**2016 VHSL Regionals - Round 04 - First Period, Fifteen Tossups**

1. A story told in this religion discusses a farmer who responds to losing his horse, his son breaking his leg, and a visit from a military recruiter by repeatedly saying "maybe." Texts in this religion are arranged into the "three grottoes" of authenticity, mystery, and spirit. This religion values a principle of passivity called "wu-wei" **(WOO-way)** and reads a book believed to be written by a nine hundred year old sage, Laozi **(LOUT-see)**, about "the way and its power." For 10 points, name this traditional religion of China.
ANSWER: **Dao**ism [or **Tao**ism]

2. People with this job included Ben Dreith and Ron Cherry, who both infamously used the phrase "giving him the business" on television. Besides being a lawyer, the overly muscular Ed Hochuli **(HOCK-a-lee)** has this job. In a commercial, a man with this job is told "your mic's on," reminding us to always double check. The 2012 "Fail Mary" incident in Seattle helped bring about an end to a lockout of people with this job, who routinely say things such as "automatic first down." For 10 points, name this occupation held by people who throw flags at NFL games.
ANSWER: football **referee** [or **ref**; or National Football League **referee**; or college football **referee**; or **football official**]

3. According to biographer Gail Levin, this painting may have been inspired by Ernest Hemingway's short story "The Killers." It supposedly depicts a real location on New York's Greenwich Street, and its artist's wife Jo was the model for one of its subjects, a woman in a red dress. This painting contains an advertisement for five-cent Phillies cigars above a glass-windowed restaurant with no visible entrance. For 10 points, name this painting of four people spending the wee hours in a diner, by Edward Hopper.
ANSWER: ***Nighthawks***

4. This politician ran commercials featuring a "bear in the woods" and the declaration that it was "Morning again in America." During this President's term, Oliver North used the proceeds of weapon sales to back anti-Sandinista rebels in Nicaragua. This former Governor of California was wounded by a disturbed shooter attempting to impress actress Jodie Foster. This President endorsed supply-side economics and demanded that Mikhail Gorbachev tear down the Berlin Wall. For 10 points, name this Republican President from 1981 to 1989.
ANSWER: Ronald **Reagan** [Ronald Wilson **Reagan**]

5. A film set in this country features a beach party where guests encounter a weird-looking stingray-like beast caught in a fisherman's net. Another film set in this country is about a man whose job putting up posters is threatened when his bicycle is stolen. A trilogy of films made by a director from this country features Clint Eastwood as the gunslinging "Man With No Name." The movie *La Dolce Vita* **(lah DOHL-chay VEE-tuh)** is set in this country. For 10 points, name this European country, the home of directors such as Federico Fellini, where the "spaghetti western" originated.
ANSWER: **Italy** [or the **Italian** Republic; or Repubblica **Italiana**]

6. For helping to orchestrate this war, Johann Patkul was broken on the wheel by the king whose land reduction policies sparked it. During this war, hetman Ivan Mazepa **(mot-SEP-uh)** switched sides to its loser. During this war, a king had a log cabin built to mark the future spot of a city called his "window to the west." This war was ended by the Treaty of Nystad, and it included the battles of Narva and Poltava. Saint Petersburg was founded during this war, in which Charles XII was defeated. For 10 points, name this war fought between Sweden and Peter the Great of Russia.
ANSWER: **Great Northern** War

7. The prefix "tecto-" is affixed to these minerals when they occur as a framework of tetrahedra. The viscosity of magma increases in direct proportion to the amount of these minerals in the magma. Based on the percent quantity of these minerals, igneous rocks can be classified as mafic and felsic. These minerals constitute approximately ninety percent of the rock-forming minerals in the Earth's crust. For 10 points, name these minerals that contain the elements silicon and oxygen.
ANSWER: **silicate**s [or **silica**; do not accept "silicon"]

8. This story's protagonist is thought to become a justice after moving away out of fear of "Hans Van Ripper." It takes place in the rural port of Greensburg, which is commonly known as "Tarry Town." In this short story, the suitor of Katrina Van Tassel is the local hero "Brom Bones." Its protagonist is never seen again after a ghostly figure apparently throws a severed head at him, although it may simply be a pumpkin. For 10 points, name this Washington Irving short story about Ichabod Crane's encounter with the Headless Horseman.
ANSWER: "The **Legend of Sleepy Hollow**"

