**VHSL Regular Season 2016-2017 - Round 24 - First Period, Fifteen Tossups**

1. This macroscopic process can be modeled by simulating Brownian motion of particles. The kinetics of the steady-state form of this process are described by Fick's first law, which states that the flux of this process is equal to the negative gradient of concentration. For 10 points, osmosis across a semi-permeable membrane is an example of what transport process in which particles move from an area of high concentration to an area of low concentration?
ANSWER: **diffusion** [or **osmosis** until it is read]

2. The U.S. entered this country to restore President Jean-Bertrand Aristide to power. Its revolution was led by Toussaint Louverture (LUH-oh-VER-sher) back when it was known as the Saint-Domingue colony. Once led by both "Papa Doc" and "Baby Doc" Duvalier, this country is the only nation established as a successful slave revolt after an 1804 uprising against the French. For 10 points, what Caribbean country shares an island with the Dominican Republic?
ANSWER: Republic of **Haiti**

3. In a poem by this man, the speaker recalls being told, "give pounds and crowns and guineas, but not your heart away." Another poem by this man begins by recalling to the addressee how "we chaired you through the market-place" when "you won your town the race." For 10 points, name this poet of *A Shropshire Lad* who wrote "When I was one-and-twenty" and "To an Athlete Dying Young."
ANSWER: A. E. **Housman** [or Alfred Edward **Housman**]

4. This desert is home to the abandoned town of Humberstone, which used to produce saltpeter and is now one of many "nitrate towns." NASA has used this desert to simulate Mars-like environments, as scientific tests could determine no signs of life in the region of Yungay. The average rainfall in this desert is just 0.6 inches per year. For 10 points, what South American location is the driest non-polar desert in the world?
ANSWER: **Atacama** Desert

5. This faculty is greatly improved in individuals with hyperthymesia, a condition in which one spends an inordinate amount of time thinking about the past. Many psychologists today believe that the "eidetic" (EYE-det-ICK) type of this faculty is an unsubstantiated myth. It is common to use the technique of "chunking" to improve both the short-term and long-term components of this faculty. For 10 points, name this human ability to store and recall information.
ANSWER: **memory**

6. This symphony's fourth movement is subdivided into four inner sections, resembling a symphony-in-a-symphony. In this symphony, a bass soloist describes a "beautiful, divine spark" and a "daughter from Elysium," quoting from a poem by Friedrich Schiller. After its premiere, this symphony's composer could not hear the audience's thundering applause due to his deafness. For 10 points, name this last symphony by Beethoven, which includes the "Ode to Joy."
ANSWER: **Beethoven's Ninth** Symphony [or ***Choral*** Symphony; or Symphony No. **9** by Ludwig van **Beethoven**; or **Ninth** Symphony after "Beethoven" is read; or Symphony No. **9** after "Beethoven" is read; prompt on "Ode to Joy"]

7. Thermogenin (thermo-JEN-in) is found in a mitochondria (my-toh-KON-dree-uh)-rich form of this tissue. Instead of shivering, hibernating animals and newborns produce heat using that "brown" type of this tissue. The namesake triglycerides (try-GLIS-uh-rides) found in lipid droplets in this tissue yield nine kilocalories per gram. For 10 points, name this energy-storing tissue also called adipose (AA-duh-pohce) that is found in blubber and increased in obesity.
ANSWER: **fat** [or word forms or types of **fat**; or **adipose** before it is read; prompt on connective tissue]

8. A surviving one of these things is the Pont du Gard in France, while another is in Segovia, Spain, both former territories of the empire that built them. It's not a road, but the namesake of the Appian Way constructed the first one of these things that mostly ran underground. These artificial things supplied the necessary material for ancient "thermae," or public baths. For 10 points, the Romans used what artificial constructs to transport water?
ANSWER: **aqueducts** [prompt on waterway]

9. Short stories by this author that have been adapted into cinematic thrillers include "Don't Look Now" and "The Birds." In a novel by this woman, the narrator is tricked into wearing the same dress as a dead woman in a portrait by the housekeeper Mrs. Danvers. That novel by this woman begins, "Last night I dreamt I went to Manderley again." For 10 points, name this British author who wrote *Rebecca.*
ANSWER: Daphne **du Maurier** (MOW-ree-AY) [prompt on Lady Browning]

