THE LONG ISLAND QUIZ BOWL ALLIANCE

VHSL Super-Regionals Sample

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Period 1

1. The conservation of this quantity arises from U(1) ("U-one") gauge symmetry in QED ("Q-E-D"). This quantity divided by the permittivity of free space gives the electric flux through an enclosed surface per Gauss's law. The quantization of this property was demonstrated by Millikan's oil-drop experiment. The rate of change of this quantity over time gives current. What quantity measured in coulombs is positive for protons and negative for electrons?
ANSWER: electric **charge** <Science>

2. In a play by an author from this modern-day country, the village chief is favored over a schoolteacher who refuses to pay a bride-price to Sidi ("SEE-dee"). Another author from this country was sampled by Beyoncé and discussed the necessity of a shift in culture in her TED talk "We Should All be Feminists." The play *The Lion and the Jewel* is set in what African country, the birthplace of Wole ("WOH-lay") Soyinka and Chimamanda Ngozi Adichie ("chim-uh-MAN-dah ung-OH-zee ah-DEE-chee")?
ANSWER: **Nigeria** [or Federal Republic of **Nigeria**] <Literature>

3. In a 2017 movie, this actor pulls out another pair of sunglasses every time his are taken by a bank robber. In that movie, this actor is part of an awkward elevator ride with Kevin Spacey's character and a couple displaying PDA. This actor plays a terminally ill character who travels to Amsterdam with Hazel Grace Lancaster in a movie adaptation of a John Green book. What actor played Augustus Waters in *The Fault in Our Stars* and the title character in *Baby Driver*?
ANSWER: Ansel **Elgort** <Pop Culture>

4. During the "Little Bohemia" Raid, this man assigned Special Agent Samuel A. Cowley to prosecute John Dilinger. This man directed the COINTELPRO ("co-intel-pro") initiative to identify and track suspected officials of the Communist Party. This man, who had a longtime secret relationship with Clyde Tolson, investigated Bruno Hauptmann in New Jersey after the Lindbergh Baby kidnapping. Name this longest-serving FBI director.
ANSWER: J. Edgar **Hoover** [or John Edgar **Hoover**] <History>

5. Trios of these figures named for Malfatti are never space-optimizing. Pairs of these figures named for Frederick Soddy can be viewed as a case of Descartes' theorem concerning examples of them that touch at one point. A "nine-point" one of these shapes has one-fourth the area as one that passes through all three vertices of a triangle. Triangles can be contained in the "circum-" type of what shapes whose area is r squared times pi?
ANSWER: **circle**s [accept Malfatti **circle**s, Soddy **circle**s, nine-point **circle**s, or circum**circle**s] <Science>

6. This color names a book in 240 numbered paragraphs by Maggie Nelson. It isn't white, but the protagonist of one novel is envious of Maureen Peal and Shirley Temple having features of this color. In a "spiteful" house with an address containing this color, Sethe ("SETH-uh") kills her daughter to prevent her from becoming enslaved. Pecola Breedlove desires eyes of what color in a Toni Morrison novel?
ANSWER: **blue** [accept ***Bluets*** or *The* ***Bluest*** *Eye* or *124* ***Bluestone*** *Road*] <Literature>

7. This state's Sangre de Cristo mountain range is home to the tallest sand dunes in the U.S. The Painted Wall, this state's tallest cliff, is in Black Canyon of the Gunnison National Park. The Cliff Palace in this state's Mesa Verde National Park was created by the ancestral Puebloans and is near its New Mexico border. What state home to Pikes Peak and Mount Elbert is led from "The Mile High City," Denver?
ANSWER: **Colorado** [or **CO**] <Geography>

8. Alvars primarily occur on expanses where this rock predominantly composes the bedrock. *Archaeopteryx* ("ARR-kay-OPP-turr-icks") feathers have been preserved in a formation of this rock, the Solnhofen. Varieties of this rock include tufa and travertine. Karst topography typically forms from the dissolution of dolostone or this rock, the most common constituent of stalagmites and stalactites. Marble is usually produced by metamorphosis of what sedimentary rock that is composed mostly of calcium carbonate?
ANSWER: **limestone** [prompt on calcium carbonate or CaCO3] <Science>

9. Anasazi cliff dwellings inspired this architect's maze-like design of the Mesa Laboratory in Colorado. This architect used the Ibn Tulun Mosque as an inspiration for his Museum of Islamic Art in Doha. High winds in Boston caused windows to fall off of this architect's John Hancock Tower. This architect designed the building in Cleveland that houses the Rock and Roll Hall of Fame. The glass pyramid at the Louvre was designed by what Chinese-American architect?
ANSWER: I.M. **Pei** [or Ieoh Ming **Pei**] <Fine Arts>