9. This surface is the only one with non-zero curvature where all points are umbilics. This solid names a geometry where the interior angles of a triangle sum to more than 180 degrees. In its namesake coordinates, the volume of this solid can be computed as a double integral of r squared sine theta d theta d phi. The surface area to volume ratio of this object is three over its characteristic length, giving it the smallest surface area to volume ratio of the canonical 3D solids. For 10 points, name this solid whose volume is computed using the formula four-thirds pi times radius cubed.
ANSWER: **sphere** [or **2-sphere**]

10. This monarch was targeted in the failed Revolt of the Northern Earls. The so-called "spymaster," Francis Walsingham, helped this ruler uncover the Babington Plot. In the Tilbury speech, this ruler claimed to have "the heart and stomach of a king" despite having "the body of a weak, feeble woman." She ordered the execution of her rival, Mary, Queen of Scots, and was ruling England during the failed invasion of the Spanish Armada. For 10 points, name this final Tudor monarch, the daughter of Henry VIII known as the "Virgin Queen."
ANSWER: **Elizabeth I** [prompt on **Elizabeth**; or **Good Queen Bess**]

11. Eugene Fama developed a pricing theory known as the "efficient" hypothesis of this thing. A 1970 paper on the effect of information asymmetry on the quality of goods, by George Akerlof, is titled after one of these things "for lemons." Large inefficiencies in allocation under this thing are known as its "failure," and laissez-faire economics advocates its pure "free" kind. The prevailing trend in stock prices can be expressed as a "bear" or "bull" one of these things. For 10 points, give this word for the real or abstract place where commerce occurs.
ANSWER: **market**

12. In the hydrogen emission spectrum, the Paschen (POSH-un) series of spectral lines are emitted in this region of the EM spectrum. The spectroscopy that uses this kind of light, along with Raman spec, is one of the two main kinds of vibrational spectroscopy. Results using this range are in units of inverse centimeters, such as the 500 to 1450 inverse centimeter fingerprint region. Light with wavelength just above 700 nanometers is referred to as the "near" part of this region. For 10 points, name this type of light with wavelengths shorter than microwave, just beyond that of red colored light.
ANSWER: **infrared** light

13. A city with this status took on the new official name "Tshwane" (tish-WAH-nay) in 2012. The Constitutional Court sits in none of the three cities with this status, which is not mentioned in the 1996 constitution. The Supreme Court of Appeal sits in the city with this judicial status, while the National Assembly and National Council of Provinces are located in the city with this legislative status, and a third city with this status is the home of president Jacob Zuma. For 10 points, name this status which is de facto shared by Bloemfontein, Pretoria, and Cape Town.
ANSWER: **capital of South Africa** [prompt on **capital** city]

14. The integral of *a* to the *x* is equal to *a* to the *x* over this function of *a*. The integral of tangent of *x* can be stated as either negative this function of cosine of *x* or this function of secant of *x*. The derivative with respect to *x* of this function of *x* is one over *x*. This function of two is equal to approximately 0.693 and appears in definitions of the half-life because the half-life is a parameter for exponential decay. For 10 points, name this function that, for an input *z*, solves for *x* in *e* to the *x* equals *z*.
ANSWER: natural **log**arithm [or **ln**; or **log** e]

15. The title character of a novel by this author tries to establish a relationship with Victor Wind, the son of his ex-wife Liza, and is a heavily-accented professor at the fictional Waindell College. The kingdom of Zembla appears in a novel by this author titled for a 999-line poem written by John Shade. This author of *Pnin* **(puh-NEEN)** wrote a novel whose title character performs in a play written by Clare Quilty and is kidnapped by her nymphet-loving stepfather Humbert Humbert. For 10 points, name this Russian author of *Pale Fire* and *Lolita*.
ANSWER: Vladimir **Nabokov** **(nah-BO-koff)** [or Vladimir Vladimirovich **Nabokov**]