10. This company's longtime head official was Big John McCarthy, who felt its turning point was a 2002 event featuring Ken Shamrock. Prior to its 200th event in July 2016, Jon Jones was busted for an Anti-Doping Violation. Despite its recent billion dollar sale, Dana White remains the president of this company, whose first female champion was Ronda Rousey. For 10 points, what company is the largest mixed martial arts promotion in the world?
ANSWER: **UFC** [or The **Ultimate Fighting Championship**]

11. This radiation can be produced when high-energy electrons undergo inverse Compton scattering. The so-called "soft" type of this radiation is periodically emitted from namesake "repeaters". The brightest known events in the universe are "bursts" of this kind of radiation, which lies beyond ultraviolet and X-ray radiation on the electromagnetic spectrum. For 10 points, what type of electromagnetic radiation, denoted by a Greek letter, consists of high-energy photons?
ANSWER: **gamma** rays

12. Euclid's demonstration of the infinitude of the primes is a "constructive" example of this type of result. A "direct" example of this type of result extends from a base case using induction. In geometry, it is common to show this type of result in a two column table, with headings of "statements" and "reasons." For 10 points, name this type of deductive argument in mathematics which formally demonstrates some result and which might end with the letters "QED.".
ANSWER: mathematical **proof**s

13. This man argued that Gentiles should not have to follow the Torah, opposing Peter at the Antioch Incident. John, Mark, and Barnabas accompanied him on his first missionary journey. In one of his writings, this figure urged the addressee to pardon his escaped slave Onesimus (oh-NEH-si-MUSS). This man stopped persecuting Jesus's followers after being blinded on the road to Damascus. For 10 points, name this author of many epistles, an apostle born Saul of Tarsus.
ANSWER: **Paul** the Apostle [or **Saul** of Tarsus until "Saul" is read]

14. The original choreography for a ballet by this composer was recovered by the Joffrey Ballet in the 1980s. The title creature is found near a magic apple tree by Prince Ivan in a ballet by this composer. A ballet by him earned controversy for opening with a bassoon solo. Riots accompanied the premiere of his ballet depicting a Siberian girl's ritual sacrifice. For 10 points, name this Russian composer of *The Firebird* and *The Rite of Spring*.
ANSWER: Igor **Stravinsky**

15. A phrase meaning love for this city is "laconophilia" (LUH-con-oh-FIL-ee-ah). Its council of elders, the gerousia, would decide if newborns should be left alive or thrown into a pit. Subjects from lands conquered by this city were known as helots (HELL-utts). Soldiers from this city under Leonidas held off the Persians for days at the Battle of Thermopylae (THERM-op-uh-LAY). For 10 points, what ancient Greek city-state obsessively focused on military training?
ANSWER: **Sparta** [or **Lacedaemon**]

 **VHSL Regular Season 2016-2017 - Round 24 - Directed Period**

1A. What U.S. President was shot to death by a deranged office seeker named Charles Guiteau (GEE-toe)?
ANSWER: James Abram **Garfield**

1B. In *Space Jam*, Michael Jordan and the Looney Toons join forces against what team of newly-enlarged aliens?
ANSWER: the **Monstars** [or **Nerdlucks**]

2A. The title aristocrat kills his friend Lensky in a duel in what verse novel by Alexander Pushkin?
ANSWER: ***Eugene Onegin*** (oh-NAY-gin) [or ***Yevgeny Onegin***]

2B. In what novel by Jose Saramago (sah-ruh-MAH-go) does the title "white sickness" spread through an entire country?
ANSWER: ***Blindness*** [or ***Essay on Blindness***; or ***Ensaio sobre a Cegueira***]

3A. This is a 20-second calculation question. Four less than two thirds of a number is twenty. Find the number.
ANSWER: **thirty-six**

3B. This is a 20-second calculation question. If two standard six-sided dice are rolled, what is the probability the sum of the dice is ten?
ANSWER: **1/12**

4A. What general and Secretary of State names a plan for rebuilding Europe after World War II?
ANSWER: George **Marshall** Jr.

