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

1. This poem describes wise men who "know dark is right" and speak with words that "forked no lightning." This poem describes "grave men" who "see with blinding sight" before noting "Blind eyes could blaze like meteors and be gay." This poem opens by noting "Old age should burn and rave at close of day." It was written for its author's dying father David and includes the repeated refrain "Rage, rage against the dying of the light." For 10 points, name this villanelle by Dylan Thomas.
ANSWER: "**Do Not Go Gentle Into that Good Night**"

2. A resident of this state, Payton Head, apologized for posting unfounded reports of a KKK sighting on Facebook. In this state, Melissa Click called for "some muscle" to remove someone filming the end of a hunger strike. This state was where the group "Concerned Student 1950" was formed to protest displays of racism. For 10 points, name this state whose 2015 protests ousted Tim Wolfe from the presidency of its flagship university in Columbia.
ANSWER: **Missouri**

3. Several hours before the start of this holiday, some people practice the "kapparot" ritual, involving swinging a bag of money or a live chicken around one's head. This holiday, which takes place on the tenth day of Tishrei **(TISH-ray)**, involves special prohibitions on washing and wearing leather, and is concluded when the ne'ila **(neh-EE-lah)** service is ended by sounding the shofar. For 10 points, name this "day of atonement," the most important holiday in Judaism.
ANSWER: **Yom Kippur**

4. Helmholtz coils generate uniform versions of this quantity, which can be measured with Hall probes. A toroidal and a poloidal version of these entities confine a plasma in a tokamak. Dynamic microphones make use of a coiled wire in one of these entities to generate a current. The force on a moving charge is perpendicular to both its velocity and this quantity. It is measured in Gauss **(gowss)** or Teslas. For 10 points, name this vector field that runs from a north pole to a south pole.
ANSWER: **magnetic field** [or **B** field; or **H** field]

5. A practitioner of this technique used it for *Women at the Well*, set in the fishing village of Saint-Tropez, as well as a portrait in which swirling patterns are seen behind the art critic Félix Fénéon. It was developed in tandem with divisionism and was practiced by Paul Signac. A painting in this style features a man with a fishing rod accompanied by a woman with a monkey on a leash. For 10 points, *Sunday Afternoon* by George Seurat uses what technique, which employs tiny dots of color?
ANSWER: **pointillism**

6. A tunable example of these substances that operates at low temperatures is strontium titanate. These things work by their constituent dipoles polarizing to generate an E-field that opposes the external field. These things are characterized by a namesake constant kappa, which is equal to their permeability divided by the permeability of free space. For 10 points, name these insulators that are sandwiched between the plates of a capacitor to increase its capacitance.
ANSWER: **dielectric** [prompt on **insulator**]

7. Electronic pH meters use this equation to calculate the concentration of ions in solution. A quantity in this equation, symbolized capital Q, is defined as the ratio of concentrations of reactants, and is equal to K sub E Q at equilibrium. This equation is most commonly expressed as E equals E nought, plus R T, over number of electrons transferred, times the natural log of the reaction quotient. For 10 points, identify this fundamental equation of electrochemistry named for a German chemist.
ANSWER: **Nernst** equation

8. The "father" of this system was William Still. "Stockholders" were financial supporters of this system, whose agents called the Ohio River the "River Jordan." People who were part of this system called the Big Dipper the "drinkin' gourd", and it resulted in thousands of people ending up in the so-called "Canada West." A person who made at least thirteen trips as part of this system was Harriet Tubman. For 10 points, name this system in which "conductors" helped slaves escape to the North.
ANSWER: **Underground Railroad**

9. A governor of this state, Evan Mecham **(MEE-kahm)**, canceled a paid MLK Day holiday for state employees. A politician from this state was targeted by a television advertisement depicting a young girl counting daisies, until a nuclear bomb detonates. A case involving this state's police ruled that defendants must be informed of their right to remain silent before questioning. For 10 points, name this southwest state, the home state of Barry Goldwater, which was sued by Ernesto Miranda in 1966.
ANSWER: **Arizona**

