**2016 VHSL Regionals - Round 05 - First Period, Fifteen Tossups**

1. This location of the Gemini North instrument also hosts the submillimeter array, which was constructed after successful interferometry observations with the James Clerk Maxwell instrument. The two second-largest optical instruments in the world, part of the Keck Observatory, are located at this site. This site's height of nearly fourteen thousand feet puts it above much of the water vapor in the atmosphere, making it great for ground-based astronomy. For 10 points, name this dormant volcano in Hawaii.
ANSWER: **Mauna Kea**

2. This author wrote about the Irish widow Kate Leslie being drawn into an Aztec cult while on a visit to Mexico in his novel *The Plumed Serpent*. In a novel by this author, the protagonist courts both Miriam and Clara Dawes before killing his mother Gertrude with a dose of morphine. This man faced an obscenity trial over the content of a novel in which the gamekeeper Oliver Mellors has an illicit affair with Constance, whose husband Clifford was paralyzed in World War I. For 10 points, name this novelist who created Paul Morel in *Sons and Lovers* and wrote *Lady Chatterley's Lover*.
ANSWER: D.H. **Lawrence** [David Herbert Richards **Lawrence**]

3. In one of this man's paintings, two children play underneath a bench while a maid is washing laundry at the back of a private alleyway. This painter of *The Little Street* painted the Schiedam and Rotterdam Gates from across a harbor in another depiction of his hometown. This artist also painted a portrait in which the title woman, who is turning her head to face the viewer, is wearing a yellow and ultramarine blue turban as well as the title piece of jewelry. For 10 points, name this Dutch painter of *View of Delft* and *Girl With A Pearl Earring*.
ANSWER: Johannes **Vermeer**

4. A throne found at Takalik Abaj was carved out of a larger artifact that was once shaped like one of these things. Monuments shaped like these things are found in Tres Zapotes, San Lorenzo, and La Venta, and were built with stone quarried from the Sierra de los Tuxtlas mountains. These things, which are sometimes used to suggest a connection between indigenous Americans and Africa, were created by a culture that flourished in what is now Veracruz and Tabasco prior to 400 BC. For 10 points, name these human body parts sculpted in colossal form by the Olmecs.
ANSWER: Olmec giant stone **head**s

5. BCL-2 family members control the mitochondrial pathway activating this process, which involves cytochrome c **(SAI-toe-chrome c)** release triggering a caspase cascade. It can be distinguished from similar pathways by DNA laddering. *C. elegans* embryos undergo this process 131 times during development. In human embryos, it is responsible for eliminating the webbing between toes. It can occur in response to irreparable cellular damage or as part of a regular schedule, unlike autophagy **(aw-TOFF-uh-jee)** and necrosis. For 10 points, name this process of programmed cell death.
ANSWER: **apoptosis**

6. A comic book series named after this profession debuted with stories about Ching Lung and Slam Bradley. Bobo the Chimpanzee also works in this profession. This is the paying profession of a character who allies with Trish Walker and Luke Cage to defeat Killgrave in a 2015 Netflix series adapting the comic book *Alias*. In 1939, the twenty-seventh issue of a comic titled for this profession introduced its "world's greatest" exemplar. For 10 points, name this profession found in the title of the longest-running American comic book, which featured Batman and gave its name to DC Comics.
ANSWER: **detective** [or private **investigator**; or **P.I.**; or synonyms such as **gumshoe**]

7. An incident in this industry was the target of the Cullen Inquiry. That incident, which killed 167 people, was named after the *Piper Alpha* and occurred near Aberdeen, considered the European center of this industry. A variant of this substance discovered in Britain, Brent, is used as an international pricing benchmark. Britain first become a net importer of this commodity in 1984. For 10 points, name this resource, found in the North Sea in the 1960s, that was exploited by companies such as Amoco and BP.
ANSWER: **oil** [or **petroleum**]

