**2016 VHSL Conferences - Round 02 - First Period, Fifteen Tossups**

1. This author wrote a novel about Bunny Ross, the son an oil millionaire. This man created a character who is married to Ona, who is raped by her boss. He wrote eleven novels about an arms manufacturer's son named Lanny Budd. In this man's best known novel, the protagonist is a Lithuanian who loses his family and embraces socialism. That novel by this man features Jurgis Rudkus, who works in the horrific meatpacking plants of Chicago. For 10 points, name this muckraking author of *The Jungle*.
ANSWER: Upton **Sinclair** [Upton Beall **Sinclair**, Jr.]

2. CML is characterized by an abnormality in one of these structures discovered at UPenn. Abnormalities in them can result from deletions in their long and short arms. These structures can be visually represented with a karyotype. They are duplicated to make sister chromatids **(KRO-muh-tids)**, and their homologous types can undergo recombination during meiosis **(my-OH-sis)**. For 10 points, name these structures that carry genetic material and include X and Y types.
ANSWER: **chromosome**s [or homologous **chromosome**s; or polytene **chromosome**s; or sister **chromatid**s before it is read]

3. A leader of this country smashed three bottles of blood after delivering a speech in Meskel Square and fought Siad (**SEE-ahd)** Barre (**Bar-ray**) in the Ogaden War. The Soviet Union aided this country while it was led by Mengitsu (**MENG-eet-zoo**) Mariam's Derg military junta. Its emperor Menelik II defeated Italy at the battle of Adowa. Members of the Rastafari religion believe that this country's former emperor, Haile (**HIGH-lee**) Selassie, is the returned Messiah. For 10 points, name this African country that became landlocked after Eritrea gained independence from it.
ANSWER: **Ethiopia** [Federal Democratic Republic of **Ethiopia**; or **Ityopiya**; or **YeEtiyopiya**; or **YeEtyopiya**]

4. In November 2015, Christine Lagarde proposed adding this currency to the IMF's list of global reserve currencies. It was devalued in August 2015 to keep exports strong, contradicting suggestions to allow its exchange rate to float freely. Both Donald Trump and Mitt Romney have accused this currency of being artificially manipulated. Its value is controlled by a People's Bank which holds more assets than any central bank besides the Federal Reserve. For 10 points, name this currency of China.
ANSWER: **yuan** [or **renmibi**]

5. This hero is advised to send a dove through the Clashing Rocks to test if it is safe for him to pass as well. Like Cadmus, this hero throws a rock into the midst of five warriors that sprout from dragon's teeth. After arriving in Iolcus **(eye-OHL-cuss)**, the usurper Pelias sends this hero away to Colchis (**cole-kiss)**, where he falls in love with the sorceress Medea while captaining a group of shipmates who are in search of the Golden Fleece. For 10 points, name this leader of the Argonauts.
ANSWER: **Jason**

6. A poem by this author describes a soldier who is dragged into a tent after being shot and ends with the speaker claiming "You're a better man than I am" about the title water carrier. This author of the collection *Barrack-Room Ballads* included advice for his son John in a poem that concludes "you'll be a Man, my son." For 10 points, name this British poet of "Gunga Din" and "If-," who also wrote *The Jungle Book*.
ANSWER: Rudyard **Kipling** [Joseph Rudyard **Kipling**]

7. Proofreading in this process can be performed by 3-prime to 5-prime exonuclease **(ex-oh-NOOK-lee-aze)** activity. This process in yeast is initiated at ORCs. A ligase **(LYE-gaze)** in this process joins together Okazaki fragments formed off the lagging strand, which acts as a template for a helicase moving away from a namesake fork. It occurs during the S phase of the cell cycle. For 10 points, name this process in which a double-stranded molecule is copied.
ANSWER: DNA **replication**

8. The dwarf Fafnir transforms into one of these creatures, but is killed by Sigurd. A smaller type of this creature which only has two legs is the wyvern **(WHY-vern)**. According to tradition, an entire town converted to Christianity after St. George killed one of these creatures. For defeating a white one, a red creature of this type is depicted on the flag of Wales. For 10 points, name these legendary monsters which often fly around and breathe fire.
ANSWER: **dragon** [or **wyvern** before "wyvern" is read]