 **2016 VHSL Regionals - Round 04 - Directed Period**

1A. Name the painting medium which uses pigments that are soluble in an aqueous liquid.
ANSWER: **watercolor**

1B. What American company announced a December 2015 alliance with Ola, Dida Kuaidi, and GrabTaxi in an attempt to better compete with Uber in the rideshare market?
ANSWER: **Lyft**

2A. What singer's 2015 album *Revival* contains the songs "Good For You" and "Same Old Love?"
ANSWER: Selena **Gomez** [Selena Marie **Gomez**]

2B. What word means either a Classical-era summary of a longer piece of literature, or, in a modern sense, the best example of a concept?
ANSWER: **epitome** **(eh-PIT-oh-mee, but accept other pronunciations)**

3A. This is a 20-second calculation question. In parallelogram ABCD, the measure of angle A is one-third of the measure of angle B. What is the measure of largest angle in the parallelogram?
ANSWER: **135** degrees

3B. This is a 20-second calculation question. What is the domain of the function f of x equals pi over 4 plus arccosine of quantity x over 3 end quantity?
ANSWER: **-3 to 3**, inclusive [or **between -3 and 3**, inclusive]

4A. What glucose-derived polymer is found in the cell walls of fungi and in the hard exoskeleton of crustaceans **(cruh-STAY-shens)**?
ANSWER: **chitin** **(KY-tin)** [or **N-acetylglucosamine**]

4B. On a graph, the slopes of a function's tangent lines increase from left to right when the function is said to have what shape?
ANSWER: **concave up** [or **convex** down; prompt on **concave**; do not accept "concave down" or "convex up"]

5A. What baron oversaw the creation of wide boulevards during his renovation of Paris under the reign of Napoleon III?
ANSWER: Baron **Haussmann** [or Georges-Eugene **Haussmann**]

5B. What first wife of Prince Charles, known for her extensive charity work, died with Dodi Fayed in a 1997 car crash in Paris?
ANSWER: **Diana**, Princess of Wales [or Diana Frances **Spencer**]

6A. Ann Radcliffe's *The Mysteries of Udolpho* is an example of what genre of horror fiction, first pioneered by Horace Walpole in *The Castle of Otranto*?
ANSWER: **Gothic** novel

6B. What is the name for the phylum of sea creatures that includes urchins and starfish?
ANSWER: **echinoderm**ata

7A. In what Jewish ritual does a thirteen-year-old boy read a *haftarah* portion?
ANSWER: **bar mitzvah**

7B. Three percent of the population of Massachusetts are primary speakers of what language, the source of the words "saudade" **(SOW-dahd)** and "linguiça" **(lin-GWEE-suh)**?
ANSWER: **Portuguese** [or **português**]

8A. This is a 30-second calculation question. Akhil and Nate are playing a best 2-out-of-3 checkers series. If Akhil has a two-thirds probability of winning each game, and they never tie, what is the probability Akhil wins the series?
ANSWER: **20/27**

8B. This is a 30-second calculation question. If Cody can paint a wall in three hours, and Sarah can paint a wall in one hour, how many minutes would it take them to paint a wall working together?
ANSWER: **45** minutes

9A. Sint Maarten, Sint Eustatius, and the "ABC Islands" of Aruba, Bonaire, and Curaçao **(CUR-uh-sao)** are all Caribbean islands that are part of what larger country?
ANSWER: the **Netherlands** [Kingdom of the **Netherlands**; or Koninkrijk der **Nederlanden**; or **Holland**]

9B. What Cavalier poet included the poems "Corinna's Going a-Maying" and "To the Virgins, to Make Much of Time" in his collection *Hesperides* **(hes-PER-id-eez)**?
ANSWER: Robert **Herrick**

10A. A term for deliberately cruel practices comes from the name of what eighteenth-century French author of *Justine* and *The One Hundred Twenty Days of Sodom*?
ANSWER: Marquis de **Sade** **(SOD)** [Donatien Alphonse François, Marquis de **Sade**]

10B. What Secretary of State under Richard Nixon and Gerald Ford, a proponent of détente **(day-TONT)** policies, controversially won the Nobel Peace Prize in 1973?
ANSWER: Henry **Kissinger**

