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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 13****First Period, Fifteen Tossups** |

1. This operation utilized a Belgian Shepherd Dog named Cairo, part of a force led by William McRaven. In July 2014, an Australian businessman released a tape in which Bill Clinton says that he could have performed the intended outcome of this operation. This operation, code-named Operation Neptune Spear, occurred in the city of Abbotabad. For 10 points, name this action that took place on May 2, 2011, the elimination of the head of al-Qaeda.

ANSWER: **killing of Osama bin Laden** [or obvious equivalents; or **Operation Neptune Spear** until it is read]

2. This author described a safecracker who falls in love with Annabel Adams and avoids being arrested by Ben Price. In another story by this author, Bill Driscoll is forced to bribe Ebenezer Dorset after kidnapping his son. Della sells her hair in order to buy a present for Jim in another of his stories, which takes place during the Christmas holiday. For 10 points, name this author of “A Retrieved Reformation,” “The Ransom of Red Chief,” and “The Gift of the Magi.”

ANSWER: O. **Henry** [or William Sydney **Porter**]

3. Bhigru cursed this god to not be worshiped on earth, which is why there is only one major temple dedicated to him. Four rishis known as the Kumaras sprang from the mind of this god, who emerged either from a golden egg or from his sacred lotus flower. This rider of Hamsa, the swan, is a consort of Saraswati. He earned his title in part by begetting Manu, the first man. For 10 points, name this member of the Hindu trimurti known as “the creator.”

ANSWER: **Brahma**

4. At thermal equilibrium, this quantity for a particle is three-halves times Boltzmann's constant times temperature. This quantity can be found by taking the square of linear momentum and dividing by twice the mass. The change in this quantity is equal to the work performed. It can be expressed as half the mass of an object times the square of velocity. For 10 points, name this "energy of motion".

ANSWER: **kinetic** energy [prompt on **energy**; do not accept "potential energy"]

5. The title “pandit” originally referred to scholars who had memorized major portions of these texts. One of these texts includes charms to protect against portentous pigeons and opens with hymns against diseases. The oldest of these texts describes its creation from the mouth of Purusha and opens with a hymn to Agni. That most famous of these texts was composed by sages called rishis and consists of ten mandalas. The Sama, Yajur, and Atharva are all examples of, for 10 points, what classic works of Hindu scripture whose most famous example is the Rig?

ANSWER: **Veda**s

6. In this novel, the Moor Zoraida secretly intends to convert to Christianity and escapes from her father. The title character of this novel promises to give control of an island to a man who rides the donkey Dapple. After reading many novels about knights, this book’s protagonist proclaims Dulcinea as his beloved woman and attacks windmills while accompanied by Sancho Panza. For 10 points, name this novel by Miguel de Cervantes.

ANSWER: ***Don Quixote*** [or *The* ***Ingenious Gentleman Don Quixote of La Mancha***; or *El* ***ingenioso hidalgo don Quijote de la Mancha***]

7. These compounds are often produced after the hydrolysis step in the Strecker synthesis. Dihedral angles of these compounds are typically visualized in Ramachandran plots. These compounds were produced from water, methane, ammonia, and hydrogen gas in the Miller-Urey experiment. tRNA transfers these compounds to ribosomes. They include a carboxylic acid and an amine group and their simplest example is glycine. For 10 points, name these "acids" which function as the general building blocks of all proteins.

ANSWER: **amino acid**s

8. This party was frustrated by its Trotskyist wing known as the Militant tendency. Two leaders of this party made an alleged power-sharing deal at the Granita restaurant in 1994. This party lost power under James Callaghan after trying to curb inflation during the Winter of Discontent in 1979, leading to a decade of rule by its major rival under Margaret Thatcher. For 10 points, name this British party led by Gordon Brown and Tony Blair, left-wing rivals of the Conservatives.

ANSWER: British **Labour** Party

9. Aluminum oxide reacts with water and this compound to make an aluminate salt in the Bayer process. The exothermic solvation of this compound explains why Drano heats up in water. Though it is not potash, slowly adding this compound to an acid through a buret would eventually cause phenolphthalein to turn pink. Its reaction with hydrochloric acid would produce water and table salt. For 10 points, name this common strong base which has formula NaOH.

