Battle of the Kalka River and built a capital called Sarai on the Volga River. These people never conquered Novgorod, but forced the Grand Prince of Vladimir to serve as a tax collector. Europeans called both them and Turks "Tatars" (tar-TARS). In the thirteenth century, these people invaded and destroyed Kiev, Moscow, and other Russian cities. For 10 points, the Golden Horde originally consisted of what Asian people led by Batu Khan?
ANSWER: **Mongol**s [or the **Golden Horde** until it is read; or **Tatar**s until it is read]

6. Many artists who used this medium worked for Roy Stryker, the head of a division at the Farm Security Administration. This medium was the primary one used by Margaret Bourke-White. Another female artist in this medium depicted Florence Owens Thompson while she was finding shelter at a pea-pickers' camp in California. For 10 points, Dorothea Lange used what artistic medium to depict a nervous "Migrant Mother" and her children during the Great Depression?
ANSWER: **photo**graphy

7. This book's line "come now, let us reason together" was frequently quoted by Lyndon Johnson. It is the first book to use the metaphor "beat swords into plowshares." The "suffering servant" songs in this book seem to anticipate Jesus Christ, and John the Baptist quoted its line about "a voice crying in the wilderness." This book predicts that a maiden "will bear a son and will call his name Immanuel." For 10 points, what Old Testament book is, in English Bibles, the first book of the major prophets?
ANSWER: Book of **Isaiah** [prompt on the Bible]

8. This man changed his methods after being given advice by Nate Boyer. This man noted that both Donald Trump and Hillary Clinton were "proven liars" shortly after Trump suggested he find "a country that works better for him." Trent Dilfer said this man's "job is to be quiet" and that his actions "disrupted the organization." This man claimed he would not "show pride in a flag for a country that oppresses black people and people of color." For 10 points, name this quarterback who refused to stand for the national anthem during 2016 games.
ANSWER: Colin **Kaepernick** (CAPP-er-NICK)

9. An island of this name is separated from the mainland by the Dolphin and Union Strait, which caribou cross during the summer. A lake that hosts an invasive population of water hyacinth shares this name with the chief port of the Seychelles (SAY-shells). John Hanning Speke (SPEAK) gave this name to a lake that he determined to be the source of the Nile River. Canada's second-largest island and the capital of British Columbia share this name. For 10 points, give this name of a long-reigning British queen in the 19th century.
ANSWER: **Victoria**

10. A team in this state once traded eight draft picks in order to draft Ricky Williams. Before winning at Alabama, Nick Saban won his first college football championship with a team in this state. Many players and coaches for a pro team in this state were suspended after the "Bountygate" scandal. A college football team in this state recently fired longtime coach Les Miles. Drew Brees is the quarterback for the NFL team here. For 10 points, what state is the home of the New Orleans Saints?
ANSWER: **Louisiana**

11. This deity was so angry at a Libyan queen named Lamia that this deity forced Lamia to eat her own children. After the Greek conquest of Persia, this deity was often depicted in a chariot drawn by peacocks. The jealousy of this deity caused her to curse Echo to only be able to repeat what has already been said. Along with Aphrodite and Athena, this goddess participated in a beauty contest judged by Paris. For 10 points, name this wife of Zeus, the chief female deity of the Greek pantheon.
ANSWER: **Hera** [or **Juno** or **Iuno** until "Greek" is read]

12. After losing to this commander, the Russian Alexander Samsonov killed himself. He won the 1914 Battle of Tannenberg with his staff-officer, Erich Ludendorff. The burning of the Reichstag (RIKE-stog) occurred when this man was president and he appointed Adolf Hitler the Chancellor of Germany. This man is the namesake of a thing destroyed at Lakehurst, New Jersey, prompting a reporter to shout "Oh, the humanity!" For 10 points, name this German leader, the namesake of a zeppelin destroyed in a 1937 accident.
ANSWER: Paul von **Hindenburg** [or Paul Ludwig Hans Anton von Beneckendorff und von **Hindenburg**]

