**2016 VHSL Regionals - Round 01 - First Period, Fifteen Tossups**

1. A protein believed to help stabilize microtubules **(my-cro-TUBE-yules)** becomes hyperphosphorylated **(hyper-foss-FOR-uh-lated)** in this disease. That protein, tau **(rhymes with "cow")**, may contribute to the pathology of this disease by forming clumps called neurofibrillary **(neuro-FIB-rill-ary)** tangles. Other signs appearing with this disorder include widespread aggregations of amyloid **(AM-uh-loyd)** beta peptides, also known as senile plaques. For 10 points, name this age-related neurodegenerative disorder characterized by progressive dementia.
ANSWER: **Alzheimer's** [prompt on **tauopathies** before "tau" is read; prompt on **dementia** before it is read]

2. This team's successful third-down blitz against Vernon Adams resulted in a three-point win over Oregon in September 2015, and they won another game in October 2015 after Rutgers quarterback Chris Laviano spiked the ball on fourth down. This team won the 2015 Paul Bunyan trophy after a running back fumbled a punt snap with no time left to defeat their in-state rival. This Mark Dantonio-coached team defeated Iowa in the Big Ten Championship Game. For 10 points, name this school whose Spartans play home football games in Lansing.
ANSWER: 2015 **Michigan State** University football team [prompt on **Spartan**s until it is read; prompt on **MSU**; do not accept "Michigan"]

3. The title character of this novel works as a housekeeper for a moneylender who later shoots himself, immediately after murdering his wife so that she cannot inherit his money. This novel's narrator takes his studies to Harvard after becoming distracted in Lincoln attending plays with a Norwegian dressmaker named Lena Lingard. This novel is narrated by Jim Burden, who recollects his shared youth in Nebraska with the title Bohemian girl. For 10 points, name this novel by Willa Cather.
ANSWER: ***My Antonia***

4. For an input *x*, the signum **(sig-num)** function can be defined as *x* over this operation on *x*. For numbers of the form *a* plus *b i*, this operation yields the square root of *a* squared plus *b* squared. If this operation is applied to *x* in the inequality *x* is less than six, the solution is minus six is less than *x* is less than six. An intuitive definition of this operation is that it gives a number's distance from zero. For 10 points, identify this operation symbolized by vertical bars and which returns a positive number *x* when minus *x* is input.
ANSWER: **abs**olute value [or **modulus**]

5. This country experienced a constitutional crisis after John Kerr dismissed Gough **(goff)** Whitlam as Prime Minister and replaced him with Malcolm Fraser **(fray-zer)**. This country's Liberal Party was founded by Robert Menzies **(Mingus)**. In 2008, Kevin Rudd apologized for the "Stolen Generations" of this country's indigenous people. James Cook's exploration of this country helped to lead to its establishment as a penal colony. For 10 points, name this Commonwealth nation that is governed from Canberra.
ANSWER: Commonwealth of **Australia**

6. This country's most populous city is home to the Malecón **(mah-LAY-sohn)** 2000 boardwalk along the Guayas **(guay-ahs)** River. This country discontinued its sucre **(SOO-kray)** currency in 2000 and replaced it with the U.S. dollar. Frederick Edwin Church painted the eruption of Cotopaxi **(coh-toh--PAK-see)** in this country, whose other volcanoes include Chimborazo, home to the farthest point from the Earth's center. Charles Darwin observed finches on this country's territory. For 10 points, name this country that owns the Galápagos Islands and is named for its location on zero degrees latitude.
ANSWER: **Ecuador** [or Republic of **Ecuador**; or República del **Ecuador**]

7. This man's activities were funded by the Rosenwald Fund set up by a co-owner of Sears and Roebuck. He once gave a speech saying that Americans could be "as separate as the fingers, yet one as the hand." In that speech, this man repeatedly told his audience to "cast down your bucket where you are." This author of the autobiography *Up From Slavery* gave the Atlanta Exposition address, urging blacks to concentrate on industrial education. For 10 points, name this African-American leader who founded the Tuskegee Institute.
ANSWER: Booker T. **Washington** [Booker Taliaferro **Washington**]