ANSWER: **sodium hydroxide** [or **lye**; or **caustic soda**; or **NaOH** until it is read]

10. A character in this novel is repulsed after watching the pornographic film *Three Weeks in a Helicopter.* The Bokanovsky process is explained at the beginning of this novel. In this novel, a drug described as "Christianity without tears" is thrown out of a hospital window by a character who is later exiled along with Bernard Marx by the World Controller Mustapha Mond. For 10 points, name this novel about John the Savage's struggles in a dystopian society written by Aldous Huxley.

ANSWER: ***Brave New World***

11. This composer’s violin concerto uses a canzonetta as its second movement. Strings play pizzicato throughout the third movement of his fourth symphony, which was composed just before his unnumbered *Manfred* symphony. This composer commemorated the Battle of Borodino in a piece that pits the anthems "La Marseillaise" and "God Save the Tsar" against each other and climaxes with sixteen cannon shots. For 10 points, name this Russian composer of the *1812 Overture.*

ANSWER: Pyotr Ilyich **Tchaikovsky**

12. This man's army faced mutinies at Corkbush Field and Banbury and engaged in the Putney Debates. This man rose to power over Thomas Fairfax after winning the Battle of Naseby with a force created by the Self-Denying Ordinance. He was succeeded by his son Richard, known as Tumbledown Dick, after executing his rival following Pride's Purge. For 10 points, name this leader of the New Model Army who deposed Charles I and became Lord Protector of England.

ANSWER: Oliver **Cromwell**

13. This man’s assistant, Clarence Daily, was one of the first people to die from radiation poisoning. This man fought the so-called “War of the Currents” with George Westinghouse because this inventor promoted direct current power. In 1877, he tested an invention by reciting “Mary Had a Little Lamb.” For 10 points, name this man known as the “Wizard of Menlo Park,” the credited inventor of the phonograph and the first commercially practical electric light bulb.

ANSWER: Thomas Alva **Edison**

14. A number of endangered species live on this city’s namesake Peninsula, which is west of False Bay. Signal Hill and the Lion’s Head rise in this city, near a mountain named for its flatness, Table Mountain, together composing the City Bowl. It is its country’s second-most populous city, after Johannesburg. For 10 points, name this city on the southwest coast of South Africa, named for its proximity to a geographic feature “of Good Hope.”

ANSWER: **Cape Town** [or **Kaapstad**; or **iKapa**]

15. A "four-dimensional" variant of this game uses the W, A, S, and D keys to move objects between quadrants. Other variants of this game include a radioactive one with "decaying elements," and a "doge" (DOHJ) version which displays messages including "such matching." It is arguably broken by the "corner trick," unlike the game it is based on, "Threes." For 10 points, name this game where tiles are repeatedly combined with the goal of reaching the namesake number, two to the eleventh power.

ANSWER: **2048**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 13****Directed Round** |

1A. What Swiss mathematician put forward a namesake "rule" for solving systems of equations using matrices?

ANSWER: Gabriel **Cramer**

1B. What body advises the French government on language usage and publishes the official dictionary of the French language?

ANSWER: **Académie française** [or **French Academy**]

2A. How many stages are there in man's life, according to the “All the world’s a stage” monologue delivered by Jaques?

ANSWER: **seven**

2B. What 1868 event restored imperial rule to Japan and helped to modernize that country?

ANSWER: **Meiji** Restoration

3A. This is a 20-second calculation question. Four of the angles of a pentagon measure 100, 120, 140, and 160 degrees. What must be the measure of the fifth angle?

ANSWER: **20** degrees

3B. This is a 20-second calculation question. If events X and Y are mutually exclusive, the probability of X occurring is 0.4 and the probability of Y occurring is 0.5, then what is the probability that X or Y occurs?