8. This person had the Breadbasket Law passed after dissolving a diplomatic relationship with the words "We will not walk to Canossa." This person's policies were bolstered by the May Laws devised by Adalbert Falk. This politician engineered a war by editing the Ems Dispatch, and he attacked the Catholic church with his Kulturkampf. This promoter of realpolitik called for the unification of his country in the "Blood and Iron" speech. For 10 points, name this "Iron Chancellor" of Wilhelm I, a nineteenth-century German statesman.
ANSWER: Otto von **Bismarck** [or Otto Eduard Leopold, Prince of **Bismarck**]

9. This playwright wrote about the architect Martin, who falls in love with the title animal, in his play *The Goat, or Who Is Sylvia?* A man recalls how he obtained hamburger meat to poison a dog, to another man on a park bench, in his one-act play about Peter and Jerry. A story about an imaginary son who died in a car crash after swerving to avoid a porcupine punctuates his play about the couple George and Martha. For 10 points, name this American playwright of *The Zoo Story* and *Who's Afraid of Virginia Woolf?*
ANSWER: Edward **Albee**

10. Richard von Krafft-Ebing referred to this phenomenon as "inversion," and Laud Humphreys studied this phenomenon in the 1970 book *Tearoom Trade*. A 1957 paper by Evelyn Hooker addressed the classification of this behavior, leading to its 1973 removal from the DSM. The exclusive practice of this behavior characterizes people who rate as a 6 on the Kinsey scale. California and New Jersey ban attempts to "convert" people who engage in this behavior. For 10 points, name this phenomenon characteristic of two to ten percent of the U.S. population.
ANSWER: **homosexuality** [or word forms or equivalents]

11. A primordial god of this country sneezes the siblings Shu and Tefnut into existence. In ancient times, this country believed in nightly battles between a sun god and the snake Apep. For a time, this country venerated a single god named Aten. Dead souls of its countrymen were weighted against Ma'at's **(mah-AHT's)** feather to determine if they led righteous lives. Priests of this country used the scarab beetle to symbolize the cyclic journey of the sun god Ra across the sky. For 10 points, name this country which mummified the dead to help them in the afterlife.
ANSWER: **Egypt**

12. Data can be "smoothed" by applying the moving form of this quantity. In calculus, this quantity can be found for the value of a function in a closed interval by dividing the definite integral of that function by the length of the interval. One type of this quantity considers the most common outcome of an event, though a more commonly used type of this quantity is determined by dividing the sum of the numbers in a set by the number of numbers in that set. For 10 points, name this quantity that, in statistics, is often synonymous with the mean.
ANSWER: **average** [or **mean** until it is read]

13. A play by this author includes a scene in which six washerwomen gossip about the title character, who longs for a child and eventually kills her infertile husband Juan. This author included the section "The Spilled Blood" in a lengthy poem honoring the deceased Ignacio Sanchez Mejias **(ig-NAH-see-oh SAHN-chez MAY-hee-ahs)**, his "Lament for the Death of a Bullfighter." In a play by this man, Leonardo Felix runs away with the Bride at the end of the title event, only to be killed by the Groom. For 10 points, name this Spanish poet and playwright who wrote *Yerma* and *Blood Wedding*.
ANSWER: Federico Garcia **Lorca**

14. This organ is the primary source of angiotensinogen **(AN-jeo-ten-SIN-uh-jen)**. This organ makes an attachment to the body wall called the falciform **(FAL-sih-form)** ligament. A vein, an artery, and a duct are found in this organ's portal triad. The cystic duct joins with the common duct of this organ, which collects a fluid produced in its right and left functional lobes, to make a common bile duct leading to the gallbladder. Long-term alcohol abuse can cause cirrhosis **(sih-RO-suss)** of this organ. For 10 points, name this organ affected by hepatitis.
ANSWER: **liver**