10. This quantity was first discussed by Simon Kuznets in a report to Congress that warned against using it to measure welfare. An increase by 1% in unemployment will drop this quantity by 2%, according to Okun's Law. On an Aggregate Demand-Aggregate Supply graph, this quantity is plotted against price level. What quantity measures the value of all goods and services produced by a country during a period of time?
ANSWER: **Gross Domestic Product** [or **GDP**; accept specific types, such as Real **GDP** or Nominal **GDP**] <Social Science>

11. This author wrote about the "vapors that weep their burthen to the ground" in his dramatic monologue "Tithonus" ("tih-THOH-nuss"). The line "Sunset and evening star" begins a poem by this man that states "I hope to see my Pilot face to face." In addition to "Crossing the Bar," this poet wrote "Half a league, half a league" to begin a poem about a cavalry charge during the Crimean War. Name this poet of "The Charge of the Light Brigade."
ANSWER: Alfred, Lord **Tennyson** <Literature>

12. Some of these animals produce a hypoxanthine ("hypo-ZAN-theen")-based chemical called *schreckstoff*, or "fright substance." Today, most of these animals are teleosts ("TEE-lee-osts") in the class Actinopterygii ("ack-TEE-noh-ter-RIDGE-ee-EYE"). These animals often have a sensory "lateral line organ," whisker-like "barbels," and "rakers" attached to branchial arches. "Bony" examples of these animals have a buoyancy-modulating sac called a "swim bladder." What animals include the marlin and the minnow?
ANSWER: **fish** [accept specific fish, such as **catfish**; prompt on sharks] <Science>

13. Oral tradition claims that this person was married to Kocoum ("koh-koom"), who was one of this person's father's bodyguards. After being captured by Samuel Argall, this person spent over a year imprisoned at Jamestown before dying in the English city of Gravesend. Before marrying John Rolfe, this person adopted the name "Rebecca." In the village of Werowocomoco ("WAIR-uh-woh-KOH-muh-koh"), what Native American woman legendarily saved the life of John Smith?
ANSWER: **Pocahontas** <History>

14. During this period, daybreak is defined as the time when a person can distinguish between a black and white thread. During this holiday, it is optional to go into a ten-day period of seclusion called *itikaf*. During this holiday, the *Fajr* ("FUH-jur") prayer is said after *suhoor*, a meal eaten before dawn. This period ends with the celebration of Eid al-Fitr ("EED al-FIT-er") with a large feast. Name this month-long holiday during which Muslims fast from dawn until dusk.
ANSWER: **Ramadan** [accept **Ramazan**, **Ramzan**, or **Ramathan**] <Religion>

15. In biology, this prefix starts a word for the system of plants in which there are male *and* female sex organs on the same plant. This prefix begins the name of functions that are uniformly increasing or uniformly decreasing. This prefix for a type of nucleosis called "kissing disease" begins the word for a glass circle that stereotypical rich people might wear in their eye. This prefix names the market structure in which a firm has no competition. What Greek prefix means "one"?
ANSWER: **mono-** [accept **mono**ecious or **mono**ecy or **mono**tonic functions or **mono**nucleosis or **mono**cle or **mono**poly] <Vocabulary>

Period 2 (Directed Questions)

1A. In this state, Skookum Jim became rich after reaching Rabbit Creek. Balto was hailed as a hero during a Serum Run in what state, which was the site of the disastrous *Exxon Valdez* oil spill in 1989?
ANSWER: **Alaska** <History>

1B. In this country, Damnoen Saduak is an example of a "floating market" where vendors sell goods on boats. The Chao Phraya River flows through what Asian country whose islands include Phuket ("poo-KET")?
ANSWER: **Thailand** [accept Kingdom of **Thailand**] <Geography>

2A. A recently-coined term for the "Peak Extinction" of these things is set to occur in 2041. Isostatic rebound is caused by the disappearance of what things, which can occur when ablation outspeeds accumulation of snow?
ANSWER: **glacier**s [or **glacial ice**; accept **ice sheet**s; prompt on ice] <Science>

2B. This man replaced a platinum electrode with a carbon one for his improvement of the Grove cell. What German discoverer of caesium ("SEEZ-ium") and rubidium names a common lab source of an open flame?
ANSWER: Robert **Bunsen** [accept **Bunsen** cell or **Bunsen** burner] <Science>