13. Modified Newtonian Dynamics is an attempt to solve the galaxy rotation problem without resorting to this idea. This idea was first proposed after observations of the Coma cluster by Fritz Zwicky (FRITS TSVIK-ee). The Lambda-CDM model of cosmology is named for the cosmological constant and the "cold" type of this substance. This substance gets its name from the fact it doesn't interact with the electromagnetic force. For 10 points, what hypothetical substance may constitute most of the mass in our universe, but would not be as abundant as a similarly named "energy"?
ANSWER: **dark matter**

14. The protagonist of this novel discovers a lever while rummaging through a museum he names the Palace of Green Porcelain. In this novel, the childlike Weena nearly drowns in a river analogous to the Thames. The society depicted in this novel is divided into a mild-mannered group called the Eloi, and the subterranean-dwellers who make goods for them, the Morlocks. For 10 points, name this novel whose protagonist uses the title contraption to travel to the year 802,701 AD, a work of H. G. Wells.
ANSWER: *The* ***Time Machine***

15. Some of these structures become coated in their Xist ("exist") gene's transcript. Mary Lyon discovered that some of them are randomly methylated (METH-uh-lay-ted) during development. These structures are duplicated in Klinefelter syndrome. Their "inactivation" produces Barr bodies. Recessive disorders carried on them, like hemophilia, usually only affect males. For 10 points, name this sex chromosome doubled in women.
ANSWER: **X** chromosome

 **VHSL Regionals 2016-2017 - Round 03 - Directed Period**

1A. What Italian author used Kabbalistic (kah-bah-LIST-ik) schemas in his novel *Foucault's Pendulum*?
ANSWER: Umberto **Eco**

1B. What campaign in China from 1958 to 1961 involved rapid industrialization and is believed to have played a role in causing a major famine?
ANSWER: **Great Leap Forward**

2A. In the 19th century, the "gag rule" in Congress blocked the petitions of what movement, whose advocates included William Lloyd Garrison?
ANSWER: **abolition**ism

2B. A fifth of the world's petroleum passes through what strait that connects the Persian Gulf to the Gulf of Oman?
ANSWER: Strait of **Hormuz**

3A. This is a 20-second calculation question. What is the surface area of a regular tetrahedron with side length two?
ANSWER: **4** times the square **root** of **3** [or **4 times 3 to the one-half** power] [each of the 4 faces is a triangle with base 2 and height sqrt(3), so the total surface area is 4\*(1/2)\*2\*sqrt(3)=4sqrt(3).]

3B. This is a 20-second calculation question. If two cards are drawn *without replacement* from a standard fifty-two-card deck, what is the probability they are both diamonds?
ANSWER: **one over seventeen** [or **three over fifty-one**; or **12/204**] [since it is without replacement, we have 13/52 (equivalently, 1/4) for the first card and 12/51 for the second; those probabilities multiply]

4A. What laboratory apparatus, shaped like a tall, graduated pipette with a stopcock at the bottom, is used to slowly add liquid in a titration?
ANSWER: **burette**

4B. The Beatles remix album *Love* was the soundtrack to a show by what circus troupe founded in Montreal?
ANSWER: **Cirque du Soleil** [or **Circus of the Sun**]

5A. In Jean-Paul Sartre's (SAR-truss) play *No Exit*, Garcin (gar-SAN) defines what location as "other people"?
ANSWER: **hell** [or l'**enfer**]

5B. What infamous queen of Israel and wife of Ahab was noted for her support of false prophets and opposition to Elijah?
ANSWER: **Jezebel**

6A. The anti-derivative of the natural logarithm of x is what function, which is the multiplicative inverse?
ANSWER: y equals **one over x** [or y equals **x to the negative one** power; or obvious equivalents]

6B. *Finlandia* is a patriotic piece by what composer who depicted a mythical river of death in *The Swan of Tuonela*?
ANSWER: Jean **Sibelius** [or Johan Julius Christian **Sibelius**]

7A. What curve is the solution of the brachistochrone and tautochrone problems and is drawn by a point on the rim of a circle rolling along a line?
ANSWER: **cycloid**