8. The first experiment to attempt to find evidence of this thing was Project Ozma at Green Bank. This thing is the objective of Yuri **(yoo-ree)** Milner's Breakthrough Listen initiative. The first pulsar to be discovered was mistaken for evidence of this thing and given the name LGM-1. The Arecibo **(ah-ray-SEE-boe)** Observatory in Puerto Rico collects data for a namesake at home project whose goal is to find evidence of this thing. An estimate of its distinct occurrences is provided by the Drake equation. For 10 points, finding evidence of what thing is the goal of the SETI project?
ANSWER: finding **extraterrestrial life** [or detecting **alien** life; or intelligent **alien**s; or **extraterrestrial civilization**s; or **alien communication**; or **little green men**; or obvious equivalents]

9. These people practice a two-stage funeral in which the primary burial involves waiting for flesh to rot away, followed by painting bones with red ochre. Many of these people practice a rite of passage known as the Bora, in which parts of a tooth or finger are amputated. They formerly used another ritual for adolescents, the walkabout. These people believe that supernatural entities live in the "Dreamtime" and ritually restrict the playing of the didgeridoo to men. For 10 points, name these people who inhabited a large island continent prior to the arrival of Europeans.
ANSWER: Australian **Aborigine**s [or equivalents such as **indigenous Australian**s]

10. A woman in this novel bequeaths 3,000 rubles to the protagonist's sister upon dying of "apoplexy." In this novel, the drunkard Marmeladov **(mar-MAY-luh-doff)** is escorted home from a tavern by the protagonist and is later killed by a carriage. The detective Porfiry Petrovich **(por-FEER-ee peh-TRO-vitch)** pursues the protagonist of this novel, who is eventually exiled to Siberia after murdering the pawnbroker Alyona **(al-YO-nuh)** and her half-sister Lizaveta **(lee-zuh-VYET-uh)**. For 10 points, name this novel about the student Raskolnikov **(rahs-KOL-nee-koff)**, written by Fyodor Dostoevsky.
ANSWER: ***Crime and Punishment*** [or ***Prestupleniye i Nakazaniye***]

11. A member of this family owned a location where about 24 strikers were killed at Ludlow, Colorado, in April 1914. Another of its members was the major force behind the "Cleveland Conquest" that used vertical and horizontal integration to squash corporate rivals. A member of this family worked with Reverend W.A.R. Goodwin to set up Colonial Williamsburg. The wealthy patriarch of this family was critiqued by Ida Tarbell in her muckraking 1904 book. For 10 points, name this family whose patriarch John was the head of the Standard Oil Company.
ANSWER: **Rockefeller**

12. In an opera by this composer, a serenade by the poor student Lindoro warms the heart of a soprano that sings the aria "Una voce poco fa" **(OOH-nah VOH-chay POH-koh FAH)**. In that opera by this composer, Bartolo conspires with the tutor Brasilio in order to marry Rosina. In one of his operatic overtures, a storm is followed by a Ranz des Vaches **(RAHNZ duh VAWSH)** and a march of Swiss cavalrymen. The title character of another of his operas introduces himself in the baritone aria "Largo al factotum." For 10 points, name this composer of *The Barber of Seville* and *William Tell*.
ANSWER: Gioachino **Rossini** [or Gioachino Antonio **Rossini**]

13. This character accidentally kills the shape changing dwarf Otr, who is in the form of an otter. This being poses as a maid while accompanying a warrior to Jotunheimr **(JOH-ten-heim-er)**. He is punished by having a serpent drip venom on him while he is bound, although his wife Sigyn collects the venom in a bowl. This god is fated to kill and be killed by Heimdall **(HEIM-doll)**. He is the father of two monsters, the wolf Fenrir and the world serpent Jormugandr **(JOHR-moo-gand-er)**, both of which will run wild at Ragnarok. For 10 points, name this fiendish Norse god.
ANSWER: **Loki** [or **Hveorungr**]