 **2016 VHSL Regionals - Round 04 - Third Period, Fifteen Tossups**

1. TPI isomerizes **(ai-SAHM-uh-rizes)** DHAP in this pathway. This pathway occurs at much higher rates in the Warburg effect. Its starting compound is converted to F6P after being phosphorylated **(foss-FOR-uh-lay-ted)** by hexokinase **(hex-oh-KAI-naze)**. G3PD catalyzes a reaction that produces two NADH for every six-carbon molecule entering this pathway. Under anaerobic **(AN-uh-ro-bik)** conditions, its products may be used in fermentation. For 10 points, name this pathway in which two pyruvate **(pie-ROO-vayte)** molecules are produced from glucose, before entering the Krebs cycle.
ANSWER: **glycolysis**

2. In 2012, this man's mother Violet was kidnapped near Aberdeen in a still-unsolved case. He played for the same team and position as Mark Belanger, whose defensive errorless streak he surpassed. This man, who briefly formed a middle infield combo with his brother Billy, homered off Chan Ho Park in his final All-Star Game appearance. In 1994, he surpassed Ernie Banks for most home runs by a shortstop, the year before breaking another record. For 10 points, name this Baltimore Orioles infielder who broke Lou Gehrig's consecutive games played streak in 1995.
ANSWER: Cal **Ripken**, Jr. [Calvin Edwin **Ripken**, Jr.]

3. In October 2014, this man announced a twenty-five million dollar donation to anti-Ebola initiatives. Along with Bill Gates and Warren Buffett, he signed the "Giving Pledge" in 2010. This man's "Start-up: Education" foundation. donated one hundred million dollars in 2010 to establish a charter school network in Newark, New Jersey. In 2015, he wrote a letter to his daughter Maxima, along with his wife Priscilla Chan, explaining his new plan to give away forty-five billion dollars to an array of long-term charitable initiatives. For 10 points, name this founder of Facebook.
ANSWER: Mark **Zuckerberg** [Mark Elliot **Zuckerberg**]

4. The probability that *X* minus mu is greater than or equal to *k* times this quantity is less than or equal to one over *k* squared., by Chebyshev's inequality. For a random variable *X*, this value is the root of: the expected value of the quantity *X* squared, minus the expected value of *X* squared. This quantity is multiplied by the root of two pi in the definition of the normal distribution, for which its first three integer multiples give rise to the 68, 95, 99.7 rule. For 10 points, identify this quantity that is represented by sigma and which is the square root of the variance.
ANSWER: **standard deviation** [or **std**; or **sd**; or **sigma** until it is read; do not accept "variance"]

5. This king dug a namesake canal through the isthmus of Athos. He was eventually assassinated by his bodyguard Artabanus. Atossa arranged the succession of this king, who was aided by the traitorous Ephialtes **(eff-ee-ALL-teez)**. This king's Immortals eventually overcame a regiment led by the Spartan Leonidas to win the Battle of Thermopylae, but he watched from a throne on a mountaintop as his forces lost the Battle of Salamis. For 10 points, name this ruler of the Achaemenid **(ack-EYE-men-id)** Empire, a son of Darius the Great who orchestrated an invasion of Greece in 480 BC.
ANSWER: **Xerxes I** [or **Xerxes** the **Great**; prompt on **Xerxes**]

6. This composer quoted Handel's "Hallelujah" chorus in an octet for strings that he wrote at the age of sixteen. Unusually for its time, the soloist enters almost immediately at the start of this composer's Violin Concerto in E minor. This composer's trip to Scotland was the inspiration for his third symphony and his overture *The Hebrides* **(HEH-bree-deez)**. A trumpet fanfare begins a piece by this composer written for a marriage scene in a William Shakespeare play. For 10 points, name this composer who included a wedding march in his incidental music to *A Midsummer Night's Dream*.
ANSWER: Felix **Mendelssohn** [Jakob Ludwig Felix **Mendelssohn**-Bartholdy]