10. This city contains a sixty-foot waterfall inside its Brackenridge Park. The working buffalo and cattle ranch at Enchanted Springs is within the limits of this city, which is home to the Southwest School of Art and the Tower of the Americas. The Long Barrack Museum preserves relics from a site in this city, where a massacre occurred about six months after the Battle of Goliad. For 10 points, name this site of Davy Crockett's death at the Alamo, as well as the AT&T Center where the Spurs play.
ANSWER: **San Antonio**

11. Failed shows aired on this network include *Supertrain*, *Stressed Eric*, and *Father of the Pride*. This network aired comedies such as *Will & Grace* and *Frasier* as part of its long-running Thursday night programming block branded as "Must See TV." This network runs yearly broadcasts of live musicals, including *The Wiz Live!* In fall 2015, this network premiered the shows *The Player*, *Blindspot*, and *Heroes Reborn*. For 10 points, the *Today* and *Tonight* shows air on what network with a peacock logo?
ANSWER: **NBC** [or **National Broadcasting Company**; or **NBC**Universal]

12. A play by this author ends with a ship's laborer, Yank, killed by a gorilla at the zoo. In another play by this author, Brutus is killed by a silver bullet after going from being a Pullman porter to the would-be monarch of a Caribbean island. This man wrote an autobiographical play about the Tyrone family, including their tubercular son Edmund and morphine addicted mother Mary. For 10 points, name this author of plays such as *The Emperor Jones* and *Long Day's Journey Into Night*.
ANSWER: Eugene **O'Neill**

13. When the longest of these things is connected to two other examples of these things, a right triangle is formed, according to Thales's theorem. For an ellipse, parallel examples of these things have collinear midpoints. If two of them intersect in a circle, the product of the two segments for one equals the product of the two segments for the other. If they passes through the center of a circle, they're a diameter. For 10 points, name these line segments whose endpoints lie on a circle, as opposed to secants.
ANSWER: **chord**s

14. This two-word term was coined in 1959 to refer to the Center for Behavioral Sciences at Stanford, and it was popular in the 1960s as a shorthand for the RAND Corporation. The 1971 Powell Memo urged American conservatives to create these institutions, which now include the Brookings Institution and Heritage Foundation. For 10 points, give this term for nonprofits which generally hire intellectuals to provide research and commentary in support of specific political positions.
ANSWER: **think tank**s

15. At Galesburg, this politician said the U.S. government was "made by white men for the benefit of white men." This man lost much Southern support when he endorsed the Freeport Doctrine as a way of responding to the *Dred Scott* decision. Known as the "Little Giant," he designed a law extending popular sovereignty into the territories called the Kansas-Nebraska Act. This man lost the presidential election of 1860. For 10 points, name this Illinois Senator who debated Abraham Lincoln in 1858.
ANSWER: Stephen **Douglas** [Stephen Arnold **Douglas**]

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

1A. In computer science, an algorithm might traverse what type of data structure, whose leaf nodes have no children?
ANSWER: **tree** data structure

1B. In Greek mythology, what bard loses his wife Eurydice **(you-rid-uh-see)** forever when he turns around to face her before fully exiting the underworld?
ANSWER: **Orpheus**

2A. Tom Ridge was the first Secretary of what Cabinet department established in response to the September 11 attacks?
ANSWER: Department of **Homeland Security**

2B. What Portuguese prince and son of John I earned his nickname for sponsoring the caravel **(care-uh-vell)** voyages of his country's explorers to Africa?
ANSWER: **Henry** the **Navigator** [or **Henry** of **Aviz**; or **Henrique** instead of "Henry"; prompt on **Henry** or **Henrique**]

3A. This is a 20-second calculation question. Given that line segment FG measures 5 units, line segment GH measures 12 units, and triangle FGH is acute, then between what two values must the length of line segment FH lie?
ANSWER: between **7 and 13** [or **at least 7 but less than 13**]

3B. This is a 20-second calculation question. What is the center of the circle formed by graphing x-squared plus y-squared equals 6x minus 10y + 155?
ANSWER: **(3, -5)**

4A. What word refers to an extended metaphor structuring a poem or other piece of writing?
ANSWER: **conceit**

4B. The fundamental theorem of what branch of mathematics relates the derivative and the antiderivative?
ANSWER: **calculus**

5A. What body swapping 1976 movie, starring Jodie Foster as Annabel Andrews, was remade in 2003 with Lindsay Lohan and Jamie Lee Curtis?
ANSWER: ***Freaky Friday***