15. In this city, Clint Hill was filmed jumping onto a moving limousine. A man went to a movie theater in this city shortly after killing J.D. Tippit. It was where Governor John Connally was wounded while passing through Dealey Plaza, an incident partially caught on the Zapruder film. In this city's police headquarters, nightclub owner Jack Ruby shot a man on live television. The Warren Commission concluded that a killing in this city was carried out by Lee Harvey Oswald. For 10 points, name this Texas city where, in 1963, President John F. Kennedy was assassinated.
ANSWER: **Dallas**

 **2016 VHSL Regionals - Round 05 - Directed Period**

1A. Which empire used the devsirme **(dev-SHEER-may)** system to take young boys from Christian regions and train them to become Janissaries?
ANSWER: **Ottoman** Empire

1B. What dramatic term refers to a speech given by a solitary character?
ANSWER: **soliloquy**

2A. In what city did August Wilson set most of his ten-play cycle about black American life, including *Fences* and *The Piano Lesson*?
ANSWER: **Pittsburgh**

2B. What laboratory technique purifies compounds based on their boiling point by heating a solution and condensing its vapors?
ANSWER: **distillation**

3A. This is a 20-second calculation question. Divide the polynomial 16 x to the seventh plus 4 x to the sixth minus 24 x to the fourth by the monomial 8 x squared.
ANSWER: **2 x to the fifth plus one-half x to the fourth minus 3 x to the third** [or **2 x to the fifth plus one-half x to the fourth minus 3 x cubed**]

3B. This is a 20-second calculation question. What is the range of the function y equals 2 times sine x times cosine x?
ANSWER: **-1 to 1**, inclusive [or **between -1 and 1**, inclusive]

4A. Which wonder of the ancient world was allegedly built by Nebuchadnezzar **(NEH-boo-kod-NEH-zer)** to please his homesick wife, Amytis?
ANSWER: **Hanging Gardens** of Babylon

4B. What present-day European country was home to the painter Ilya Repin, who depicted men hauling a barge on the Volga River?
ANSWER: **Russia** [or **Russian Federation**; or **Rossiyskaya Federatsiya**; or **Rossiya**]

5A. Whitehorse is the capital of what Canadian territory, established in 1898 in the wake of a gold rush in its Klondike region?
ANSWER: **Yukon** Territory

5B. What American novelist wrote a series of novels about the washed-up basketball star Harry "Rabbit" Angstrom?
ANSWER: John **Updike**

6A. Michael Curry is the Presiding Bishop of what Christian denomination, formed when institutional Anglicanism in the U.S. broke away from the Church of England?
ANSWER: The **Episcopal** Church [or Protestant **Episcopal** Church in the United States of America; or **Episcopalian**ism; or P**ECUSA**]

6B. John McCarthy coined the term for what field of study that tries to emulate a human's learning and decision-making capabilities with software?
ANSWER: **AI** [or **artificial intelligence**]

7A. What prominent English novelist of *The End of the Affair* wrote about an unnamed "whiskey priest" in Mexico in *The Power and the Glory*?
ANSWER: Graham **Greene** [Henry Graham **Greene**]

7B. What quantity is represented by the area under an acceleration-time graph, and also by the derivative of displacement with respect to time?
ANSWER: **velocity** [or **v**]

8A. This is a 30-second calculation question. If a box contains 10 total red and blue balls, and the probability of drawing one of each when picking two is eight-fifteenths, what is the difference between the number of red and blue balls in the box?
ANSWER: **2** balls

8B. This is a 30-second calculation question. Circle O has radius 6 units. The length of major arc AC is twice the length of minor arc AC. What is the length of chord AC?
ANSWER: **6** times the square **root** of **3** units [or **6** times **rad**ical **3** units]

9A. What Chinese anti-foreigner rebellion was put down by the Eight Nation Alliance and was led by the Society of Righteous and Harmonious Fists?
ANSWER: **Boxer** Rebellion [or word forms for rebellion, such as **Boxer** Uprising; or **Yuhetuan** movement]