9. Shiga **(SHE-guh)** toxin was transduced from *Shigella* to this organism. Semiconservative DNA replication was demonstrated in this organism by Meselson and Stahl. It can be infected by the T4 bacteriophage **(bak-TEER-eo-fayj)**. Pathogenic strains of this bacterium include O157:H7, which can cause bloody diarrhea. For 10 points, name this Gram-negative gut bacterium that can cause food poisoning and is often used as a model organism.
ANSWER: ***E. coli*** [or ***Escherichia coli***]

10. By converting nitrogen to oxygen using alpha radiation, this physicist discovered and named the proton. This physicist discovered the principle of radioactive half-life. While directing the Geiger-Marsden experiment, he developed a sequel to J. J. Thomson's plum pudding model of the atom. The Geiger-Marsden experiment overseen by this man fired alpha particles at a metal sheet and confirmed the existence of the nucleus. For 10 points, name this physicist who oversaw the gold foil experiment.
ANSWER: Ernest **Rutherford**

11. A secessionist attempt in this country's southeast, the Republic of Biafra, was proclaimed in the 1960s by its Igbo people. Its capital, built near Aso Rock, replaced a port city in its Yoruba-majority southwest in 1991. In 2014, 276 schoolgirls were kidnapped in this country's northeastern town of Chibok (**CHEE-bock**) by the Jihadist group Boko Haram **(HAH-rahm**). Lagos is this country's largest city and its capital is Abuja. For 10 points, what nation is the most populous in Africa?
ANSWER: **Nigeria** [Federal Republic of **Nigeria**]

12. In a television commercial, this player reads excerpts from negative scouting reports. In his sophomore year, he led his Southern Conference team to the Elite Eight and set a single-season NCAA record with 162 three pointers. This all time leading scorer in Davidson College history is the son of NBA player Dell and is part of the "Splash Brothers" tandem with teammate Klay Thompson. For 10 points, name this 2015 NBA MVP, the point guard for the Golden State Warriors.
ANSWER: Stephen **Curry** [Wardell Stephen **Curry** II; or Steph **Curry**]

13. A king with this name founded a "Print Yard" publishing house supervised by the Patriarch Nikon. Another ruler with this name was known as "Moneybags" for his support of the Golden Horde. A monarch with this name ordered the Oprichnina **(oh-pree-chee-na)** to commit the Novgorod **(nahv-gah-rahd**) massacre and commissioned Saint Basil's Cathedral. That king with this name killed his own son. For 10 points, give this name held by a Russian tsar **(zar)** known as the "terrible."
ANSWER: **Ivan** [or **Ivan I**; or **Ivan IV**; or **Ivan** the Terrible]

14. Conspiracy theories connected the death of a man with this name to that of banker Roberto Calvi. A leader with this name was the target of an assassination attempt by Grey Wolves member Mehmet Agca (**awg-ca**). That pope with this name opposed the Latin American liberation theology movement and supported the anti-Communist trade union Solidarity in his home country, Poland. For 10 points, give this name of two popes, the second of whom was succeeded by Benedict XVI in 2005.
ANSWER: **John Paul** [or **John Paul** I; or **John Paul** II; or **Ioannes Paulus**; prompt on Karol Jozef **Wojtyla** or Albino **Luciani**]

15. This man's additions to the Royal Collection are discussed in Jerry Brotton's book *The Sale of the Late King's Goods*. He commissioned allegories of divine right for the ceiling of the Banqueting House at Whitehall from Paul Rubens, and he was painted in a "triple portrait" and other depictions by his court painter, Anthony van Dyck **(Dike**). For 10 points, name this art patron whose time as King of England ended with his 1649 execution.
ANSWER: **Charles I** [prompt on **Charles**]

 **2016 VHSL Conferences - Round 02 - Directed Period**

1A. The Lavaux (**LUH-vow**) vineyards are found along what Alpine lake, a widening of the Rhône River between Switzerland and France?
ANSWER: Lake **Geneva** [or lac **Léman**; or lac de **Genève**; or **Genfersee**]

1B. The letters "nd," "ns," or "nt" **(read the individual letters)** near the end of a Latin verb usually indicate that the verb is serving what grammatical function?
ANSWER: **participle**

2A. What adjective describes rhymes in which two lines end with multiple rhyming syllables, the last of which are unstressed?
ANSWER: **feminine** rhyme

2B. What scientist names a constant equal to one over four pi times the permittivity of free space, and also an equation that gives the force between two stationary point charges?
ANSWER: Charles-Augustin de **Coulomb**

3A. This is a 20-second calculation question. If I pick two cards at random from a standard 52-card deck, without replacement, what is the probability they are of different colors?
ANSWER: **26/51**