ANSWER: **0.9** [or **9/10**; or **90 percent**]

4A. Identify the biblical figure whose near-sacrifice at the hands of his father forms the basis for Soren Kierkegaard's *Fear and Trembling.*

ANSWER: **Isaac**

4B. Which cellular organelle, whose inner membrane contains cardiolipin, has an inner matrix with folds called cristae?

ANSWER: **mitochondria** [or **mitochondrion**]

5A. What Hungarian created a multi-colored cube with pivoting sides that now bears his name?

ANSWER: Erno **Rubik**

5B. Which very-high-redshift active galactic nuclei is thought to be a compact region around a supermassive black hole that is driven by mass falling into the black hole from its accretion disc?

ANSWER: **quasar**s [or **quasi-stellar radio source**s]

6A. Name the Australian Prime Minister who has been criticized because of a large scholarship that his daughter received and for the Winkgate scandal.

ANSWER: Tony **Abbott** [Anthony John Abbott]

6B. What region was the site of Battle of Neerwinden in the French Revolutionary Wars, and along with Walloonia is one of the two major portions of modern Belgium?

ANSWER: **Flanders**

7A. What first federally funded road in United States history connected its namesake town in Maryland to Vandalia, Illinois?

ANSWER: **National Road** [or **Cumberland Road**]

7B. Identify the Rembrandt painting which depicts seven students observing the arm of Aris Kindt.

ANSWER: *The* ***Anatomy Lesson*** *of Dr. Nicolaes Tulp*

8A. This is a 30-second calculation question. An infinite geometric series converges if the absolute value of the ratio between consecutive terms is strictly less than 1. For what values of *z* does a series converge if the ratio between consecutive terms is 2*z* minus 7?

ANSWER: *z* **between 3 and 4**, exclusive [or *z* strictly **greater than 3 and less than 4**; do not accept answers including "inclusive"; do not accept answers including "or equal to"]

8B. This is a 30-second calculation question. Find *b* if the secant of *b x* equals the reciprocal of the expression "cosine *x*, to the fourth power minus sine *x*, to the fourth power."

ANSWER: **2**

9A. The Ainu people live on which northernmost of the four main Japanese islands, separated from its southern neighbor by the Tsuguru Strait?

ANSWER: **Hokkaido**

9B. What French poet, who authored “The Drunken Boat” and the collection *Illuminations*, is known for his love affair with fellow poet Paul Verlaine?

ANSWER: Arthur **Rimbaud**

10A. Along with ethos and logos, what method of appealing to emotion was identified by Aristotle as one of three modes of rhetorical persuasion?

ANSWER: **pathos**

10B. What Mark Twain novel focuses on the time traveler Hank Morgan?

ANSWER: *A* ***Connecticut Yankee in King Arthur’s Court***

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 13****Third Period, Fifteen Tossups** |

1. This market structure exists at a value of about 1800 on the Herfindahl–Hirschman index. In this market structure, the fact that price increases are taken but price decreases are not produces a "kink" in the demand curve. When prices are set in this market structure in a collusive fashion, a cartel emerges. For 10 points, identify this market structure in which there is more than one seller but only a small number of sellers with the power to affect the market as a whole.

ANSWER: **oligopoly**

2. The southwestern portion of this state escaped glaciation during the last Ice Age, and is known as the Driftless Area. It contains the Apostle Islands archipelago, and Neenah and Appleton are found along its Fox River Valley. Popular tourist attractions in this state include its namesake “Dells” and the Door Peninsula, which separates Green Bay from the rest of Lake Michigan. For 10 points, name this Midwestern state famous for its cheese, with capital at Madison.

ANSWER: **Wisconsin**

3. The motion of these objects can be determined by analyzing the torque produced by gravity and then using the small-angle approximation. The period of these objects is two-pi times the square root of length over g. One of these devices named for Foucault demonstrated the rotation of the earth. The double type exhibits chaotic motion, while normal ones can approximate simple harmonic motion. For 10 points, identify these devices consisting of a mass attached to a string.