9B. North Face founder Douglas Tompkins died in a 2015 kayak accident in what country, where Michelle Bachelet **(bah-che-LAY)** is serving her second stint as president?
ANSWER: **Chile** [Republic of **Chile**; or Republica de **Chile**]

10A. If a person is described as "Nemetskiy" **(NEE-mee-ET-skee)** in Russian or "alemán" **(ah-lay-MAHN)** in Spanish, then what is he in English?
ANSWER: **German**

10B. What band announced their new song "L.A. Devotee" on Thanksgiving 2015, and previously recorded the albums *Pretty. Odd.* and *Too Weird to Live, Too Rare to Die*?
ANSWER: **Panic! at the Disco**

 **2016 VHSL Regionals - Round 05 - Third Period, Fifteen Tossups**

1. In this state, Amelia Boynton was viciously attacked and James Reeb was murdered. A governor in this state performed the "stand in the schoolhouse door." On the 1965 "Bloody Sunday" in this state, peaceful activists were attacked by police on the Edmund Pettus Bridge. "Segregation forever" was called for by this state's governor George Wallace. Martin Luther King Jr. wrote an open letter from a jail in this state, the site of a 1950s bus boycott. For 10 points, in what Southern state did civil rights protesters engage in marches from Selma to Montgomery?
ANSWER: **Alabama**

2. Abby Johnson left this group in 2009 and now runs the organization And Then There Were None. This group was contacted by actors playing representatives of the Biomax Procurement Services. In 2015, the Center for Medical Progress released videos purporting to show actors trying to buy tissues and organs from this group. One of its clinics was attacked by a gunman who said "no more baby parts" after being arrested. For 10 points, name this non-profit American organization that provides reproductive health services.
ANSWER: **Planned Parenthood** [**Planned Parenthood** Federation of America; or **PPFA**]

3. An integer's factorization is said to be "free" of these numbers when its Mobius function is zero. The sum of two consecutive triangular numbers is one of these numbers. If one knows this value for an integer n, subtracting two n minus one gives this value for n minus one. This term describes trinomials with a double root and with first and third terms having this property. The factors a plus b and a minus b occur in an identity involving a difference of two of 0these numbers. For 10 points, integers described by what term are obtained by raising an integer n to the power of two?
ANSWER: perfect **square** [or **square** number]

4. Parodies of this painting include Gordon Parks's image of an African-American woman holding a mop and broom, as well as its recreation in *The Music Man*. It was inspired by the window in the Dibble House in Eldon, Iowa. Two pots of flowers appear over the shoulder of a woman modeled after the artist's sister, Nan, in this painting. For 10 points, what Grant Wood painting features an austere woman and a pitchfork-holding man standing outside of their white house?
ANSWER: ***American Gothic***

5. A character in this book names his son Gershom because he is an "alien in a foreign land." A man almost dies in this book before his wife Zipporah circumcises her son. Early in this book, a man is told "I AM that I AM" by a voice from a burning bush. This book outlines the building of the sinful "Golden Calf," the receipt of the Ten Commandments, and the various plagues wrought upon Pharaoh's country. For 10 points, name this second book of the Old Testament, which describes Moses leading the Israelites out of Egypt.
ANSWER: Book of **Exodus** [or Book of **Names**; or **Sh'mot**]

6. The only Pokémon that is purely this type is Tornadus. In Generation III, the gym leader at Fortree City favors this type of Pokémon and in Generation V it is favored by the gym leader at Mistralton City. A move which is HM02 **(h-m-2)** in all generations is this type. Three legendary Pokémon in Generation I were this type. This type of Pokémon is super effective on Grass-type while Electric-type is super effective against it. For 10 points, name this type of Pokémon, examples of which include Yveltal **(IV-ell-tal)**, Charizard, and Swellow.
ANSWER: **flying**-type