3B. This is a 20-second calculation question. If the base ten logarithm of 5 is approximately 0.7, what is the base ten logarithm of 1250, to the nearest tenth?
ANSWER: **3.1**

4A. In the Ulster Cycle, what Irish hero named for a dog defends his kingdom against the forces of Queen Medb **(rhymes with "cave")** at the Cattle Raid of Cooley?
ANSWER: **Cú Chulainn** **(koo HULL-in)** [or **Sétanta** **(SHAY-dahn-dah)**]

4B. What organization, long led by Baldur von Shirach (**SHEE-rock**), was the compulsory children's section of the Nazi Party and drafted many German teenagers, such as the future Pope Benedict XVI?
ANSWER: **Hitler Youth** [or **Hitlerjugend**]

5A. Philip Glass and Steve Reich are part of what musical movement focused on the repetition of very short rhythms and chord progressions?
ANSWER: **minimalism** [or word forms]

5B. What type of linear function does not use an equals sign, but rather symbols such as less than or greater than?
ANSWER: linear **inequality**

6A. The sonnet "The World Is Too Much With Us" was written by what English poet, who collaborated with Samuel Taylor Coleridge on the collection *Lyrical Ballads*?
ANSWER: William **Wordsworth**

6B. What song, whose chorus features the lyrics "Jealousy turning saints into the sea, swimming through sick lullabies," was the breakout hit for The Killers?
ANSWER: "**Mr. Brightside**"

7A. What Jewish-American novelist wrote *American Pastoral* and *Portnoy's Complaint*?
ANSWER: Philip **Roth**

7B. What domestic terrorist set off a truck bomb in front of Oklahoma City's Alfred P. Murrah Federal Building in 1995, killing 168 people?
ANSWER: Timothy **McVeigh**

8A. This is a 30-second calculation question. A triangle's sides measure 10 inches, 12 inches, and 17 inches. What is the cosine of the angle opposite the 17-inch side?
ANSWER: **-3/16** [or **-0.1875**]

8B. This is a 30-second calculation question. Frank wants to build a rectangular goat pen next to an already existing barn, so he only needs enough fencing for three sides. If he has 60 feet of fencing, what is the largest rectangular pen he can build?
ANSWER: **450** square feet

9A. Iowa, Nebraska, and Illinois are the top three state producers of what biologically based fuel additive, which the EPA declined to mandate higher levels of in a 2015 review?
ANSWER: **ethanol**

9B. Edna Pontellier (**PAHN-tee-lee-ay**) is the protagonist of what novel by Kate Chopin **(SHOW-pan**)?
ANSWER: *The* ***Awakening***

10A. What treatment for renal failure involves ultrafiltration and waste removal from the blood across a semipermeable membrane to replace kidney function?
ANSWER: **dialysis** [or peritoneal **dialysis**; or hemo**dialysis**]

10B. What Western city was home to Emperor Norton and suffered a 1906 earthquake that killed over three thousand people?
ANSWER: **San Francisco**, California

 **2016 VHSL Conferences - Round 02 - Third Period, Fifteen Tossups**

1. This planet provided the first detailed observations of an extraterrestrial collision when Shoemaker Levy 9 broke apart and collided with it. The first detailed observations of this planet were performed by the *Pioneer 10* probe. The *New Horizons* probe used a gravity assist from this planet to reach Pluto. Its Galilean moons include a moon so large it has a magnetosphere: Ganymede (**gan-ee-meed**). For 10 points, name this gas giant that's the largest planet in the Solar System.
ANSWER: **Jupiter**

2.. This leader authorized a test of a nuclear device at Pokhran (**POKE-ran**) that was codenamed "Smiling Buddha." This opponent of the Janata alliance ruled during The Emergency from 1975 to 1977. This leader's bodyguards assassinated her in response for ordering an attack on the Sikh (**Seek**) Golden Temple at Amritsar (**Ahm-reet-sar**). For 10 points, name this daughter of Nehru (**Ney-roo**) and first female Prime Minister of India.
ANSWER: **I**ndira **Gandhi** [**I**ndira Priyadarshini **Gandhi**; prompt on **Gandhi**]

3. At this event, a man receives a dipped morsel of bread that signifies his duplicity. Early in this event, a leader shows his humility by washing his followers' feet before telling them to love one another. During it, the leader says "take, eat, this is my body" after breaking bread. This event was where the Eucharist (**yoo-ca-rist**) tradition began and where Judas Iscariot's betrayal was predicted. For 10 points, name this final meal shared by Jesus with his disciples.
ANSWER: **Last Supper**