4B. The "fundamental theorem" of what branch of mathematics states that every non-constant polynomial with complex coefficients has at least one complex root?
ANSWER: fundamental theorem of **algebra**

5A. What scandal during the Harding presidency involved an illegal leasing of oil reserves found at a namesake location in Wyoming?
ANSWER: **Teapot Dome** scandal

5B. Sour cream is often served with what eastern European soup made from beetroot?
ANSWER: **borsch**t

6A. What principle states that when two waves overlap, they can be considered one wave that has the sum of both waves's amplitude?
ANSWER: **superposition** principle

6B. What kind of jewel is "as Big as the Ritz" in a story by F. Scott Fitzgerald?
ANSWER: **diamond**

7A. In Latin, which of the five standard noun cases is used to indicate possession or composition?
ANSWER: **genitive** case

7B. An archer might store his arrows or darts in what container, derived from a Middle English word meaning "flask"?
ANSWER: **quiver**

8A. The Watsons are building a pool in their backyard and have a 38 foot by 43 foot space in their backyard to work with. They want a 4 foot wide walkway around the entire pool, which will be 10 feet deep. If they use all the available space, find, in cubic feet, the volume of the pool.
ANSWER: **10500** cubic feet

8B. This is a 30-second calculation question. If the sine of theta equals three over five, what is the absolute value of the cosine of theta?
ANSWER: **4/5**

9A. Which law states that the direction of an induced current opposes the change in magnetic flux?
ANSWER: **Lenz**'s law

9B. At the 2016 Republican National Convention, Sheriff David A. Clarke uttered what three-word phrase that controversially alters the name of an African-American activist group to express support for police officers?
ANSWER: **Blue Lives Matter** [do not accept "All Lives Matter," do not accept "Black Lives Matter"]

10A. Rodolfo falls in love with Mimi in what Giacomo Puccini (jah-co-moh poo-chi-nee) opera about the poor of Paris?
ANSWER: ***La bohème***

10B. Epistemology is the philosophical study of what concept?
ANSWER: **knowledge**

 **VHSL Regular Season 2016-2017 - Round 24 - Third Period, Fifteen Tossups**

1. During this person's reign, a prolific playwright wrote the narrative poems *Venus and Adonis* and *The Rape of Lucrece* (loo-"CREASE"). The career of Christopher Marlowe began and ended during this person's reign. This person was allegorized as Gloriana, the title character of Edmund Spenser's *The Faerie Queene.* For 10 points, name this queen during whose reign William Shakespeare wrote many plays.
ANSWER: **Elizabeth** I

2. In a novel by this author, Dr. Preobrazhensky (PRAY-oh-brah-ZHEN-skee) implants a human pituitary gland in the title animal, Sharik (shah-REEK). In addition to parodying the Soviet revolution in *The Heart of a Dog*, this author wrote a novel in which the first title character's novel about Pontius Pilate is produced by the devil Woland. For 10 points, name this 20th-century Russian author who wrote *The Master and Margarita.*
ANSWER: Mikhail **Bulgakov** (bull-GAH-koff)

3. A possible ancient writing system discovered on this island is called "rongorongo." While over 6,000 people live on this island, the nearest inhabited land to it is over 1,200 miles away and is the British owned Pitcairn Island. The moai (moh-AY) were created on this island by the Rapa Nui (NOO-ee) people. It was named by a Dutch explorer who found it on a holiday in 1722. For 10 points, what island owned by Chile contains 887 carved human figures with oversized heads?
ANSWER: **Easter** Island [or **Rapa Nui** until it is mentioned]

4. This director had his wife Rita Hayworth bleach her hair to play the title character of his film *The Lady from Shanghai.* RKO Pictures truncated his Booth Tarkington adaptation, *The Magnificent Ambersons*, after giving him final cut of his innovative film about a newspaper magnate based on William Randolph Hearst. For 10 points, name this American film and radio actor who directed *Citizen Kane.*
ANSWER: Orson **Welles**