7. The protagonist of this novel witnesses a strange woman checking off radio programs while sitting in Celeste's restaurant. Its protagonist attempts to comfort the old man Salamano **(sal-uh-MAHN-oh)** over the loss of his scab-ridden dog and begins a sexual relationship with Marie the day after his mother's funeral. The protagonist of this novel blames the heat of the sun for his murder of an Arab on a beach in Oran, a crime for which he is eventually executed. For 10 points, name this existentialist novel about Meursault **(mer-SOH)**, written by Albert Camus **(al-BAIR ca-MOO)**.
ANSWER: *The* ***Stranger*** [or *The* ***Outsider***; or ***L'Etranger***]

8. Edward Winslow wrote a text about this colony called *Mourt's Relation*. A journal about life here was written by Governor William Bradford, and one of its military leaders was named Myles Standish. So-called "Strangers" and religious separatist "Saints" signed a governing document for this colony in Provincetown Harbor. Members of this colony were aided by the native Squanto in celebrating the "first Thanksgiving." For 10 points, name this colony founded by Pilgrims who came to America on the *Mayflower*.
ANSWER: **Plymouth** colony [or **Plymouth** Plantation; or New **Plymouth**; or **Plymouth** Bay]

9. Two sons of this god race each other around the world, but the winner chooses to simply run circles around this god instead. A river goddess falls out of heaven and lands in this god's hair. Kartikeya **(kar-tih-KAY-uh)** is one of this god's sons; another of his sons is decapitated after refusing this god entry into his own home. This god then subsequently provides the head of an elephant as a replacement for that son, Ganesha. For 10 points, name this husband of Parvati, the Hindu god of destruction, who is contrasted with his Trimurti counterparts Brahma and Vishnu.
ANSWER: **Shiva**

10. A list of several holders of this title was made from Kim Ryholt's translation of the Turin Canon. A scribe named Imhotep built the first tomb for a leader with this title. The holder of this office wore a crown of red and white, which represented Narmor uniting the Upper and Lower portions of the country that they ruled. Howard Carter discovered the tomb of a boy holder of this title, named Tutankhamun. For 10 points, name these ancient kings of Egypt who were buried in pyramids.
ANSWER: **Pharaoh**s [prompt on **King**s of **Egypt** until it is read]

11. The protagonist of this novel becomes friends with a prison chaplain, who believes him reformed due to his interest in the Old Testament, and frequently refers to himself as "your humble narrator." Several characters in this novel speak a Russian-based argot called Nadsat. Its protagonist is forced to watch violent films while being injected with drugs when he is treated with the Ludovico Technique. In this novel, the Beethoven-loving Alex DeLarge leads his "droogs" on a spree of violence around a dystopian version of England. For 10 points, name this novel by Anthony Burgess.
ANSWER: *A* ***Clockwork Orange***

12. This element is the anode to copper in the Daniell cell, and a popular battery named for carbon and this metal uses graphite surrounded by a casing of it. Carbonic anhydrase, an enzyme important for maintaining blood pH, contains an ion of this metal. It is the last transition metal of the first period in the d-block. Galvanization is a process that coats this metal onto steel to prevent rusting. Because of rising copper prices, the American penny is now almost entirely this metal. For 10 points, name this element with symbol Zn.
ANSWER: **zinc** [or **Zn** until it is read]

13. The composer of this piece refused to acknowledge the audience at one of its earliest performances because he believed conductor Arturo Toscanini performed it too quickly. This piece was commissioned as the music for Ida Rubenstein's ballet *Fandango*. A solo flute plays the first statement of this piece's melody, which is passed around the orchestra in a long crescendo over a constant snare drum pattern. For 10 points, what piece named after a Spanish dance was written by Maurice Ravel?
ANSWER: ***Bolero***

14. William Wollaston and William Nicol name devices that induce this phenomenon. An ordinary and an extraordinary ray are created in a quarter-wave plate to convert between two forms of this phenomenon. Anisotropy in dichroic **(dye-KRO-ik)** materials imparts this property through selective absorption. Light that is composed of two plane waves that are ninety degrees apart in phase has the circular type of this property. In this phenomenon, components of a wave oscillate in the same direction. For 10 points, name this phenomenon that sunglasses use to reduce glare.
ANSWER: **polarization** [or word forms such as **polarized**]