7. After World War II, the Ustase **(OO-stash-ay)** leader Ante Pavelic **(PAH-veh-litch)** served as a security advisor for this politician. Supporters of this politician were massacred at Ezeiza **(eh-zay-EE-zah)** Airport. This man's government sheltered several Nazis, including Josef Mengele and Adolf Eichmann. This politician's working class supporters were nicknamed the descamisados **(DESS-cah-mee-SAH-dos)**, or the "shirtless ones." His third wife, Isabel, succeeded him as president. For 10 points, name this President of Argentina and husband of Eva Duarte.
ANSWER: Juan **Peron** [Juan Domingo **Peron**]

8. The protagonist of this poem takes refuge from a storm by hiding in a cave with his new lover. For wearing the belt of Pallas, Turnus is murdered at the end of this poem, whose opening words are "I sing of arms and the man." The Cumaean Sibyl instructs the protagonist of this poem to enter the underworld by showing Charon a golden bough. This poem's title hero flees Troy with his son Ascanias and his father Anchises **(ahn-KYE-zeez)**, and settles in Italy, where he becomes the ancestor of the Romans. For 10 points, name this epic poem by Virgil.
ANSWER: the ***Aeneid***

9. Tourists at this landmark can swim in an area with unusually calm current known as the "Devil's Pool." Its local name, Mosi-oa-Tunya **(MOH-see OH-ah TOON-ya)**, means "The Smoke That Thunders." A bridge crossing this landmark was designed to be part of Cecil Rhodes's unfinished Cape-to-Cairo Railway. A bronze statue of David Livingstone, this landmark's discoverer, lies upstream from it on the Zambezi River. For 10 points, name this waterfall shared by Zambia and Zimbabwe, which is named for a former British queen.
ANSWER: **Victoria Falls** [or **Mosi-oa-Tunya** until it is read; or The **Smoke That Thunders** until it is read]

10. This author debuted in the *Morning Chronicle* with a series of nine letters written under the pseudonym Jonathan Oldstyle. His later books include the collection *Tales of the Alhambra* and a history of New York written in the voice of his persona Diedrich Knickerbocker. This creator of Geoffrey Crayon wrote a story about a man who encounters Hendrick Hudson's men playing nine-pins and misses the American Revolution after falling asleep for years in the Catskills. For 10 points, name this early American author of "Rip Van Winkle."
ANSWER: Washington **Irving** [or Jonathan **Oldstyle** until it is read]

11. Bruno Cadoré is the current head of this order, which since 1903 has contributed all the sermonizers at Notre Dame in Paris. The original mission of this order was to convert the Cathars of southern France to mainstream Catholicism. This order was founded in 1216 by the Spanish-born patron saint of astronomers, and grew to be nicknamed "hounds of the Lord" or "Black Friars." Albertus Magnus and Thomas Aquinas belonged to this order. For 10 points, identify this Catholic religious order which lends its name to a "republic" in the Caribbean.
ANSWER: **Dominican**s [or **Order of Preachers**; or **Dominican** Order; prompt on **OP**]

12. These events create surface waves known as Love and Rayleigh waves. In areas of subduction, these events occur frequently in Benioff **(BEN-ee-off)** zones. In the elastic-rebound theory of these events, they are modeled as the result of a buildup of stress and strain and a sudden discontinuous jump. A modern measurement scale for these events is the moment magnitude scale, which replaced the Richter scale. For 10 points, name these events that occur in the Earth's crust, releasing seismic energy and causing the Earth to shake.
ANSWER: earth**quake**s [or **tremor**; or **tremblor**]

13. The title character of this story had "gone beyond the bounds" of even his host's "indefinite decorum." It ends with a narrator noting that "darkness, decay," and the title character "held illimitable dominion over all." The main setting of this story is an abbey with seven rooms, all decorated and illuminated in specific colors. This story ends with a mysterious stranger showing up at a masquerade ball and killing Prince Prospero and all his court. For 10 points, name this Edgar Allan Poe short story about a lethal plague.
ANSWER: "The **Masque of the Red Death"** [or "The **Mask of the Red Death**: A Fantasy"]