3A. Pencil and paper ready. This is a 20-second calculation question. What do you get by adding together all of the largest interior diagonals of a cube with a volume of 125 cubic units?
ANSWER: **$20\sqrt{3}$** ("twenty root three" or "twenty times the square root of three") <Computational Math>

3B. Pencil and paper ready. This is a 20-second calculation question. A sphere has a volume of 256 pi over 3. What is the volume of the smallest cube that exactly fits around the sphere?
ANSWER: **512** cubic units <Computational Math>

4A. This emperor constructed a pontoon bridge across the Bay of Baiae ("bye-aye"). After a supposed victory over the sea, this emperor ordered troops to collect seashells as "spoils of war." What Roman emperor was nicknamed "Little Boots"?
ANSWER: **Caligula** [or **Gaius** Caesar Augustus Germanicus] <History>

4B. During this war, John Talbot was killed at the Battle of Castillon. The signing of the Treaty of Troyes occurred during what what, which included a battle at which Charles d'Albret ("doll-BRAY") died and the longbow was heavily utilized?
ANSWER: **Hundred Years'** War <History>

5A. This director voiced a ghost-hating blue Kronan made of rocks named Korg in a Marvel film starring Chris Hemsworth. *Thor: Ragnarok* was directed by what New Zealander?
ANSWER: Taika **Waititi** <Pop Culture>

5B. This politician was succeeded in the House of Representatives by Sydney Kamlager-Dove. This woman launched the Inside Safe program to give her city's homeless population residence inside hotels. Name this current mayor of Los Angeles.
ANSWER: Karen **Bass** [or Karen Ruth **Bass**] <Current Events>

6A. In a story by this author, a character only referred to as "The American" uses various euphemisms for abortion. What author, who was an ambulance driver during World War I, wrote the story "Hills Like White Elephants"?
ANSWER: Ernest **Hemingway** <Literature>

6B. In this play, after arguing with his debtors about the gender of nouns, Strepsiades ("strep-SIGH-uh-deez") refuses to pay his debts. What 423 BC comedy, in which Pheidippides ("fye-DIP-puh-deez") is enrolled at The Thinkery to learn debating, was written by Aristophanes ("ah-riss-TAH-fuh-neez")?
ANSWER: *The* ***Clouds*** [or ***Nephelai***] <Literature>

7A. Pencil and paper ready. This is a 30-second calculation question. Given triangle ABC with BC = 6 ("BC equals six"), AC = 4 ("AC equals four") and Angle C = 60 degrees, what is the length of side AB?
ANSWER: **2√7** ("two root seven" or "two times square root of seven") <Computational Math>

7B. Pencil and paper ready. This is a 30-second calculation question. In a right triangle, the cosecant of an angle is equal to 1.25. What is the exact value of the co•tangent squared of the triangle's other non-right angle?
ANSWER: **16/9** <Computational Math>

8A. This organ secretes digestive fluid including trypsinogen (trip-SIN-uh-jin) into the duodenum ("dew-AH-duh-num"). What organ contains the islets ("EYE-lets") of Langerhans?
ANSWER: **pancreas** <Science>

8B. When bonded to nitrogen, this element forms a wurtzite compound that is 18% stronger than diamond. A silicate of what lightest metalloid is present in Pyrex glass?
ANSWER: **boron** [or **B**] <Science>

9A. As a diacritic, this punctuation is called a "circumflex." What symbol, whose name means "there is lacking," is used by proofreaders to indicate that a mark or word should be inserted into text?
ANSWER: **caret** [prompt on power mark] <Grammar>

9B. This is the last word in the title of a Robert Nozick book that introduced the utility monster. What word, derived from Ancient Greek for "nowhere," names an island on which people hold no private property in a Thomas More book?
ANSWER: **utopia** [accept ***Utopia*** or *Anarchy, State, and* ***Utopia***] <Philosophy>

10A. Buildings created by this architect, such as the National Farmers Bank, were called "Jewel Boxes." Dankmar Adler and what architect designed an early skyscraper in St. Louis called the Wainwright Building?
ANSWER: Louis **Sullivan** <Fine Arts>

10B. An increase in this quantity can permanently decrease interest rates according to the Mundell-Tobin effect. What quantity, which has demand-pull and cost-push types, is graphed inversely with unemployment on a Philipps curve?
ANSWER: **inflation** [accept **inflation** rate] <Social Science>