7B. *Who's Afraid of Virginia Woolf?* is a play by what author whose first successful drama was *The Zoo Story*?
ANSWER: Edward **Albee**

8A. This is a 30-second calculation question. What is the sum of the solutions of the equation x-squared plus one equals zero and the solutions of the equation x-cubed minus x equals zero?
ANSWER: **zero** [the solutions are conjugate pairs, so their sum is 0]

8B. This is a 30-second calculation question. Solve for x in the equation: five minus three times the inverse tangent of x equals eight. Give your answer in radians in terms of pi, or in degrees.
ANSWER: **minus pi over 4** [or **minus 45** degrees; do not accept positive answers] [for the equation to be true, we need arctanx to be equal to -1, which happens at -45 degrees or -pi/4 radians.]

9A. One of the few genderless Indo-European languages is what language spoken in Iran?
ANSWER: **Persian** [or **Farsi**]

9B. What two Italian anarchists were convicted of robbery and murder and executed after an infamous 1921 trial?
ANSWER: Nicola **Sacco** and Bartolomeo **Vanzetti** [or Bartolomeo **Vanzetti** and Nicola **Sacco**]

10A. The election of various leaders in Latin America, such as the Kirchners in Argentina and Evo Morales in Bolivia, was a trend referred to as a "tide" of what color?
ANSWER: **pink**

10B. What term comes in dramatic and tragic varieties that involve a character possessing and then acting upon a lack of information of which the audience is aware?
ANSWER: **irony** [or dramatic **irony**; or tragic **irony**]

 **VHSL Regionals 2016-2017 - Round 03 - Third Period, Fifteen Tossups**

1. This particle's namesake mechanism is integral to electro-weak symmetry breaking. This particle was found by ATLAS to have a mass between 125 and 127 giga-electron-volts. This particle is the excitation of a namesake field proposed by a British physicist in 1960. This particle imparts mass to other particles and the search for this particle was a major reason the LHC was built. For 10 points, in 2012, CERN discovered what boson sometimes called the "God particle"?
ANSWER: **Higgs** boson

2. In the very last scene of a film in this series, a tribe of cannibals begins to worship a dog. A villain in two films in this series is the scheming businessman Cutler Beckett. Another character in this series had a father played by Keith Richards, asks the question "Savvy?" a lot, and was chased by Commodore Norrington. Will Turner and Elizabeth Swann first appeared in this series' debut film, *The Curse of the Black Pearl*. For 10 points, what film series stars Johnny Depp as Captain Jack Sparrow and is based on a Disney theme park ride?
ANSWER: ***Pirates of the Caribbean***

3. The speaker of a poem by this man requests, "let us melt, and make no noise" while addressing his lover, whom he compares to one leg of a compass. This author's *Devotions upon Emergent Occasions* includes a "Meditation" that asserts, "No man is an island, entire of itself." This poet of "A Valediction: Forbidding Mourning" wrote a series of fourteen-line poems whose tenth entry begins, "Death, be not proud." For 10 points, name this English metaphysical poet who wrote the *Holy Sonnets*.
ANSWER: John **Donne**

4. This President's longtime advisor was the businessman Mark Hanna. He ran for the presidency using a "front porch campaign" in which people would come to his home in Ohio. During this President's term, the U.S. annexed both Hawaii and the Philippines. This man twice defeated William Jennings Bryan for the presidency and was assassinated by an anarchist while at the Pan-American Exposition in 1901. For 10 points, name this U.S. President during the Spanish-American War.
ANSWER: William **McKinley**

5. This kingdom's longest-reigning monarch was a Danish prince named George. Its independence was secured by the naval Battle of Navarino, featuring British, French, and Russian ships. Alexander Ypsilantis (YIP-suh-LANT-iss) fought for this country's independence against the Ottomans as part of a conflict that featured the massacre at Chios (CHEE-ohs) and the participation of poets such as Lord Byron. For 10 points, what Mediterranean kingdom obtained Crete after the Balkan Wars?
ANSWER: Kingdom of **Greece** [or the **Hellenic** Republic]