14. The antagonist of this film has an early memory of the song "Daisy Bell" and at one point reads Frank Poole and Dave Bowman's lips despite their efforts to hide in an EVA pod. Its opening sequence, "The Dawn of Man," ends with a bone being thrown in the air and a sudden jump cut to outer space. Much of this film takes place on the *Discovery One* spacecraft, which is run by the malfunctioning computer HAL 9000. For 10 points, name this Stanley Kubrick film in which an astronaut encounters a mysterious black monolith.
ANSWER: ***2001****: A Space Odyssey*

15. Lysosomes lose function in I-cell disease due to a defect in an enzyme in this organelle that normally phosphorylates **(foss-FOR-uh-laytes)** mannose to make mannose-six-phosphate. This organelle performs O-linked glycosylation **(gly-COSS-uh-lation)**. COP **("cop")**-one- and clathrin-coated vesicles bud from this organelle's namesake *trans* network. This organelle's stacks, or cisternae **(sih-STIR-nee)**, are the site of protein packaging. For 10 points, name this organelle that receives proteins from the ER and was discovered by an Italian.
ANSWER: **Golgi** apparatus [or **Golgi** body]

 **2016 VHSL Regionals - Round 01 - Directed Period**

1A. In 2015, China barred Anastasia Lin, a Canadian entrant in what competition, from entering the country over her criticism of the country's Falun Gong policy?
ANSWER: **Miss World**

1B. What largest Protestant denomination in the United States was formed in 1845 by slaveholders after the failure of the Alabama Resolutions?
ANSWER: **Southern Baptist** Convention [or **Southern Baptist**s; do not accept "Baptists" alone]

2A. What property is the tendency for a mass to resist changes to its motion in the absence of external unbalanced forces?
ANSWER: **inertia**

2B. 18th-century philosophers often discussed Enlightenment ideas at what gatherings, which were usually hosted by women like Madame Geoffrin?
ANSWER: **salon**s

3A. This is a 20-second calculation question. If two fair dice are rolled, what is the probability that the sum of the numbers shown is even?
ANSWER: **1/2** [or **0.5**]

3B. This is a 20-second calculation question. Express the quantity "the square root four-seventeenths" in simplest radical form.
ANSWER: **2** times the square **root** of **17, all over 17** [or **2** times **rad**ical **17, all over 17**]

4A. What Harlem Renaissance poet asked, "What happens to a dream deferred?" in his poem "Harlem"?
ANSWER: Langston **Hughes**

4B. What Impressionist included a wig and real tutu on his sculpture of a young ballerina, titled *Little Dancer of Fourteen Years*?
ANSWER: Edgar **Degas** [Hillaire-Germain-Edgar **Degas**]

5A. The largest old-growth forest east of the Mississippi is found in what subrange of the Appalachians, which straddles the Tennessee-North Carolina border?
ANSWER: Great **Smoky** Mountains

5B. What Shoshone woman traveled with the Lewis and Clark expedition, serving as a guide and interpreter?
ANSWER: **Sacagawea** [or **Sakakawea**]

6A. What game by Blizzard Entertainment is the most popular MMORPG of all time, by total number of players?
ANSWER: *World of* ***Warcraft*** [or **WOW**]

6B. In what figure of speech similar to metonymy **(meh-TAH-nuh-mee)** does a part of something represent the whole thing, as in the use of "wheels" to mean "car"?
ANSWER: **synecdoche** **(sin-EK-duh-kee, but accept other pronunciations)**

7A. In what Evelyn Waugh novel does Oxford student Charles Ryder visit the title estate and acquaint himself with the family of the Catholic Sebastian Flyte?
ANSWER: ***Brideshead Revisited***

7B. Hendrik Lorentz and Henri Poincaré **(awn-ree pwan-cah-ray)** laid the foundations for what field of physics developed by Albert Einstein?
ANSWER: special **relativity** [or **SR**]

8A. This is a 30-second calculation question. There are exactly four positive arc lengths between 0 and 2 pi for which either tangent of x or cotangent of x equals 2. What is the cosine of the largest of those arc lengths? Express your answer in simplest radical form.
ANSWER: **negative** square **root** of **5, over 5** [or **negative rad**ical **5, over 5**]