Period 3

1. Loss of a "viability factor" derived from these cells causes an "inherited dystrophy" called RP. These are the most-common type of cell to be regularly renewed via "disc shedding." These cells, whose dysfunction can cause nyctalopia ("nik-tah-LOP-ee-uh"), have a hypersensitive response to even just one photon because they contain the photopigment rhodopsin ("road-OPP-sin"). What photoreceptors responsible for night vision are found in the retina with cones?
ANSWER: **rod** cells [or **rod**s; accept **rod**-derived cone viability factor] <Science>

2. A character on this show named Ben Horne owns the hotel that houses an FBI agent who loves coffee and cherry pie. This show's 1992 prequel film is titled *Fire Walk With Me*, and its third season aired on Showtime in 2017. On this show, the evil entity BOB and The Man from Another Place are from the supernatural Black Lodge. David Lynch created what TV show in which Kyle MacLachlan's character Dale Cooper tries to solve the muder of Laura Palmer?
ANSWER: ***Twin Peaks*** <Pop Culture>

3. Rafael Pérez was a member of this organization who took part in its Rampart scandal. This organization was investigated by the Christopher Commission in 1991 after a man who asked "Can we all just get along?" was assaulted. This organization's leader Daryl Gates resigned after the Watts Riots. What law enforcement agency that was criticized for its attack on Rodney King is based in Southern California?
ANSWER: **Los Angeles Police Department** [or **LAPD** or **L.A. Police Department**] <History>

4. While in the form of a seal, this deity fought Heimdall for the necklace Brisingamen. That necklace belonged to Freya, whom this deity claimed performed incest in a namesake "flyting." This deity's mouth was sewn shut after a contest with the sons of Ivaldi. This deity was caught by a net while in the form of a salmon. This deity was bound to a rock and had venom dripped into his eyes for causing the death of Baldr ("ball-der"). The wolf Fenrir ("FEN-reer") was fathered by what Norse trickster god?
ANSWER: **Loki** <Mythology>

5. In this technique, dissolved oxygen bubbles may cause "ghost" signals. This technique's molecular exclusion form is based on an ion's affinity for a resin, while a column of gel is used in its size exclusion form. The Kovats index is used in one form of this technique to compare retention times. Silica gel separates compounds by polarity in this technique's "thin-layer" form. A paper "stationary phase" may be used in what technique that separates pigments by the rates at which they travel?
ANSWER: **chromatography** [accept specific types, such as paper **chromatography** or gas **chromatography** or thin-layer **chromatography** or size-exclusion **chromatography**] <Science>

6. This poem's speaker hails its subject as a "Prophet" and a "thing of evil." Later, the speaker wonders of clasping a "sainted maiden" within the "distant Aidenn." This poem's subject refuses to say its name on the "Night's Plutonian Shore" and stands on a bust of Pallas. The speaker longs for Lenore in what Edgar Allan Poe poem about a bird that repeats "nevermore?"
ANSWER: "The **Raven**" <Literature>

7. After arriving in London, this man gave the Appeal of 18 June speech. This man instructed a boycott during the Empty Chair Crisis, and he was the subject of Frederick Forsyth's novel *The Day of the Jackal*. While visiting Montreal, this man yelled "Vive le Quebec libre!" This man granted Algeria independence after signing the Évian ("ayv-YAHN") Accords. What leader of the Free French forces during World War II later served as president?
ANSWER: Charles **de Gaulle** <History>

8. Nicholas Roerich ("RARE-ick") designed the costume and sets of this ballet, whose final movement features an erratic 7/4 ("seven-four") rhythm. At the premiere of this ballet, Camille Saint-Saëns ("san-SON") apocryphally remarked "if that is a bassoon then I am a baboon!" "Adoration of the Earth" is the first part of this ballet, whose 1913 premiere included a riot. A girl dances herself to death in what ballet by Igor Stravinsky?
ANSWER: *The **Rite of Spring*** [or *Le **Sacre du printemps***] <Fine Arts>

9. This country's protest song "Baraye" ("bah-RAH-yeh") was used by members of its Woman, Life, Freedom movement. Protestors raised this country's historic Lion and Sun flag during a period of unrest that began with shopkeepers going on strike over this country's devaluation of the rial. Violence by the Revolutionary Guards and a nationwide internet shutdown disrupted protests in what Middle Eastern country that is led by Ayatollah Khamenei ("hah-may-NEE")?
ANSWER: **Iran** [or Islamic Republic of **Iran**] <Current Events>