5. In December 2015, this band released a rejected theme song for the James Bond movie *Spectre*. In June 2016, fans of this band in Istanbul were attacked for drinking beer during Ramadan. This band deleted their social media accounts before releasing "Burn the Witch" and the album *A Moon Shaped Pool*. Their breakout single includes the line "I wish I was special." For 10 points, name this band led by Thom Yorke that previously released *OK Computer* and the song "Creep."
ANSWER: **Radiohead**

6. This man led a revolt that overthrew his country's only king, Idris. His pro-socialist viewpoints were spelled out in his text *The Green Book*. This world leader accepted responsibility for the terrorist bombing of Pan Am Flight 103 over Scotland. He was killed in Sirte during a 2011 civil war that was part of the Arab Spring and featured his troops opening fire on protesters in Benghazi (ben-GOZZ-ee). For 10 points, what dictator led Libya from 1969 to 2011?
ANSWER: Muammar **Gaddafi** [or Muammar Muhammad Abu Minyar al-**Gaddafi**]

7. This rock's two major classes are arenite (AHR-uh-nite) and wacke (WACK-uh), and ones rich in feldspar are classified as arkose. During metamorphism, this rock loses its clastic structure and becomes quartzite. This rock is named for a fine-grained material that is smaller than gravel but larger than silt. The second-most common sedimentary rock after shale, it is red when cemented by iron oxide. For 10 points, what rock is named for a material found on beaches?
ANSWER: **sandstone**

8. A church based in this present-day country is currently led by Theodore II. In this country, a Biblical character spends two years in prison after being accused of assaulting Potiphar's wife. After the birth of Jesus, Joseph and Mary traveled here on a journey known as the "the flight to" this country. For 10 points, name this home country of the Coptic Church, where Joseph was tasked with interpreting the dreams of the Pharaoh.
ANSWER: **Egypt**

9. In this city, Kevin James Loibl (LOY-bill) killed singer Christina Grimmie. Three days after an event that took place here, Connecticut Senator Chris Murphy began a 14 hour filibuster. During a 9-1-1 call made in this city, a man called the Boston Marathon bombers his "homeboys" and pledged allegiance to ISIL. In this city, Omar Mateen killed 49 people. For 10 points, what Florida city was the site of a June 2016 mass shooting inside the Pulse nightclub?
ANSWER: **Orlando**

10. This deity disguises himself as the giantess Tokk so Hel will not be able to grant a request of Hermod's. This god's wife Sigyn (SIG-unn) catches poison dripped on him. While captive, this god's writhing in pain causes earthquakes. He fathered the wolf Fenrir (fen-REER) by the giantess Angrboda (AHN-ger-BOH-da). This deity tricked Hoder into throwing mistletoe at the presumably invulnerable god Balder. For 10 points, name this Norse trickster god.
ANSWER: **Loki** (LOH-kee)

11. This type of substance was discovered by Pyotr Kapitsa. Lev Landau introduced rotons while working on a theory of this type of substance. In the fountain effect, this type of substance can creep up the side of a container as a Rollin film because this type of fluid can flow without losing kinetic energy. At the lambda point of around 2.1 Kelvins, helium-4 transitions into this type of fluid. For 10 points, what type of fluid has zero viscosity?
ANSWER: **superfluid**s [or **superfluidity**]

12. The title character of this novel is bullied by Noah Claypole and used as a mourner while working as an apprentice to the undertaker Mr. Sowerberry. In this novel, Bill Sikes murders his lover Nancy, who helps the title character when he is entangled with a gang led by the Jewish criminal Fagin. For 10 points, name this Charles Dickens novel about an orphan who famously asks for more gruel.
ANSWER: ***Oliver Twist***

13. A method named for Ramanujan famously assigns a value of minus one-twelfth to one of these things. The root and ratio tests can be used to determine the convergence of these constructs. The Maclaurin examples of these constructs, which are centered at zero, are a subset of ones named for Taylor. These constructs are often written using an uppercase sigma. For 10 points, name these mathematical constructs that sum the entries of a sequence.
ANSWER: **series** [or power **series**; or divergent infinite **series**; do not accept "sequences"]