15. This concept was introduced by Quirico Filiopanti and Charles Dowd, but was not adopted until the publication of the *Traveler's Official Railway Guide* by William F. Allen. This system came into use on November 18, 1883, the "Day of Two Noons." China officially abandoned its use in 1949, after previously using five of its divisions. The standard for this system is now UTC, replacing an offset defined in reference to the Greenwich **(GREN-itch)** Observatory. For 10 points, name this system which exists in the U.S. in Pacific, Mountain, Central, and Eastern areas.
ANSWER: **time zone**s

 **2016 VHSL Regionals - Round 05 - Tiebreaker Questions**

1. An eel named Felipe appears in a novel by this author whose first title character is an astronomer jealous of Nevil Maskelyne. In another novel by this author, the psychiatrist Doctor Hilarius reveals his history in Nazi concentration camps to the executor of Pierce Inverarity's will. This author of *Mason & Dixon* also created an American lieutenant in World War II whose sexual experiences are correlated with the explosions of V-2 rockets. For 10 points, name this postmodern novelist of *The Crying of Lot 49* and *Gravity's Rainbow.*
ANSWER: Thomas **Pynchon**

2. IP3 stimulates release of this element into the cytoplasm, where it interacts with PKC. This element moves through L- and T-type voltage-gated channels during the cardiac action potential. This element is sequestered by SERCA pumps into the sarcoplasmic **(sar-co-PLAZ-mik)** reticulum. Parathyroid hormone stimulates intestinal uptake of this element by activating vitamin D. This element, with a plus-two charge, is the most prevalent mineral in the body and can be obtained by drinking milk. For 10 points, name this alkaline **(AL-kuh-line)** earth metal with atomic number 20, symbolized Ca.
ANSWER: **calcium**

3. This city is home to the Gazelle Valley nature reserve, and the Cave of Nicanor is found on its Mount Scopus. This city's historic core is surrounded by walls built by Suleiman the Magnificent, and contains the Armenian Quarter. A site here is home to a cave known as the "well of souls" underneath the Foundation Stone, and is avoided by one religion to prevent entering the Holy of Holies. Its east and west portions are divided by the Green Line. For 10 points, name this city, home to the Dome of the Rock and the Temple Mount, claimed as the capital of both Palestine and Israel.
ANSWER: **Jerusalem**

4. The Arthur Freed unit at MGM specialized in films in this genre, such as *Meet Me in St. Louis*. It's not comedy, but a later film in this genre is about the making of a movie complicated by its leading lady's awful voice. That film in this genre features Cosmo's demonstration of how to "Make 'Em Laugh." Fred Astaire and Ginger Rogers were famous for appearing in this film genre. A movie in this genre contains a sequence where Gene Kelly holds an umbrella in a downpour. For 10 points, name this film genre which includes *Singin' in the Rain*.
ANSWER: **musical** [or **dancing** films; prompt on **comedy** until mentioned]

5. The "Great Smog" in this city in 1952 killed thousands and led to the Clean Air Act 1956. About thirteen people died in a terrorist attack that took place in this city's Tavistock Square. Its eccentric mayor introduced a system of New Routemaster buses along with a public bicycle system and is named Boris Johnson. The day after securing a bid for the Summer Olympics, this city was the victim of the 7/7 suicide bombing attacks. For 10 points, name this British city whose Underground train system was bombed in 2005.
ANSWER: **London**

What American novelist analogized the railroad network to the title creature in *The Octopus*?
ANSWER: Frank **Norris**

This is a calculation question. What is the domain of the function given by f of x equals the natural log of the quantity negative x squared plus 7x minus 12?
ANSWER: **(3,4)** [or **3 to 4**, exclusive; or x is **between 3 and 4**]