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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 21****First Period, Fifteen Tossups** |

1. Neighborhoods on this island include Tompkinsville, New Dorp, and Tottenville, which is the southern terminus of its namesake railway. Fares were eliminated on its namesake ferry in 1997. This island, coterminous with the County of Richmond, is connected to Bay Ridge via the Verrazano-Narrows Bridge and is home to what was once the largest landfill in the world. For 10 points, Fresh Kills is found in this suburban, southernmost borough of New York City.

ANSWER: **Staten Island**

2. John Darley and Bibb Latane studied this phenomenon by pumping smoke into a room while participants filled out questionnaires. A reported thirty-eight people fell victim to this effect when they witnessed Winton Moseley's murder of Kitty Genovese, but nobody attempted to help.For 10 points, name this psychological effect in which people are less likely to address a situation as the size of the group increases.

ANSWER: **bystander effect** [or **Kitty Genovese effect** until "Kitty Genovese" is read]

3. In 2014, a university in this city re-hired Bobby Petrino as the coach of its football team, after previous coach Charlie Strong left for Texas. The Muhammad Ali Center is in this city, as is his childhood home. This city is home to a university that won the 2013 NCAA men’s basketball championship, nicknamed the Cardinals. For 10 points, name this city whose Churchill Downs annually hosts the Kentucky Derby.

ANSWER: **Louisville**, Kentucky

4. The destruction wreaked by this man's army was described in hymns by Sikh leader Guru Nanak, whose successors would be persecuted by the dynasty this man founded. This ruler of Ferghana took Kabul from the Arghums and promoted the Chagatai language of his ancestor, Tamerlane. He used combined gunpowder and elephant troops to defeat Ibrahim Lodi at First Panipat, founding a dynasty that ruled India until 1857. For 10 points, name this founder of the Mughal Empire.

ANSWER: **Babur**

5. The "haskalah" or Jewish Enlightenment movement arose from this present-day country. A theologian from this present-day country wrote the book *Church Dogmatics* and authored the Barmen Declaration, in which Confessing Church protested the use of religion by an oppressive government here. This country's mostly Protestant north and mostly Catholic south erupted into the Thirty Years War in 1618. For 10 points, name this country, the native land of a Pope who retired in 2013, Joseph Ratzinger.

ANSWER: **Germany**

6. The giant Thiazi coerced this god into aiding with the kidnapping of Idunn. A section of the Poetic Edda named for this god shows him accusing the other gods of immorality at Aegir’s feast. This god is condemned to eternally languish under a serpent’s dripping poison, a punishment for convincing Hodr to kill his brother Baldur. With the giantess Angrboda, this god was the father of the Midgard Serpent and Fenrir. For 10 points, name this Norse trickster god.

ANSWER: **Loki**

7. After this event, the Roberts Commission recommended the dismissal of Walter Short and Hub Kimmel. The complete surprise achieved by one side in this event was signified by the code words “Tora! Tora! Tora!” This event resulted in the complete destruction of the USS *Arizona*. For 10 points, name this event denounced as a “day that will live in infamy” by Franklin Roosevelt, a Japanese sneak attack on a Hawaiian base on December 7, 1941.

ANSWER: **Pearl Harbor** attack

8. The artist of this painting conducted studies at the Hospital Beaujon to properly depict the corpses shown in it. The subjects of this painting are arranged in a pyramid and lie in front of a billowing sail. In the top right of this painting, a man rises and waves a red piece of cloth, attempting to gain the attention of a passing boat. For 10 points, name this Theodore Gericault painting that depicts sailors after a shipwreck.

ANSWER: *The* ***Raft of the Medusa*** [or *Le* ***Radeau de la Meduse***]

9. The Theophylact family held power for decades in this city through a concubine named Marozia, a period dubbed “the Pornocracy.” The Colonnas and Orsinis vied for power in this city, where the corpse of Formosus was put on trial during the Cadaver Synod. A ruler of this city feuded with Philip IV of France and tried to place the entire world subordinate to him in the bull Unam Sanctum. The Lateran Treaty created a religious enclave in this city. For 10 points, name this city led by Boniface VIII and Julius II, the seat of the Papacy and capital of Italy.