8B. This is a 30-second calculation question. A ball of volume 288 pi cubic inches is to be displayed in a cubical case. What is the minimum volume of the case?
ANSWER: **1728** cubic inches [or **1 cubic foot**]

9A. What contemporary English novelist of *The Old Devils* wrote about a lecturer of medieval history who insults his superior Professor Welch during a lecture on "Merrie England" in *Lucky Jim*?
ANSWER: Kingsley **Amis**

9B. What 1933 Constitutional amendment, the only one to use ratifying conventions, repealed the Eighteenth Amendment to end Prohibition?
ANSWER: **Twenty-First** Amendment

10A. What fatty substance found as a sheath around axons in white matter is produced by Schwann cells and oligodendrocytes **(aw-lih-go-DEN-dro-sites)** and is degraded in multiple sclerosis?
ANSWER: **myelin**

10B. What Dutch-derived language is one of three, along with Xhosa **(KOH-suh)** and Zulu, that is more widely spoken than English in South Africa?
ANSWER: **Afrikaans**

 **2016 VHSL Regionals - Round 01 - Third Period, Fifteen Tossups**

1. In 2013, this actor played the philandering Trent Ramsey, who insults the adolescent protagonist Duncan throughout the film *The Way, Way Back*. In the same year, he played a character who meets Rance Holloway at a retirement home before designing a "disappearing audience" trick in *The Incredible Burt Wonderstone*. This voice of Gru in *Despicable Me* spent five years on *The Daily Show* before he was cast as a character who eventually moves to Colorado with Holly Flax. For 10 points, name this portrayer of Michael Scott on *The Office*.
ANSWER: Steve **Carell** [Steven John **Carell**]

2. This institution featured a split between the progressive "Three Musketeers" and the "Four Horsemen." A member of this institution, Owen Roberts, performed the "switch in time" that relieved White House pressure. The four conservative members of this institution annoyed the president so much that he sought to add new members whenever current ones reached the age of 70. For 10 points, name this institution which Franklin Roosevelt sought to expand the size of, as part of a "packing" scheme that would have made more than nine justices.
ANSWER: **Supreme Court** of the United States

3. In this story, a man references a forger named Monroe Edwards who died at Sing-Sing. A landlord in this story has a character removed by the police and confined to the Tombs, where he starves to death. The narrator of this story talks about his experiences with a former employee of the Dead Letter Office who works alongside Turkey, Nippers, and Ginger-Nut. For 10 points, name this short story by Herman Melville whose title character repeatedly states, "I would prefer not to."
ANSWER: "**Bartleby, the Scrivener**: A Story of Wall-street"

4. A technique used alongside these devices uses a variable attenuator to decrease the quality factor of the gain medium. These devices require that the atoms in the gain medium are pumped into a state in which more atoms are in an excited state than the ground state, called population inversion. In these devices, electrons falling into lower energy levels emit photons at a specific wavelength. For 10 points, name these devices which emit coherent light by stimulated emission.
ANSWER: **LASER** [or **light amplification by stimulated emission of radiation**]

5. Companions to this treaty included the Treaty of Neuilly **(NEW-yee)** and the Treaty of Saint-Germain-en-Laye. Article 231 of this treaty was its controversial "guilt clause." Vittorio Orlando and a man nicknamed "the Tiger" were present at the creation of this treaty. During the drafting of this treaty, George Clemenceau **(clehm-ehn-SOE)** pushed for the exaction of large reparations and rejected Woodrow Wilson's fourteen points. For 10 points, identify this treaty that created the League of Nations, was signed in a French palace, and ended World War I.
ANSWER: Treaty of **Versailles (ver-SIGH, but accept phonetic pronunciations)**

6. This city's ruins were long believed to be at the Pinarbasi **(PIN-ar-boss-ee)** hill. This place was found on layer seven of the mound of Hisarlik **(HISS-ar-lik)**. Three years after discovering this city's ruins, the man who found it started digging at Mycenae **(my-SEE-nee)** and claimed to find the golden death mask of Agamemnon. The artifacts known as "Priam's Treasure" and the "Jewels of Helen" were found here in 1871 by archaeologist Heinrich Schliemann **(SHLEE-mun)**. For 10 points, name this city which mythically was conquered with a large horse.
ANSWER: **Troy**