4. The leader of this event replaced Antonin Novotny before it and was replaced by Gustav Husak (**HOO-sahk**) after it. This event's leader initiated a domestic reform program known as "socialism with a human face." This period ended with a Soviet invasion twelve years after the USSR invaded Hungary. Alexander Dubcek (**DOOB-check**) was replaced as president after this event. For 10 points, name this brief period of reform in Czechoslovakia in 1968.
ANSWER: **Prague Spring**

5. When this value approaches 1, the Prandl (**PRAN-dell**)-Glauert (**GLAW-ert**) transformation produces a singularity. When this value is less than point three, the flow is considered incompressible, and it reaches one within the choked flow of a de Laval nozzle. The inverse sine of this value is equal to the half-angle between the direction of flight and the angle of the shockwave. For 10 points, name this number equal to the ratio of the speed of an object to the speed of sound in the medium.
ANSWER: **Mach** number

6. A play by this author opens with a prologue spoken by the ghost Machiavel **(mah-kee-uh-vel**). The protagonist of that play by this man hires Ithamore to bring down a governor who had seized his wealth, but dies when he falls into a boiling cauldron. In another of his plays, Wagner serves the title character, who employs Mephistophilis (**MEFF-uh-stoff-uh-leez**) after making a pact sealed in blood. For 10 points, name this Elizabethan dramatist who wrote *The Jew of Malta* and *Doctor Faustus*.
ANSWER: Christopher **Marlowe**

7. A character in this novel is attacked by Joseph's dogs when he attempts to borrow a lantern for a journey home. The frame story of this novel involve Mr. Lockwood's visit from Thrushcross Grange to the title location, where he is told a story by Nelly Dean. In this novel, Mr. Earnshaw takes in the young Heathcliff off the street, and Heathcliff falls in love with Earnshaw's daughter Catherine, who is married to Edgar Linton. For 10 points, name this only novel by Emily Bronte.
ANSWER: ***Wuthering Heights***

8. On *The Larry King Show*, this man vigorously debated Ross Perot about NAFTA. With Joel Hyatt, he founded the TV channel Current TV that was later sold to Al Jazeera. This man, who ran for president with Connecticut Senator Joe Lieberman, won a Nobel Peace Prize for his book about climate change called *An Inconvenient Truth*. For 10 points, name this vice president under Bill Clinton who lost the 2000 presidential election to George W. Bush.
ANSWER: Albert "Al" **Gore** Jr.

9. This actress played a character who initially recruits Jess Bhamra to the Hounslow Harriers in *Bend It Like Beckham*. This actress portrayed a mathematician who works on the Enigma project and becomes engaged to Alan Turing in *The Imitation Game*. In another role, she rejects Commodore Norrington in favor of waiting every ten years for Will Turner. For 10 points, name this actress who played Elizabeth Swann in the *Pirates of the Caribbean* series.
ANSWER: Keira **Knightley** [Keira Christina **Knightley**]

10. This composer's last symphony ends with a despairing Adagio lamentoso, and was premiered just nine days before his death. This composer pitted the anthems "La Marseillaise (**mahr-see-aize**)" and "God Save the Tsar (**zar**)" against each other in a piece that climaxes with a series of cannon shots to commemorate his nation's victory in the Battle of Borodino. For 10 points, name this Russian composer of the *Pathétique* (**paht-TA-teek**) Symphony and the *1812 Overture*.
ANSWER: Pyotr Ilyich **Tchaikovsky**

11. A character in this play places a blue envelope full of money on a mahogany table in Madame Pace's **(PAH-chays)** bridal shop, where the Mother works feverishly as a seamstress. In this play, the Director has his staging of *Mixing It Up* interrupted by several people, including the Father and Stepdaughter. For 10 points, name this absurdist play by Luigi Pirandello **(peer-un-DELL-oh)** about several figures looking for a writer.
ANSWER: ***Six Characters in Search of an Author*** [or ***Sei personaggi in cerca d'autore***]

12. Due to this phenomenon, a solid-liquid boundary on a famous phase diagram has a negative slope. The adenine (**add-a-nine**)-thymine and cytosine-guanine **(gwah-neen**) base pairs in DNA are connected via it, and it is also responsible for the decrease in density of water when it freezes into ice. For 10 points, identify this attractive intermolecular force that occurs between either nitrogen, oxygen or fluorine and the lightest element of the periodic table.
ANSWER: **hydrogen bond**ing