14. Violence began in this state after Marquette Frye was arrested for drunk driving. Before becoming Chief Justice, Earl Warren was governor here, and Richard Nixon unsuccessfully ran for governor here in 1962. People converged on the Haight-Ashbury neighborhood in this state during the "Summer of Love." In 1965, the racially motivated Watts riots broke out in this state. For 10 points, what state was the site of massive student protests at Berkeley?
ANSWER: **California**

15. This case's companion case involved Georgia Attorney General Arthur Bolton. The plaintiff, Norma McCorvey, is now an opponent of its decision. The majority decision in this case argued the state has a "compelling interest" to intervene after the first trimester is complete, a framework later rejected in a 1992 case involving Planned Parenthood. For 10 points, what 1973 Supreme Court case extended right to privacy protections to abortion?
ANSWER: ***Roe*** *v. Wade* [or *Roe v.* ***Wade***; or *Wade v.* ***Roe***; or ***Wade*** *v. Roe*; or *Jane* ***Roe****, et al. v. Henry Wade, District Attorney of Dallas County*; or *Henry* ***Wade****, District Attorney of Dallas County v. Jane Roe, et al.*]

 **VHSL Regular Season 2016-2017 - Round 24 - Tiebreaker Questions**

1. A ring in Manitowoc (MAN-uh-TOE-wock), Wisconsin commemorates where the fourth spacecraft of this name crashed in 1962. Plants and two dogs named Belka and Strelka were on the fifth spacecraft of this name. Laika, another dog, tragically died during the flight of the second vehicle of this name. The launch of the first vehicle of this name started the Space Race. For 10 points, give this name of the Russian-created, first artificial satellite sent into space.
ANSWER: **Sputnik** [or Korabl-**Sputnik**]

2. This country exchanged two million people with its eastern neighbor after signing the Treaty of Lausanne (LAH-sann). This country's nationalist movement is fueled by the Megali Idea. It stopped an Italian invasion in 1941 but later fell to the Germans during the rule of Ioannis (EYE-oh-ANN-us) Metaxas. A 1974 Turkish invasion prevented this country from gaining Cyprus. For 10 points, name this country that was once ruled by a military junta from Athens.
ANSWER: **Greece** [or **Hellenic Republic**; or **Hellas**]

3. This artist painted two depictions of Maria Cayetana (KY-uh-tah-nuh) de Silva, *The Black Duchess* and *The White Duchess*. This artist painted the family of his royal patron, Charles IV. A painting by this man set during the Peninsular War depicts a man in a white shirt holding his hands in the air as a Napoleonic firing squad aims their guns at him. For 10 points, name this man who painted *The Third of May 1808*.
ANSWER: Francisco **Goya** [or Francisco José de **Goya** y Lucientes]

4. The Skidmore, Owings & Merrill-designed NBC Tower can be found in this city's Magnificent Mile. Ludwig Mies van der Rohe designed several apartment buildings along this city's Lake Shore Drive. This city's tallest building is made of nine square "tubes" of different heights, features three protruding "skydecks" with glass floors, and was once named after Sears. For 10 points, name this "Windy City" home to the Willis Tower.
ANSWER: **Chicago**, Illinois

5. A character created by this playwright recalls the suicide of her homosexual husband Allan Grey. Jim O'Connor breaks the horn off of a unicorn figurine belonging to Laura Wingfield in another play by this man. The line, "I have always depended on the kindness of strangers," is spoken by Blanche DuBois in his play about the Kowalskis. For 10 points, name this American playwright of *The Glass Menagerie* and *A Streetcar Named Desire.*
ANSWER: Tennessee **Williams**

What is the inverse tangent of zero degrees?
ANSWER: **0**

What Dutch artist frequently used red, yellow and blue in paintings like *Broadway Boogie-Woogie*?
ANSWER: Piet **Mondrian** [or Pieter **Cornelis Mondriaan**]