7. This region's Lake Vanda is saltier than the Dead Sea. Two volcanoes in this region were named for the *Erebus* and *Terror*, two ships that landed on it in 1841. Many visitors to this region stay at McMurdo Station. Lake Vostok was discovered directly below a research station on this landmass. Some of the largest observed ozone holes formed over this landmass, where the explorer Robert Falcon Scott perished weeks after finding a Norwegian flag planted by Roald Amundsen. For 10 points, name this continent inhabited by penguins and home to the South Pole.
ANSWER: **Antarctica**

8. An event in this city prompted a newspaper to fixate on the supposed bigotry of Nicholas Thalasinos; that newspaper also printed the headline "God Isn't Fixing This." After events in this city, MSNBC and CNN reporters were criticized for filming inside an apartment in the nearby city of Redlands. Its Inland Regional Center was the site of a county Department of Public Health holiday party attacked by Tashfeen Malik and her husband. For 10 points, name this California city that was the site of a mass shooting on December 2, 2015.
ANSWER: **San Bernardino**

9. In this city, a man happily noted that a painted sun on a chair was now "a rising and not a setting Sun." That man proclaimed events in this city "will astonish our enemies." In this city, Roger Sherman's Connecticut Compromise negotiated between William Paterson's New Jersey Plan and Edmund Randolph's Virginia Plans. The three-fifths compromise proposed in this city placated southern states into accepting a replacement for the Articles of Confederation. For 10 points, name this Pennsylvania city where the Constitutional Convention convened.
ANSWER: **Philadelphia**

10. In a novel by this author, Merton Densher is pressured into courting the terminally ill heiress Milly Theale. In another novel by this author, Ralph Touchett persuades his dying father to leave a fortune to his cousin, who moves to Rome and marries the tyrannical Gilbert Osmond. This creator of Isabel Archer also wrote about the children Miles and Flora, who are haunted by the ghosts of Miss Jessel and Peter Quint. For 10 points, name this American novelist of *The Portrait of a Lady,* and *The Turn of the Screw.*
ANSWER: Henry **James**

11. This formula can be derived as follows: divide the equation by the first coefficient, move the constant term to the right-hand side of the equation, complete the square, take the square root, and subtract any remaining constants. The axis of symmetry of a parabola is given by the non-radical term in this formula. If a part of this formula is zero, the solution is a double root. The discriminant in this formula is equal to *b* squared minus 4 *a c*. For 10 points, name this formula used to algebraically solve equations of the form *a x* squared plus *b x* plus *c* equals zero.
ANSWER: **quadratic** formula

12. A constant symbolized by a lowercase b is divided by this quantity to find the peak wavelength according to Wien's law. The energy radiated per unit surface area is proportional to the fourth power of this quantity of a blackbody according to the Stefan-Boltzmann law. This quantity is proportional to the average kinetic energy per particle of an ideal gas. For 10 points, name this quantity measured absolutely on the Kelvin scale.
ANSWER: **temperature**

13. This essay praises "the nonchalance of boys who are sure of a dinner" as "the healthy attitude of human nature." This essay is prefaced with a quatrain concluding, "Power and speed be hands and feet." This essay's author claims that "An institution is the lengthened shadow of one man." This essay concludes with the exhortation, "Nothing can bring you peace but yourself," and it includes the famous aphorism, "A foolish consistency is the hobgoblin of little minds." For 10 points, name this essay attacking conformity written by Ralph Waldo Emerson.
ANSWER: "**Self-Reliance**"

14. This artist depicted a tuft of grasses including yarrow and dandelion in his *Great Piece of Turf.* One piece by this artist, which hides its date of composition in a four-by-four magic square, depicts a truncated polyhedron and a winged figure with her head in her hand. This Renaissance artist from Nuremburg also created a fifteen-image series of scenes from the Book of Revelation. For 10 points, name this German whose woodcuts include *Melencolia I* and *The Four Horsemen of the Apocalypse*.
ANSWER: Albrecht **Durer**