10. A story by this author ends with a fire that destroys a chess-playing robot and its creator. In another story by this author, the title character falls asleep while walking and eventually ends up at his farmhouse before feeling a stunning blow upon the back of the neck. What author of "Moxon's Master" wrote about a man's dying hallucinations during his hanging for sabotage in the story "An Occurrence at Owl Creek Bridge"?
ANSWER: Ambrose **Bierce** <Literature>

11. This word names groups that equal their own commutator subgroup, and graphs whose chromatic number equals the size of their maximum clique in every subgraph. The Euclid–Euler theorem posits a 1-to-1 bijection between these numbers and Mersenne primes. This word follows "quasi" and "almost" for numbers whose divisors sum to 2n plus 1 and 2n minus 1. Twenty-eight and six are examples of what type of numbers that equal the sum of their positive proper divisors?
ANSWER: **perfect** [accept **perfect** groups or **perfect** graphs; accept **perfect**, quasi**perfect**, or almost **perfect** numbers] <Science>

12. The Maloe More Strait separates this lake from its island of Olkhon. This lake is considered sacred by the Buryat people who live around it. A small earless seal called the nerpa is endemic to this lake. The Angara River is the primary outflow of this lake, and both are part of the Yenisey River basin. The Lena River has its source in mountains named for what ancient Siberian lake that is the deepest in the world?
ANSWER: Lake **Baikal** <Geography>

13. These programs are the subject of Aho, Lam, Sethi, and Ullman's *Dragon Book*. These programs may perform constant propagation and peephole optimizations. Bootstrapping is when these programs execute in the language in which they were written. These programs may operate just-in-time and perform loop unrolling. These programs, which include clang, gcc, and javac ("java-C"), differ from related "interpreters." What programs translate source code into lower-level executable code?
ANSWER: **compiler**s <Science>

14. Victor Malca Villanueva helped lead a self-coup in favor of this country's president, who has been elected under the Cambio 90 party. In this country, the death squad Grupo Colina, carried out the Barrios Altos massacre against a communist organization founded by Abimael ("ah-bee-my-ELL") Guzmán. The Shining Path was active in this country, where Mario Vargas Llosa ("YO-sah") lost a presidential election to Alberto Fujimori. What South American country is led from Lima?
ANSWER: **Peru** [or Republic of **Peru** or República del **Peru**] <History>

15. This author discussed the evolution of language in his "De vulgari eloquentia" and wrote about the daughter of Folco Oortunari in *La Vita Nuova*. The central character of a work by this author meets a lion, a leopard, and a she-wolf in a dark wood. That character created by this author passes through a gate marked "Abandon all hope, ye who enter here," and is led by Virgil through Hell. What Italian author wrote *The Divine Comedy*?
ANSWER: **Dante** **Alighieri** [accept either] <Literature>

Additional Questions

Tossups

1. This character is stumped when his Benamuckee-worshipping companion asks why God doesn't kill the devil. This character, who was based on Alexander Selkirk, sells his friend Xury ("ZUR-ee") into slavery. This character builds a farm with former cannibals, including one named after the day on which they met, Friday. This character is stranded on the "Island of Despair" for 28 years. Name this title character of a novel by Daniel Defoe.
ANSWER: **Robinson Crusoe** [accept either] <Literature>

2. A president of a company in this industry is often misquoted as saying "What's good for [his company] is good for the country." A magnate in this industry said customers could have his product in any color "as long as it's black." That magnate in this industry instituted a five-dollar a day wage and developed the assembly line manufacturing process. What industry historically centered in Detroit, Michigan includes GM and Ford?
ANSWER: **auto**motive industry [or **auto**mobile industry or **car** industry or **truck** industry; accept equivalents such as **auto**motive manufacturing] <History>

3. An artist from this movement diluted paints with turpentine in a "soak stain" technique in order to create works such as *Mountains and Sea*. A set of paintings from this movement that were set to be displayed in the Seagram Building are now in the artist's namesake "chapel" in Houston. The color field artist Mark Rothko was one of many New York-based artists in what movement also exemplified by Helen Frankenthaler and Jackson Pollock?
ANSWER: **Abstract Expressionism** [or **AbEx**; accept **color field** painting before mentioned; reject partial answers] <Fine Arts>

Directed Questions

4. Consider a right triangle with a shortest side of 20 and a hypotenuse of 29. What is the secant of the triangle's smallest angle?
ANSWER: **29/21** <Computational Math>

5. What language is the source of the names of the supercontinent Rodinia ("row-DINN-ee-ya"), the card game bridge, the futurist poetry genre Zaum, and a type of whale called the beluga?
ANSWER: **Russian** [accept **Russkiy** yazyk] <Foreign Language>