6. A composer from this country wrote the motet "Spem in alium." A Baroque composer from this country wrote the aria "When I am laid in Earth" to close out his opera *Dido and Aeneas*. The Trumpet Voluntary is a popular wedding piece written in this country. For a riverside concert in this country, the German-born composer George Frideric Handel wrote *Water Music*, a commission from George I. For 10 points, name this country whose anthem is "God Save the Queen."
ANSWER: **England** [or **United Kingdom** of Great Britain and Northern Ireland; or **U.K.**; or Great **Britain**]

7. The electric form of this quantity per unit charge is voltage. The work done by a conservative force is the negative change in this quantity. Integrating Hooke's law gives you this quantity for a spring, equal to one-half k x-squared. The gravitational form of this quantity on Earth is equal to mass times little g times height. For 10 points, what quantity represents the stored energy of a system and is often contrasted with kinetic energy?
ANSWER: **potential** energy [or **U**]

8. This theory was later revised to an eight-stage model that included the concept of "transcendence" or helping others to succeed. This theory was first proposed in the essay "A Theory of Human Motivation" in 1943. In the visual concept of this theory, "self-actualization" is at the top, while "physiological" things like food and water are on the bottom. For 10 points, what psychological theory of Abraham Maslow proposes a pyramid of things that people require in their lives?
ANSWER: Maslow's **hierarchy of needs**

9. This painting was controversially covered so as not to appear in the background of a 2003 speech at the United Nations by Colin Powell. A light bulb at the top of this painting resembles a sinister eye. A woman appearing to float or peer into the setting of this painting carries a torch. Over 11 feet tall and 25 feet wide, this painting features such images as a gored horse and a bull, as well as many suffering people. For 10 points, what Pablo Picasso painting is titled for a city viciously bombed during the Spanish Civil War?
ANSWER: ***Guernica***

10. An unresolved conflict about land bordering this sea created an unclaimed territory called Bir Tawil. A plan to build the Bridge of the Horns at the southern end of this sea was proposed by Osama bin Laden's half-brother, Tarek. This sea is connected to the Gulf of Aden by the Bab-el-Mandeb, which borders the small country of Djibouti (juh-BOO-tee). In 1869, this sea was linked with the Mediterranean by the Suez Canal. For 10 points, name this sea that, according to some translations of the Bible, was parted by Moses.
ANSWER: **Red** Sea

11. The call stack was designed to store information about these things. Data can be fed into these things using the techniques of pass-by-reference or pass-by-value. The typical delineation between global and local variables has local variables declared inside one of these things. In C, the keyword void is used when these things do not take parameters. In object-oriented programming, these things are called methods when they are attached to a class or an object. For 10 points, what unit within a program is named for a mathematical relation that maps an input to an output?
ANSWER: **function**s [or sub**routine**s; or **procedure**s; or **method**s until it is read]

12. This philosophy is controversially applied to animals by Peter Singer. The founder of it also formulated a calculation known as the "felicific (FELL-eh-CIFF-ic) calculus." The modern form of this philosophy was founded by Jeremy Bentham and expounded in a namesake book by John Stuart Mill. It can be summarized by using the "greatest-happiness principle." For 10 points, what philosophy argues that the best moral action is one that maximizes positive value?
ANSWER: **utilitarianism** [prompt on hedonism]

13. The Pazzi conspiracy in this city targeted its ruling family. A priest in this city was excommunicated by Alexander VI for destroying things like mirrors and playing cards. Savonarola was killed in this city after previously calling for the "bonfire of the vanities." It was controlled by a banker named Cosimo and his grandson, Lorenzo the Magnificent, who was also a patron of artists like Michelangelo. For 10 points, what Italian city was dominated by the Medici (MED-uh-CHEE) during the Renaissance?
ANSWER: **Florence** [or the **Florentine** Republic]