15. While over Libya, this hero inadvertently created deadly serpents by spilling toxic blood. In one account, he accidentally killed someone with a discus; that person was Acrisius **(uh-criss-ee-ehss)**, his father, the King of Argos. While visiting the Graeae **(gray-eye)**, this man was given Hades' helm of darkness and a special shield by Athena. On his way home, he stopped off to defeat a sea serpent and save Andromeda. This man killed a monstrous Gorgon whose gaze turned men into stone. For 10 points, name this Greek hero who killed Medusa.
ANSWER: **Perseus**

 **2016 VHSL Regionals - Round 01 - Tiebreaker Questions**

1. This composer evoked the halling dance and incorporated an opening timpani roll into his *Piano Concerto in A Minor*. He wrote a set of incidental music whose sections include a depiction of a Moroccan sunrise and a repetitive B minor piece which speeds up as its protagonist is chased by goblins. For 10 points, name this Norwegian composer who included "Morning Mood" and "In The Hall Of The Mountain King" in his *Peer Gynt* Suite.
ANSWER: Edvard **Grieg** [Edvard Hagerup **Grieg**]

2. During this emperor's reign, Lucius Murena accused him of ordering an attack on the kingdom of Thrace. This Emperor during the Marcus Primus Affair allegedly yelled "Varus, give me back my legions!" after his forces lost at the Battle of Teutoburg Forest. This emperor founded the Praetorian Guard, and his admiral Agrippa won the Battle of Actium. With Marcus Lepidus and Mark Antony, this man formed the Second Triumvirate. For 10 points, name this successor of Julius Caesar and first Roman Emperor.
ANSWER: **Augustus** Caesar [Gaius Julius Caesar **Octavian**us; or Gaius **Octavius**]

3. In a story in this collection, a murdered boy continues to sing the "Alma Redemptoris Mater" after having a grain placed on his tongue by the Virgin Mary. In another story in this collection, the student Nicholas convinces the carpenter John of an impending flood sent by God so he can sleep with his wife Alisoun. Guinevere charges a knight accused of rape to find "what thing it is that women most desire" in a story in this collection told by the Wife of Bath. For 10 points, name this Middle English collection of stories narrated by pilgrims, written by Geoffrey Chaucer.
ANSWER: *The* ***Canterbury Tales***

4. Vasari gave this painting its title when he saw it in the Villa di Castello. On the right of this painting, the blue-skinned god Zephyrus abducts Chloris. Mercury reaches for a fruit on the left of this painting, which features the three Graces dancing in a circle. This painting is set in an orange grove and was completed a few years before its artist's *The Birth of Venus.* For 10 points, name this allegorical depiction of spring by Sandro Botticelli
ANSWER: ***Primavera*** [or ***Allegory of Spring*** before mentioned]

5. For an isosceles triangle whose angle opposite the base is one-fifth pi radians, this number is yielded by dividing either of its equal sides by the base. A logarithmic spiral with this number as the growth factor is obtained by creating quarter-circle arcs inscribed in squares with side length equal to the Fibonacci sequence. For quantities *a* and *b* where *a* is greater than *b*, this number is defined as *a* plus *b* over *a* equals *a* over *b*. For 10 points, name this ubiquitous number in nature and mathematics, often represented as phi and equal to approximately 1.618.
ANSWER: **golden ratio** [or **golden mean**; or **golden section**; or **golden proportion**; or **golden cut**; or **golden number**; or **divine proportion**; or **divine mean**; or **phi** until it is read]

What is the name for the group of land plants characterized by the presence of flowers, in contrast to gymnosperms **(JIM-no-sperms)**?
ANSWER: **angiosperm**s

This is a calculation question. In a class, there are 6 students with only a dog, 5 students with only a cat, 3 students with both a cat and a dog, and 6 students with neither a cat or a dog. What is the marginal frequency of students having a dog?
ANSWER: **0.45** [or **9/20**]