ANSWER: **Rome**

10. A character in this novel alludes to his unrequited love by singing, “Ah! Si tu savais!” This novel features the pianist Mademoiselle Reisz and the flirtatious Alcee Arobin. Its protagonist, the wife of Leonce, falls in love with Robert Lebrun while staying at Grande Isle, near New Orleans. For 10 points, name this novel in which Edna Pontellier realizes her independence, by Kate Chopin.

ANSWER: *The* ***Awakening***

11. Aldosterone from the adrenal gland increases water reabsorption in this organ. The functional unit of this organ secretes renin from its juxtamedullary apparatus and is composed in part by the glomerulus, a network of capillaries surrounded by Bowman's capsule. That functional unit of this organ is the nephron and it is partially replaced by dialysis when it begins to fail. For 10 points, identify this set of bean-shaped organs that is responsible for blood filtration and urine production.

ANSWER: **kidney**s

12. A theory due to this person was so rabidly advocated by T.H. Huxley, including in a debate with Samuel Wilberforce, that Huxley became known as his "bulldog". This person's correspondence with Alfred Wallace influenced his decision to publish his most famous theory. The bedrock for his most famous theory was a trip aboard the *Beagle*, during which he observed the beaks of Galápagos finches. For 10 points, name this author of *On the Origin of Species*, which contained his theory of evolution by natural selection.

ANSWER: Charles **Darwin**

13. The number of these objects necessary to span a space is called that space's dimension. A collection of these objects can be orthogonalized using the Gram-Schmidt process, and ones that scale by a constant value when multiplied by a matrix are given the prefix "eigen–". Their components are often written as a one-dimensional column or row of numbers. For 10 points, name these mathematical objects with both a magnitude and a direction.

ANSWER: **vector**s

14. In this novel, the word “Resurgam” is written on a gravestone for Helen Burns, who is a student at Lowood along with the title character. A woman in this novel named Bertha Mason gets locked up in her husband’s attic after she goes insane. After rejecting a proposal from the missionary St. John Rivers, this novel’s protagonist returns to the blind Edward Rochester. For 10 points, name this novel by Charlotte Brontë.

ANSWER: ***Jane Eyre***

15. To function, these devices require a resonant cavity that can support standing waves for certain modes. These devices also require a gain medium in which more particles can be present in an excited state than the ground state, a situation called population inversion. These devices emit coherent light due to stimulated emission of photons, resulting in a single wavelength of emitted light. For 10 points, name these devices used in CD players and some namesake pointers.

ANSWER: **laser**s [or **light amplification by stimulated emission of radiation**]

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 21****Directed Round** |

1A. What object, named for a German mathematician, has only one side and can be created by attaching two ends of a strip of paper with a half-twist?

ANSWER: **Moebius strip** [or **Moebius band**]

1B. Name the actor who plays FBI agent Ryan Hardy on *The Following.*

ANSWER: Kevin **Bacon** [Kevin Norwood **Bacon**]

2A. What quantity, which represents the stiffness of a material, is defined as the ratio of stress to strain?

ANSWER: **Young's modulus** [or **elastic modulus**; or **tensile modulus**]

2B. What model insect was extensively studied by Thomas Hunt Morgan to discover the presence of sex-linked genes, such as gives rise to the white-eyed mutant?

ANSWER: ***Drosophila*** *melanogaster* [or ***D****rosophila* ***melanogaster***; or common **fruit fly**; or **vinegar fly**]

3A. This is a 20-second calculation question. Give, in slope-intercept form, the equation of the line parallel to the line 3*x* - *y* = 8 that passes through the point (1,-2).

ANSWER: ***y* = 3*x*-5**

3B. This is a 20-second calculation question. Kate randomly selects a number between 1 and 10 such that the chance of selecting every number is equal. What is the probability that the number she selects is divisible by 3?

ANSWER: **3/10** [or **0.3**; or **30%**]

4A. Name the Edith Wharton novel in which Bertha Dorset accuses Lily Bart of having an affair with her husband.