13. This site is located across from the "moonlight garden" on the banks of the Yamuna River, and its grounds include a red sandstone building known as the "jawab" and a north-south reflecting pool. This white marble building, near the city of Agra, is flanked by four minarets. Its two false sarcophagi (**sar-koff-a-kee**)lie above the tombs of Mumtaz and her husband. For 10 points, name this Indian mausoleum which Mughal **(MOO-gahl**) emperor Shah Jahan built for his favorite wife.
ANSWER: **Taj Mahal**

14. Franz Boas **(BOH-ahz)** argued against the validity of this concept in a book grouping it with language and culture. Johann **(YO-hahn)** Blumenbach coined now-outdated terms for groupings under this concept, such as "Mongoloid" and "Caucasoid." Systems of hierarchy based on this concept include apartheid **(uh-PART-ide)** and Jim Crow. For 10 points, name this socially constructed human grouping, partially based on physical features such as skin color.
ANSWER: **race** [or word forms such as **racism** or **racial**]

15. This artist included a Poe novel and the rear of a man's head, also shown from the rear in a mirror, in *Not To Be Reproduced*. A painting on an easel hides an identical landscape in his two versions of *The Human Condition*. In another of his paintings, two empty candlesticks and a clock are on the mantle of a fireplace from which a train is emerging. For 10 points, what Belgian surrealist of *Time Transfixed* painted a pipe above the words "This is not a pipe" in *The Treachery of Images*?
ANSWER: René **Magritte** [or René Francois Ghislain **Magritte**]

 **2016 VHSL Conferences - Round 02 - Tiebreaker Questions**

1. Pepsin and trypsin **(TRIP-sin)** are types of these compounds active in metabolizing proteins from food. Restriction digests use these proteins to selectively cut apart DNA. Many of them contain the suffix "-ase" **(aze)**, such as polymerase **(puh-LIM-uh-raze)** and catalase **(CAT-uh-laze)**. These proteins reduce the activation energy of a reaction. For 10 points, name these proteins that act as biological catalysts.
ANSWER: **enzyme**s

2. This country is divided into eighteen "gobolka," and its Ogo Mountains run parallel to its northern coast on the Gulf of Aden. This country contains Gaarodi (**GUH-rod-dee**), Darwishland, and dozens of other areas which are de facto independent, ever since its 1991 civil war led to a period of functional anarchy. For 10 points, name this country on the Horn of Africa where U.S. forces once intervened at Mogadishu **(Moh-gah-deesh-oo**).
ANSWER: **Somalia** [Federal Republic of **Somalia**; or Jamhuuriyadda Federaalkaa **Soomaaliya**]

3. Key gods in this religion, such as Babalú-Ayé (**bob-a-loo-AY-yay**) and Shangó, are identified with Catholic saints such as Lazarus and Barbara, respectively. This religion believes in the worship of Olodumare **(Oh-low-doo-mar-ay**) through intermediaries known as orishas. For 10 points, name this religion of the Spanish Caribbean, which combines Yoruba and Catholic beliefs and is known for its practice of sacrificing small animals.
ANSWER: **Santeria**

4. In debates for this election, the Republican nominee repeatedly brought up a citizen known as "Joe the Plumber." In September of this election year, the Republican candidate suspended his campaign to address the financial bailout package deliberations. This election featured the first time the Republican Party's ticket featured a woman, in this case, Sarah Palin. For 10 points, name this presidential election in which John McCain lost to Barack Obama.
ANSWER: Election of **2008**

5. The protagonist of this novella formerly worked for the joyous Mr. Fezziwig. This novella, which is divided into five "staves," opens with the enchained ghost of Jacob Marley appearing to the employer of Bob Cratchit, the miserly Ebenezer Scrooge, who is visited by three spirits representing past, present, and future. For 10 points, name this Charles Dickens novella set during a certain winter holiday.
ANSWER: *A* ***Christmas Carol***

What Austrian painter frequently used gold-leaf in his artworks, such as *The Kiss* and the *Beethoven Frieze* (**Freeze**)?
ANSWER: Gustav **Klimt**

This is a calculation question. If I pick three distinct letters from the 26-letter alphabet at random, what is the probability that none of them is one of the six vowels A, E, I, O, U, or Y?
ANSWER: **57/130**