14. The gradient of a function dotted with a vector v gives the "directional" variety of this operation along v. This operation applied to *f* times *g* yields *f* times *g* prime plus *g* times *f* prime, according to the chain rule. Applied to x-squared, this operation yields two x. Using Leibniz's notation, this operation for *f* of *x* is denoted by *d* over *d* *x* of *f* of *x*. For 10 points, what mathematical operation from calculus gives the instantaneous rate of change and is the opposite of integration?
ANSWER: **derivative** [or **differentiation**; or word forms]

15. The first biography of this author was written by Elizabeth Gaskell, who omitted details about an affair with Constantin Heger. The protagonist of a novel by this author declares "Reader, I married him," after rejecting a proposal from the missionary St. John (SIN-jin) Rivers. The title character of that novel by this woman discovers that the mad Bertha Mason is kept locked in the attic of her employer and eventual husband, Mr. Rochester. For 10 points, name this woman who wrote *Jane Eyre*.
ANSWER: **C**harlotte **Bronte** [prompt on Bronte]

 **VHSL Regionals 2016-2017 - Round 03 - Tiebreaker Questions**

1. A composer from this non-Russian country wrote the ballet *Bewitched Love*, which includes the "Ritual Fire Dance." Nikolai Rimsky-Korsakov wrote a *Capriccio* titled for this country and included in it an example of its fandango dance. In another style of dance from this country, female performers wear frilly red dresses while clacking castanets together, often accompanied by a guitar. This country's traditional music is often heard at its bullfights. For 10 points, name this Iberian country home to flamenco music.
ANSWER: **Spain** [or **España**; or **Kingdom of Spain**; or **Reino de España**]

2. This deity projects a dream to Nausicaa that causes her to travel to the shore to wash some clothes. This deity listens to a poetry recital by Phemius while disguised as Mentes, and later accompanies Telemachus to the court of Nestor under the name of Mentor. This deity magically brings about a peace between the former suitors of Penelope and Odysseus, ending her involvement in Odysseus's peaceful return to Ithaca. For 10 points, name this Greek goddess of wisdom.
ANSWER: **Athena** [or **Pallas** Athena]

3. While he did not actually fight in this country, the Duke of Marlborough achieved fame fighting in a war named for it. After ruling Naples and Sicily, Napoleon's brother, Joseph, became the king of this country. The death of Charles II kicked off a succession crisis and war in this country. It reached its peak under the Hapsburg ruler Charles V. For 10 points, Philip II ruled what European country, which sent a so-called "Invincible Armada" against England?
ANSWER: Kingdom of **Spain**

4. Left-handed materials cause this phenomenon to occur in a different direction than usual. When a quantity relating to this phenomenon is variable, birefringence can cause its "double" variety in materials such as calcite. The ratio of the direction of light from the normal is equal to the ratio of this phenomenon's indices for two different media according Snell's law. For 10 points, name this phenomenon in which light bends when passing into a different media.
ANSWER: **refraction**

5. Literary critic James Wood wrote a book titled "The Man Behind" this novel's title character. The protagonist of this novel uses the excuse of taking piano lessons to cover her trips to a hotel room for liaisons. In this novel, a woman commits suicide by swallowing arsenic from Monsieur Homais's (oh-MAYS) store after falling heavily in debt. Its title character has an affair with Leon Dupuis (doo-PWEE) to escape the boredom of her marriage to a doctor. For 10 points, name this novel by Gustave Flaubert (floh-BAIR).
ANSWER: ***Madame Bovary***

If theta is an angle in the fourth quadrant, and sine of theta equals minus seven over nine, what is the cotangent of theta?
ANSWER: **minus four** times the square **root** of **2 over 7** [or **minus** the square **root of thirty-two over seven**; or obvious equivalents, such as **negative** in place of "minus"] [the Pythagorean formula tells us the missing adjacent side is the square root of 81-49=32; cotangent is adjacent over opposite, and is negative in the fourth quadrant.]

Edwin Lutyens planned the capital of what country, home to a marble mausoleum built for the wife of Shah Jahan?
ANSWER: **India** [or Republic of **India**; or **Bharat** Ganarajya]