ANSWER: *The* ***House of Mirth***

4B. What provincial set of islands with a capital at Palma include Minorca and Majorca, and are found to the east of Spain?

ANSWER: **Balearic** Islands

5A. Simon de Montfort assembled the Mad Parliament during the reign of what English king, who ruled between John and Edward I?

ANSWER: **Henry III** of England [or **Henry of Winchester**]

5B. The French “pont” (PON) and Spanish “puente” (PWEN-tay) share an origin in the Latin “pons,” and both translate to what English word?

ANSWER: "**bridge**"

6A. What jazz vocalist, known as the "First Lady of Song," is known for her trademark scat singing?

ANSWER: Ella **Fitzgerald**

6B. What Greek disciple of Leucippus is best remembered as the father of atomic theory?

ANSWER: **Democritus**

7A. What conqueror of the Medians is credited with expanding the domain of the Achaemenid (uh-KYE-muh-nid) Dynasty into the original Persian Empire?

ANSWER: **Cyrus** the Great

7B. What type of bird does John Keats declare “wast not born for death” in a famous ode?

ANSWER: a **nightingale**

8A. This is a 30-second calculation question. A simple "house" figure is made by drawing an isosceles triangle on top of a square. If the height of both the triangle and the square is 2 units, what is the perimeter of the house drawing? Express your answer in simplest radical form.

ANSWER: **6 + 2 root 5** [or **6 plus 2** times the square **root** of **5**; or **6 plus 2** times **rad**ical **5**]

8B. This is a 30-second calculation question. The cosine of a certain third-quadrant angle is negative one-third. What is the cosine of half that angle?

ANSWER: **negative 1 over** square **root** of **3** [or **negative 1 over rad**ical **3**; or **negative** square **root** of **3 over 3**; or **negative rad**ical **3 over 3**]

9A. What literary term identifies instances of a part being substituted for a whole or a whole being substituted for a part?

ANSWER: **synecdoche**

9B. What German poet of *Atta Troll* wrote about a beautiful woman who causes sailors to crash into the rocks of the Rhine in the poem “Die Lorelei”?

ANSWER: Heinrich **Heine**

10A. In what country are Abdullah Abdullah and Ashraf Ghani running against each other to succeed outgoing president Hamid Karzai?

ANSWER: Islamic Republic of **Afghanistan**

10B. Name the university where the Ohio National Guard killed four and injured nine protesting students on May 4, 1970?

ANSWER: **Kent State** University

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 21****Third Period, Fifteen Tossups** |

1. Many of these instruments were built by Auguste Cavaille-Coll. Liszt composed a "fantasy and fugue" based on a Meyerbeer opera for this instrument. Bach walked hundreds of miles to hear Dietrich Buxtehude play this instrument, prominent in Camille Saint-Saens’s third and final symphony. A well-known piece for this instrument, which features a pedalboard and manuals, is J. S. Bach's *Toccata and Fugue in D Minor* for it. For 10 points, name this wind-powered keyboard instrument common in church music.

ANSWER: pipe **organ**

2. This play’s protagonist asks, “Was this the face that launched a thousand ships?” in a famous speech addressed to Helen of Troy. This play’s title character also summons the ghosts of Alexander the Great and his paramour after acquiring supernatural powers by making a pact with Mephistophilis. For 10 points, name this tragedy by Christopher Marlowe about a man who sells his soul to the devil.

ANSWER: ***Doctor Faustus*** [or *The Tragical History of* ***Doctor Faustus***]

3. During one point in this controversy, lawyer Ferdinand Labori was shot in the back by a supporter of Edouard Drumont and the paper The Free Word. An open letter to Felix Faure over this scandal appeared on the front page of *L'Aurore*. The namesake of this scandal spent five years at Devil's Island despite the obvious guilt of Ferdinand Esterhazy. For 10 points, name this 1890s scandal that inspired Zola's “J'accuse,” in which a Jewish French officer was wrongly accused of spying for Germany.