ANSWER: **pendulum** [or **pendula**]

4. During this battle, Daniel Sickles lost his leg at the "Peach Orchard." The losing side's "high-water mark" was symbolized by Lewis Armistead pushing through at "the Angle." Joshua Lawrence Chamberlain made a dramatic defense of Little Round Top during this battle. At the end of this battle, a Cemetery Ridge was unsuccessfully assaulted during Pickett's Charge. For 10 points, name this three-day July 1863 Civil War battle, the bloodiest engagement in the war.

ANSWER: Battle of **Gettysburg**

5. This song was the first to be covered with classroom instruments by Jimmy Fallon and The Roots. In its music video, the singer spies on her neighbour while he mows his lawn. This song includes the line “I beg and borrow and steal, have foresight and it’s real.” This song’s performer laments that “before you came into my life, I missed you so bad” before singing about “all the other boys” who “try to chase” her. For 10 points, name this song by Carly Rae Jepsen.

ANSWER: “**Call Me Maybe**”

6. This author described a totalitarian state in America in *It Can’t Happen Here.* Paul Reisling is best friends with the title character of a novel by this man, set in the town of Zenith. Another of his novels begins as Carol Kennicott moves from Saint Paul to Gopher Prairie, Minnesota. This man was the first American author to win the Nobel Prize in Literature. For 10 points, name this author of *Babbitt* and *Main Street.*

ANSWER: Sinclair **Lewis** [or Harry Sinclair **Lewis**]

7. According to a variant of myth, this god was given immortality by Chiron, who forfeited his own after being shot by Heracles’ poisonous arrow. This god tricked Zeus into choosing the less appetizing portion of an animal sacrifice. This man warned Zeus about marrying Thetis. He was bound to Mount Caucasus and had his liver eaten out by an eagle for giving fire to the humans. For 10 points, name this brother of Epimetheus who aided the Olympians during Titanomachy.

ANSWER: **Prometheus**

8. A companion of this man did not join him after falling from his horse and taking it as a bad omen.This man became a Christian while serving King Olaf I. This man built some settlements known as his "Booths," one of which may be located at L'Anse aux Meadows. This son of Eric the Red visited a place that he called Vinland because of its grapes. For 10 points, name this Viking explorer who sailed to Newfoundland.

ANSWER: **Leif** Ericson [or **Leif** the Lucky; or **Leifur** Eiriksson; prompt on **Ericson**]

9. This painter depicted Bertrand Gardel losing a match to George Holmes in a genre painting he made for his father. This artist depicted a man with a moustache looking over his right shoulder while rowing the title boat. This painter of *The Chess Players* and *Max Schmitt in a Single Scull* created another painting in which the title professor is giving an anatomy lesson at Jefferson Medical College. For 10 points, name this painter of *The Gross Clinic*.

ANSWER: Thomas **Eakins** [or Thomas Cowperthwait **Eakins**]

10. In this country, partygoers in the Barrios Altos neighborhood were killed by the Grupo Colina death squad. A leader of this country dissolved its Congress after winning an election against a winner of the Nobel Prize in Literature. This country had a long conflict with the Shining Path guerrillas. This country’s former president Alberto Fujimori was sentenced to prison, and his daughter was defeated in a race for the presidency by Ollanta Humala. For 10 points, name this Latin American country whose capital is Lima.

ANSWER: **Peru**

11. The zeta function of negative one equals negative one over this number, so in some sense, its negative reciprocal equals one plus two plus three, all the way to infinity. This is the third pentagonal number. An icosahedron has this many vertices. Starting with 1-factorial, this number is the product of the first three factorials, and it is denoted by C in hexadecimal. For 10 points, identify this number of faces of a dodecagon and edges of a cube.

ANSWER: **12**

12. Charles C. Ebbets might have taken the photo showing this action, in which a man lights up a smoke for his neighbor to the left. The same men who perform this action are depicted napping in another photo from the same shoot. The photograph depicting this action was taken in 1932, during the construction of the RCA building. For 10 points, identify this dangerous action performed by workers on a girder with their feet dangling 256 meters above ground in an iconic photo.