5B. What is the English word for the substance called "xiě" **(SHEE-eh)** in Mandarin, "krov" in Russian, and "sangre" **(SAHN-gray)** in Spanish?
ANSWER: **blood**

6A. The constable Dogberry appears in what Shakespeare play, which ends with the marriage of Hero and Claudio and features the confused lovers Beatrice and Benedick?
ANSWER: ***Much Ado About Nothing***

6B. The Madrid metro area and most of Portugal receive their drinking water from what river that flows through Lisbon?
ANSWER: **Tagus** River [or Rio **Tajo**; or Rio **Tejo**]

7A. George Gershwin used the lullaby "Summertime" to open what opera about a disabled African-American beggar's love for the girlfriend of the abusive dockworker Crown?
ANSWER: ***Porgy and Bess***

7B. Name the founder of Turing Pharmaceuticals who sparked Internet outrage in September 2015 when he announced a five thousand percent rise in the price of the medication Daraprim.
ANSWER: Martin **Shkreli**

8A. This is a 30-second calculation question. When you roll three six-sided dice, what is the probability the product of the numbers showing is prime?
ANSWER: **1/24**

8B. This is a 30-second calculation question. If cosine of 2 theta equals 17/32, find all possible values of cosine of theta.
ANSWER: **7/8** and **-7/8** [or **0.875** and **-0.875**; do not accept answers with more or fewer than two values]

9A. The epic poem *Sir Thaddeus* describes a feud in what modern day country, which at the time of its writing by Adam Mickiewicz **(mit-SKYEH-vitch)** was unified with Lithuania?
ANSWER: **Poland** [or **Polska**]

9B. What is the type of photoreceptor in the eye that is used to detect colors, in contrast to rod cells?
ANSWER: **cone**s

10A. The cry "Remember the Alamo!" was taken up at what victory for Sam Houston over Santa Anna, the decisive battle of the Texas Revolution?
ANSWER: Battle of **San Jacinto**

10B. The stories "The Lawyer of Glass" and "The Colloquy of the Dogs" appear in the *Exemplary Novels* of what Spanish author, who is better known for creating Don Quixote?
ANSWER: Miguel de **Cervantes**

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

1. This composer wrote a clarinet concerto for the virtuoso Anton Stadler **(shtaat-ler)**. The *Andante* from his *Elvira Madigan Concerto* is a popular concert piece. His 25th symphony is called the "little G minor" symphony, in contrast with his 40th, the "great G minor." This composer wrote twelve variations on the melody of "Twinkle, Twinkle, Little Star." His final symphony was named for the chief Roman god. For 10 points, name this composer of the *Jupiter* Symphony and *Eine kleine Nachtmusik*.
ANSWER: Wolfgang Amadeus **Mozart**

2. A poem by this author describes a plant which "bore an apple bright" that kills the speaker's foe. Another poem by this author depicts a creature that has "softest clothing wooly bright." This author of "A Poison Tree" asked "What immortal hand or eye dare frame thy fearful symmetry?" in a poem about a creature "burning bright in the forests of the night." For 10 points, name this British poet who included "The Lamb" and "The Tyger" in his collection *Songs of Innocence and Experience*.
ANSWER: William **Blake**

3. In a play set in this city, a man gives a speech about "rebell[ing] against the belly" to stop a riot over lack of grain. A commander who rebels against this city is stopped from sacking it by his mother, Volumnia. Two conspirators in this city claim that they're "underlings" and that "the fault...is not in our stars." An oration imploring its people to "lend me your ears" honors a ruler who was stabbed to death by Brutus and Cassius. For 10 points, name this setting of Shakespeare's *Coriolanus* and *Julius Caesar*.
ANSWER: **Rome**

4. This molecule is at the center of tri-nitro-toluene. Isomers of this molecule include prismane and fulvene. Complete hydrogenation of this molecule produces cyclohexane. The carbon-carbon bonds within this molecule are all 1.4 angstroms, between single and double bond lengths of 1.5 and 1.3. Its double bond electrons are delocalized around a six membered ring, which is often drawn as a hexagon with a circle inside. For 10 points, name this simplest aromatic compound with formula C6H6.
ANSWER: **benzene** [or **C6H6** before mention]