ANSWER: The **Dreyfus** Affair

4. A 2008 film set in this country is about a cellist who takes up a job as a mortician. This setting of *Departures* is also the setting of a film in which an old couple visits their children in the title city, only to discover that they are too busy with their new lives. *The Magnificent Seven* was a Western adaptation of a different film from this country, in which four members of the title group of warriors die while defending a farming village from bandits. For 10 points, name this setting of *Seven Samurai* and *Tokyo Story.*

ANSWER: **Japan** [or **Nippon**]

5. This man killed a stag sacred to Artemis and caused the winds to stop. Heinrich Schliemann discovered a mask that Schliemann claimed belonged to this man. He angered Apollo by refusing to return Chryses to her father, and he also angered his wife by sacrificing their daughter Iphigenia. This man brought Cassandra back to Mycenae and was killed by Clytemnestra. For 10 points, name this chief commander of the Greek army during the Trojan War.

ANSWER: **Agamemnon**

6. This equation's namesake discovered the Third Law of Thermodynamics. This equation can be generalized to multiple ions in order to give the potential across a cell membrane. This equation can be derived from the expression for non-standard Gibbs free energy, then dividing by Faraday's constant. The natural log of the reaction quotient gives the concentration dependence of cell potential in this equation. For 10 points, name this equation from electrochemistry.

ANSWER: **Nernst** equation

7. The State Committee on the State of Emergency led a failed coup against this leader in 1991. This politician created the Congress of Peoples’ Deputies, which led to the first free elections in his country in seventy-two years. This man criticized the Strategic Defense Initiative at the Reykjavik Summit. This man’s policies of glasnost and perestroika helped him win the 1990 Nobel Peace Prize. For 10 points, name this man, the final leader of the Soviet Union.

ANSWER: Mikhail **Gorbachev** [Mikhail Sergeyevich **Gorbachev**]

8. In *Mr. Smith Goes to Washington,* Smith is appointed Senator due to this action having an extremely unusual outcome. Edgar cheats at this action to win the throne from Sabin in *Final Fantasy VI.* In *No Country For Old Men,* a gas station clerk is asked about “the most he's ever lost” over this action by hitman Anton Chigurh. For 10 points, name this method of randomly making a choice using an item such as a quarter.

ANSWER: **coin flip** [or equivalents]

9. A ten-year effort by this scientist to understand the orbit of Mars produced *Astronomia nova*. A supporter of strict heliocentrism, this person's work diverged from earlier astronomers in not being based on epicycles. He names the supernova observed in 1604 as he tracked it for an entire year. As this person was an assistant to Tycho Brahe, he used Tycho's data to determine that the orbit of a planet is an ellipse with the Sun at one of its foci. For 10 points, name this astronomer who developed three laws of planetary motion.

ANSWER: Johannes **Kepler**

10. A commander in this novel uses cloth and straw dummies to recycle the arrows of his enemy. In this novel, Guan Yu, and Zhang Fei swear an oath with another character in a peach garden to protect their people from the Yellow Turban revolt. That character, Liu Bei, unites with Sun Quan to defeat Cao Cao at the Battle of Red Cliffs. For 10 points, name this Luo Guanzhong historical novel, one of the Four Great Classical Novels.

ANSWER: ***Romance of the Three Kingdoms*** [or ***Sanguo yanyi***]

11. On September 6, this country commemorates a 1965 war with its eastern neighbor during Defence Day. This country’s largest province is Balochistan. The world’s second-tallest mountain, K2, is found on its border with China. The Indus River flows through this nation, entering the Arabian sea near its port of Karachi. For 10 points, name this majority Muslim country, formed out of a partition from its eastern neighbor India.

ANSWER: **Pakistan** [Islamic Republic of **Pakistan**]

12. In August 2014, this person asserted that "'don't do stupid stuff' is not an organizing principle." Earlier, this person had been criticized for claiming her family was "dead broke" in an interview promoting her memoir *Hard Choices*. She was succeeded in her most recent position by John Kerry. For 10 points, identify this former Secretary of State and First Lady who is speculated to run for President in 2016.