14. This country outlawed the Communist Huks movement under the presidency of Manuel Roxas **(ROH-hahs)**. Cardinal Jaime Sin was a leader of a popular revolution in this country. A dictatorship in this country was overthrown in the People Power Revolution, which resulted in a first lady who owned over a thousand pairs of shoes fleeing. This country was ruled by Ferdinand Marcos, and its occupation by the USA was opposed by guerrilla leader Emilio Aguinaldo. For 10 points, name this island country in the Pacific which is led by Benigno Aquino III.
ANSWER: **Philippines** [Republic of the **Philippines**; or Republika ng **Pilipinas**]

15. A character in this novel tells a story about a tortoise who convinces several birds to give him their entire feast. At its end, a man plans to write *The Pacification of the Primitive Tribes of the Lower Niger*. This novel's protagonist defeats "the Cat" in wrestling, but he is later exiled after his gun explodes at the funeral of Ezeudu **(eh-zay-OO-doo)**. In this novel, the people of Umuofia **(oo-moo-OH-fee-uh)** struggle against the influence of British colonists. For 10 points, name this novel about Okonkwo **(oh-CONK-woh)** by the Nigerian novelist Chinua Achebe **(CHIN-wah uh-CHAY-bay)**.
ANSWER: ***Things Fall Apart***

 **2016 VHSL Regionals - Round 04 - Tiebreaker Questions**

1. This man added in "attributes" to several paintings he made while staying in Cadaqués **(cah-dah-KAYZ)**, such as his *Portrait of Daniel-Henry Kahnweiler*. This man's *Boy Leading a Horse*, along with numerous paintings of clowns, come from his Rose Period. A bright light bulb appears above a braying horse in a grey piece by this man that protested the bombing of a Basque village during the Spanish Civil War. For 10 points, name this Spanish Cubist artist of *Guernica*.
ANSWER: Pablo **Picasso** [Pablo Ruiz y **Picasso**]

2. In a story in this collection, a fisherman discovers a locked chest containing the dismembered body of a woman who was murdered by her husband for her unfaithfulness. A character in this collection visits a valley filled with diamonds that men harvest using birds called rocs. In this collection, Morgiana attempts to cover up the death of Cassim, who was murdered after stealing treasure from a cave which granted access with the words "open sesame." For 10 points, name this collection of stories featuring Sinbad and Ali Baba, told by Scheherazade **(shuh-HAIR-uh-zod)**.
ANSWER: ***One Thousand and One Nights*** [or *The* ***Arabian Nights****' Entertainment*; or *A* ***Thousand and One Nights***; or *The* ***Thousand and One Nights***]

3. The glycosidic linkages between glucose molecules in cellulose are between carbon one and the carbon with this number. This is the number of water molecules produced per molecule of propane in a combustion reaction. Molecules with a seesaw geometry have this many bonds, as do square planar molecules. Hydrocarbons with the "but-" prefix, such as butane, contain this many carbons. For 10 points, name this number which is both the atomic number for beryllium and the number of hydrogens in methane.
ANSWER: **four**

4. In 1998, this city amalgamated with five surrounding municipalities including Etobicoke **(eh-TOE-bik-oh)** and Scarborough. This city is home to the Yonge-University subway line and in 1971 canceled its planned Spadina Expressway. It is the largest city in the Golden Horseshoe, which also contains Mississauga and Hamilton. Its tallest structure contains the seven-story Main Pod and is a communications tower built by a railway company. For 10 points, the CN Tower is in what city on the north shore of Lake Ontario, the most populous in Canada?
ANSWER: **Toronto**

5. This ruler dispatched Lucius Verginius Rufus to put down the Vindex revolt. He ordered the execution of such people as the poet Lucan after the Pisonian conspiracy. This emperor was advised by his tutor, Seneca the Younger. According to Suetonius, he sang "The Sack of Ilium" while a 64 AD disaster ravaged his capital. This man's death kicked off the Year of the Four Emperors. For 10 points, name this last emperor in the Julio-Claudian dynasty, the successor to Claudius, who legendarily fiddled while Rome burned.
ANSWER: **Nero**

What form of heat transfer occurs at low Biot **(bee-YOH)** numbers, follows Fourier's law, and occurs due to the collision of microscopic particles?
ANSWER: thermal **conduction**

This is a calculation question. To the nearest integer, convert 3 pi over 11 radians to degrees.
ANSWER: **49** degrees