5. A queen from this region gave birth to Edward the Confessor. After a siege of Chartres **(shar-truh)**, Charles the Simple allowed a Viking leader to settle in this region. Poppa of Bayeux **(bayou)** married the first ruler of this region, Rollo. A duke from this region allied with Eustace of Boulogne **(boo-lohn)** and Alan Rufus to defeat Harold Godwinson at the Battle of Hastings in 1066. For 10 points, name this region of France, from which William the Conquerer led a conquest of England.
ANSWER: **Normandy**

6. At a battle, this monarch was opposed by the Raevsky redoubts and Pyotr Bagration. This leader launched an invasion after a treaty signed on a raft in the Neman River, the Treaty of Tilsit, was violated. This monarch won a tactical victory against Mikhail Kutuzov at the Battle of Borodino, only for retreating forces to burn their own capital. This leader lost 400,000 men when he invaded Russia in an attempt to punish Alexander I. For 10 points, name this French emperor who lost at Waterloo.
ANSWER: **Napoleon** Bonaparte [or Napoleon **Bonaparte**; or **Napoleon** I]

7. This song's music video shows the singer using an outdated cell phone and features Tristan Wilds. This song laments that "you never seem to be home" and says "it clearly doesn't tear you apart anymore." Greg Kurstin co-wrote this song along with its performer, who released it as the lead single off the album *25*. After its title, this song continues with the lyric "it's me, I was wondering" and says "I must have called a thousand times." For 10 points, name this 2015 song by Adele **(uh-DEL)**.
ANSWER: "**Hello**"

8. This building's roof is clad in glazed ceramic tiles with a subtle chevron pattern, and was constructed by taking sections from a sphere. Peter Hall completed design work for this building, and its original architect was not mentioned at its 1973 opening. This building, situated on Bennelong Point, contains the Joan Sutherland Theatre. Its roof consists of overlapping sail-like concrete "shells." For 10 points, Jorn Utzon **(yearn ootz-en)** designed what performing arts venue in Australia's largest city?
ANSWER: **Sydney Opera House**

9. This religion believes that every period of paired ascending and descending time cycles brings forth twenty-four ford-builders. In 2015, a court outlawed the practice of *sallekhana*, which about four hundred members of this religion undergo every year, and involves intentionally starving oneself to death. This religion was founded by Mahavira and is divided into white-clad and sky-clad sects. For 10 points, name this Indian religion which seeks *moksha* and practices *ahimsa*, or total nonviolence.
ANSWER: **Jain**ism

10. This character's mother, Caroline Beaufort, dies of scarlet fever when he is a teenager. After the death of his younger brother, this man's housekeeper is erroneously executed. This character's best friend, Henry Clerval, is murdered by a gigantic figure, whom he pursues to the North Pole, where he's found by Captain Robert Walton. On his wedding night, his creation kills his fiancée, Elizabeth. For 10 points, name this title character in a Mary Shelley novel, a scientist who creates an artificial man.
ANSWER: Victor **Frankenstein** [or **Victor** Frankenstein]

11. Naked mole-rats are thought to be the only mammals unable to adjust this quantity. Cytokines **(SY-toe-kynes)** act as pyrogens **(PY-roe-jenz)** to homeostatically elevate this quantity in response to pathogens. This quantity is slightly raised in many females at the time of ovulation. It is not actively regulated in ectotherms, or cold-blooded animals. For 10 points, name this quantity that in humans is kept at around 98.6 degrees Fahrenheit.
ANSWER: body **temperature** [prompt on **body heat**]

12. An algorithm developed by this mathematician involves replacing the larger of two numbers with its difference with the smaller number until zero is reached to find the greatest common divisor. Spherical and hyperbolic geometries results when messing with the definition of this man's fifth postulate. This mathematician was the first to rigorously define geometry, doing so in thirteen books. For 10 points, name this ancient Greek mathematician from Alexandria and author of the *Elements*.
ANSWER: **Euclid** **(you-klihd)**

13. This region was home to the Greek colony of Chersonesus. Mongol forces catapulted corpses over the walls of this region's city of Caffa, starting the Black Death. The term "thin red line" was first used to describe soldiers fighting in this region, where Lord Lucan ordered the Charge of the Light Brigade. The fall of its main city, Sevastopol, ended a 1850s war that made a hero out of Florence Nightingale. For 10 points, name this peninsular region currently disputed between Russia and Ukraine.
ANSWER: **Crimea** [prompt on **Ukraine** until it is read]