ANSWER: **H**illary **Clinton** [**H**illary Rodham **Clinton**] [prompt on **Clinton**]

13. The inbreeding coefficient is derived by comparing observed values to this theorem's expected values. If all of its assumptions are met, a group will reach its namesake proportions within one generation, and in this theorem's calculations the quantity "2pq" represents heterozygotes. For 10 points, name this principle which states that the frequencies of alleles within a population are constant between generations, which is its namesake equilibrium.

ANSWER: **Hardy-Weinberg** equilibrium [or **Hardy-Weinberg** principle; or **Hardy-Weinberg** theorem; or **Hardy-Weinberg** model; or **Hardy-Weinberg** law; prompt on **H-W**]

14. In a novel by this writer, the baby Rebecca June is accidentally drowned by Janice, whose husband has an affair with Ruth Leonard. This man wrote about Queenie, a bikini-clad girl who attracts the attention of Sammy, a clerk, in his story “A&P.” This author created a former high school basketball star named Harry Angstrom in a quartet of novels where he is described as “rich” at “at rest.” For 10 points, name this author of the *Rabbit* series.

ANSWER: John **Updike** [or John Hoyer **Updike**]

15. A law signed by this President was replaced by the Nonintercourse Act and was satirized as a turtle named “Ograbme.” His first Vice President was replaced by George Clinton after killing Alexander Hamilton on the Weehawken dueling grounds. This signer of the Embargo Act ordered the Lewis and Clark expedition to explore land purchased from France in 1803. For 10 points, name this President who authorized the Louisiana Purchase, America’s third.

ANSWER: Thomas **Jefferson**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 21****Tiebreaker/replacement questions** |

1. This letter is used for a class of baryons that contains an up quark, a down quark, and another quark. In a 1-dimensional scenario, this letter is used to represent linear charge density. This letter represents the radioactivity decay constant, such that the change in the number of particles equals this letter times the number of particles. A quantity represented by this letter is equal to the speed of a wave over its frequency. For 10 points, name this Greek letter used to symbolize wavelength.

ANSWER: **lambda**

2. In Hindu mythology, the demon Maricha turned into one of these animals to help abduct Sita. In Norse myth, four of these animals surrounded the world-tree Yggdrassil. For one of his labors, Heracles had to catch one of these animals from Keryneia that was sacred to Artemis. For 10 points, name this horned forest animal that is hunted in many myth systems.

ANSWER: **deer** [or **stag**s]

3. This author originally typed one of his novels onto a continuous, 120-foot scroll of paper. He included Dean Moriarty, a fictionalized version of Neal Cassady, in a novel detailing the adventures of Old Bull Lee, who represents William S. Burroughs, and Carlo Marx, who represents Allen Ginsberg. For 10 points, name this writer of the Beat Generation who wrote *On the Road.*

ANSWER: Jack **Kerouac**

4. This country's residents gained protection in the Crofting Act from an ongoing process of displacement known as the Highland Clearances. This country's disastrous attempt to colonize Panama in the Darien Scheme led to its bankruptcy and participation in the 1701 Act of Union, about a century after its indigenous Stuart Dynasty began a personal union with the English throne. For 10 points, name this country, the northern member of the United Kingdom.

ANSWER: **Scotland** [prompt on **UK** or **United Kingdom** until "Panama" is read; do not accept "England" or "Britain" or "Great Britain"]

5. The center of this country is dominated by the Zayandeh River, which flows into a swamp near its city of Isfahan. Its highest mountain, Mount Damavand, is found in the northern Alborz Mountains, and its western border is paralleled by the Zagros Mountains. Its northern coast is on the Caspian Sea. For 10 points, name this country west of Iraq, roughly the location of the historical Persia.

ANSWER: **Iran** [Islamic Republic of **Iran**] [or **Persia** until it is read]

What essay by Ralph Waldo Emerson promotes the title concept against conformity and tradition?
ANSWER: “**Self-Reliance**”

For what values of *x* does the expression e to the quantity *x* squared minus 6 *x* plus 5 equal 1?

ANSWER: *x* = **1** and *x* = **5** [accept answers in either order]