ANSWER: workers eating **lunch** on a skyscraper [or **taking a break**; the name of the photograph is ***Lunch atop a skyscraper*** *(New York Construction Workers* ***Lunch****ing on a Crossbeam)*; prompt on **sit**ting]

13. The discovery of this organelle was accomplished using silver chromate in what its founder called the "black reaction." Protection against apoptosis is provided by this organelle's GAAP protein. Vesicles coated with the COPI (cop-one) protein leave this organelle's cis end and head to the endoplasmic reticulum. They are made up of folded stacks called cisternae. For 10 points, name this organelle that packages and delivers proteins, named for an Italian scientist.

ANSWER: **Golgi** apparatus [or **Golgi** body; or **Golgi** complex]

14. This poet pilloried his rival Colley Cibber as king of the dunces in his long poem *The Dunciad.* He coined the saying, “A little learning is a dangerous thing,” in his poem *An Essay on Criticism.* In another of his poems, the Baron uses his scissors to cut the title strand of hair from Belinda’s head. For 10 points, name this English poet who wrote the mock-epic *The Rape of the Lock.*

ANSWER: Alexander **Pope**

15. The motion of the equinoxes along the ecliptic is due to changes in this thing. Lunar tidal forces contribute to the wobble of this thing known as nutation. According to the Milankovitch cycles, a period of 41,000 years and 26,000 years characterizes cyclical changes in the precession and tilt of this thing. The tilt of this thing is responsible for the Earth's seasons and its intersection with the Earth defines the geographic North and South Poles. For 10 points, name this invisible line about which the Earth rotates.

ANSWER: Earth's rotational **axis**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 13****Tiebreaker/replacement questions** |

1. A pioneering group of this denomination included Margaret Fell and James Nayler and was called the Valiant Sixty. Members of this denomination believe that an “inner light” exists in people. George Fox founded this religious group, which is highly committed to pacifism and modesty. For 10 points, name this Christian denomination, also known as the Religious Society of Friends, whose adherents included William Penn.

ANSWER: **Quaker**s [or Religious Society of **Friends** until “Friends” is read]

2. At the end of this novel, the protagonist becomes disgusted with human beings and only talks to horses, who remind him of the noble Houyhnhnms (HWIN-ims). On his second voyage, the title character of this novel encounters the giant Brobdingnagians, and on his first, he is made the prisoner of the six-inch-tall Lilliputians. For 10 points, name this satire written by Jonathan Swift.

ANSWER: ***Gulliver’s Travels***

3. In 2005, a landmass called the Warming Island appeared off the east coast of this island. The scientific station Summit Camp is found near the center of this island, whose northern part is called Peary Land. In its native tongue, this island is called Kalaallit Nunaat. With its capital at Nuuk, this Danish-owned island was given its now-misleading name by Erik the Red to entice potential settlers. For 10 points, name this large island east of Canada mostly covered by glaciers.

ANSWER: **Greenland** [or **Kalaallit Nunaat** until it is read]

4. The increasing economic value of these animals led to the enclosure movement and to a profitable raw materials export from England to Flanders. A product of these animals was "carded" in Florence by people who launched the Ciompi (chee-OHM-pee) Revolt. These animals' stomachs are the traditional container for a dish eaten on Burns Night, the haggis. For 10 points, name these grazing animals that provide mutton and wool.

ANSWER: **sheep**

5. An extremely toxic gas composed of this element and three elements of hydrogen smells like rotten fish. In moles, this is the least common element which is found naturally in DNA. This element forms common red and white allotropes. This element forms four bonds to oxygen in a minus-three polyatomic ion found in ATP. For 10 points, name this element located right below nitrogen on the Periodic Table which has symbol P.

ANSWER: **phosphorus** [or **P** until it is read]

What December 1890 massacre in South Dakota featured at least 150 Lakota killed by the 7th U.S. Cavalry?

ANSWER: **Wounded Knee** Massacre

If you draw two cards from a standard deck of 52 cards with replacement, what is the probability that neither one of them is a spade?

ANSWER: **9/16** [or **1521/2704**]