14. A department of this country is named after Rutherford B. Hayes. This country's southern border is formed by the Pilcomayo River and it's home to the Guaraní people. In 2009, this country suffered a 15-minute blackout after power from the Itaipu **(ee-type-oo)** Dam was disrupted. Josef Mengele lived in this country when it was ruled by Alfredo Stroessner. It is completely surrounded by Argentina, Brazil, and Bolivia. For 10 points, name this South American country whose capital is Asunción.
ANSWER: **Paraguay** [Republic of **Paraguay**; or República del **Paraguay**]

15. A book titled *The Death of* this hero is a compilation of myths about him written by Thomas Malory. In myths, this hero feuds with his half-sister, the sorceress Morgan le Fay, though he is ultimately killed by his illegitimate son Mordred. This hero's land is ravaged by the secret affair between his wife Guinevere **(gwin-uh-veer)** and his most loyal knight, Sir Lancelot. For 10 points, name this mythical king of England who wields the sword Excalibur.
ANSWER: King **Arthur** [or **Arthur** Pendragon]

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

1. Boats on this river are celebrated in the Tall Stacks festival. The Silver Bridge collapse tragedy occurred on this river at Point Pleasant. The city of Paducah was founded at the northernmost point on this river that is ice-free year-round. This river ends at Cairo, Illinois, where it joins the Mississippi, just under a thousand miles after it is formed by the Allegheny and Monongahela at Pittsburgh. For 10 points, name this river that flowers through Louisville, Kentucky and Cincinnati in its namesake state.
ANSWER: **Ohio** River

2. Acoetes **(AY-see-teez)** is the only survivor when this god transforms a crew of pirates into dolphins. After banning his worship, the Theban king Pentheus is ripped to shreds by this god's frenzied female followers, the Maenads. He rewards the rescue of Silenus by offering King Midas anything he wants. Before his birth, this god is sewn into the thigh of Zeus, who kills this god's mother Semele **(SEH-muh-lee)** by presenting himself in his full glory. For 10 points, name this Greek god of wine.
ANSWER: **Dionysus**

3. Follicular dendritic cells and these cells express the surface proteins CD19 and CD21. Burkitt's lymphoma is a cancer of these cells. During affinity maturation, these cells may change their receptor proteins through class switching. Some of them differentiate into plasma cells. Somatic hyper-mutation allows these lymphocytes to diversify the repertoire of immunoglobulins they produce. For 10 points, name these white blood cells that secrete antibodies, unlike T cells.
ANSWER: **B** cells [or memory **B** cells; accept **plasma** cells until it is read]

4. A man of this profession named Guy de Chauliac advised Clement VI to burn a fire in his room. An important text for members of this profession was authored by Andreas Vesalius. People of this profession sometimes wore bird-like, beaked masks. Barbers often worked in this profession during the Middle Ages. Medieval people of this profession often tried to create a balance of the four humours. For 10 points, name this profession whose practitioners once used leeches to bleed their patients.
ANSWER: **doctor**s [or **physician**s; or **surgeon**s; or **anatomist**s; or other obvious equivalents]

5. In a short story by this author, Tom is beaten with a walking stick by his father Farrington. This author of "Counterparts" wrote a story whose protagonist realizes he is a "creature driven and derided by vanity" while visiting a bazaar to buy a gift for Mangan's sister. In a story by this author, hearing "The Lass of Aughrim" at a party reminds Gretta of her old love Michael Furey, disturbing her husband Gabriel Conroy. For 10 points, name this author who included "Araby" and "The Dead" in his collection *Dubliners*.
ANSWER: James **Joyce**

The abundance of what 2 amu **(a m u)** isotope was a key piece of evidence in favor of the Big Bang theory over steady state theory?
ANSWER: **deuterium** [or **D**; or **2 H**; or **heavy hydrogen**; or **hydrogen 2**; prompt on **H 2**]

This is a calculation question. If a sphere and a cone have the same volume, and each has a radius of 2 inches, what is the height of the cone?
ANSWER: **8** inches