HSAPQ
High School Academic Pyramid Questions

1. In one of this author's plays, the audience receives a handbill upon entering the theater that states the number of acts cannot be specified because of potential incidents that may arise during its performance. In addition to *Each in His Own Way*, he wrote a play about a man who claims to be a Holy Roman Emperor after falling off his horse on the way to a ball, *Henry IV*. In one of his plays, a rehearsal of *Mixing it Up* is interrupted by the Father, the Mother, the Stepdaughter, the Son, and the Boy. For 10 points, name this Italian playwright of *Six Characters in Search of an Author*.
ANSWER: Luigi **Pirandello**

Bonus: The Fire Chief mentions the title character in passing. For 10 points each:
[10] Name this absurdist play about the Martins and the Smiths, one of whom notes that the title character "always wears her hair in the same style."
ANSWER: The *Bald Soprano* [or The *Bald Prima Donna*; or La *Cantatrice Chauve*]
[10] This Romanian-French playwright wrote *The Bald Soprano* as well as *The Killer*, which features his recurring character Bérenger, the protagonist of his play *Rhinoceros*.
ANSWER: Eugène **Ionesco**

2. One disease affecting this organ results from increased permeability in one of its basement membranes and is called minimal change disease. One major hormone secreted from this organ participates in a regulation system with angiotensin and aldosterone. One structure in this organ allows small ions to pass through but filters out platelets and protein, and this organ's loop of Henle helps concentrate urine. For 10 points, name this organ, whose basic functional unit is the nephron.
ANSWER: **kidney**s

Bonus: For 10 points each, name these osmoregulatory structures of other organisms.
[10] Insects use these "tubules" named after a seventeenth-century Italian biologist.
ANSWER: **Malpighian** tubules
[10] Some protists have this specialized type of vacuole that allows them to pump out excess water.
ANSWER: **contractile** vacuole

3. The Macedonian Heresy was condemned at the Council of Constantinople because of views on this figure. The filioque clause controversy between the Orthodox and Catholic churches is a dispute over where this figure comes from. In the Bible, this figure is depicted as giving the power to speak in tongues after causing fire to appear over the heads of the Apostles at the first Pentecost. Its role is to help people lead a Christian life on Earth. For 10 points, name this third person of the Trinity that is not the Father or the Son.
ANSWER: the **Holy Spirit** [or **Holy Ghost**; or **Spiritus Sanctus**]

Bonus: She replaces Vashti as the wife of Ahasuerus. For 10 points each:
[10] Name this namesake of an Old Testament book, whose bravery in saving the Jews is celebrated at Purim.
ANSWER: **Esther**
[10] This advisor to Ahasuerus, who has his name overshadowed by Graggers on Purim, ends up hanging on his own gallows after his plot to massacre the Jews fails.
ANSWER: **Haman**

4. Apollodorus of Damascus designed a new forum during this emperor's rule, and this emperor sent Pliny the Younger to Bithynia to review corruption there. He ended the independence of the kingdom of Nabatea, and conquered the city of Sarmizegatusa after a war with Decebalus, which earned this emperor the title of Dacicus. Dying while returning from a campaign in Parthia, he was the adopted son of Nerva. For 10 points, name this Roman emperor, the namesake of a column in Rome.
ANSWER: **Trajan** [or Marcus Ulpius **Traianus**]

Bonus: It was represented by Karl von Hardenburg at the Congress of Vienna. For 10 points each:
[10] Name this European state that defeated Austria in the Seven Weeks' War.
ANSWER: **Prussia** [or **Preusen**]
[10] The Peace of Oliva saw this king, who reigned from 1640-1688, known as the "Great Elector," become the first Prussian duke to rule without the suzerainty of Poland.
ANSWER: **Frederick William** [or **Friedrich Wilhelm**]

5. This artist recorded the albums *Sorcerer* and *Nefertiti* with his second quintet, which included Ron Hancock, Tony Williams, Wayne Shorter, and Herbie Hancock. He collaborated with Gil Evans on an album based on Rodrigo's *Concerto De Aranjuez for Guitar and Orchestra*, *Sketches of Spain*. This musician fused jazz and rock on *Bitches Brew*, and recorded the songs "Freddie Freeloader" and "So What" for an album that pioneered modal jazz. For 10 points, name this jazz trumpeter who recorded *Kind of Blue*.
ANSWER: Miles **Davis**

Bonus: For 10 points each, name this Ingmar Bergman films.
[10] In this film, Max von Sydow plays a knight returned from the Crusades, who stakes his life on a chess game against Death.
ANSWER: The *Seventh Seal*
[10] Isak Borg undergoes a journey of self-discovery while on the way to Lund University in this film.
ANSWER: *Wild Strawberries*

6. Immanuel Kant noted that because Eskimos are dependent upon the ocean to provide them with wood, this phenomenon is widespread in their society. In International Relations Theory, realists reject a theory which states that the spread of democracy and trade leads to this, and instead argue that it is caused by deterrence. The Mongol and Roman Empires are sometimes credited with creating namesake periods of this because of their overwhelming power. For 10 points, name this phenomenon marked by the absence of war.
ANSWER: **peace**

Bonus: This process is the subject of both Condorcet's paradox and Arrow's Impossibility Theorem, and it can come in Single Transferable or List varieties. For 10 points each:

[10] Name this basic activity of democracy, which was guaranteed to former slaves by the 15th amendment.
ANSWER: **voting**
[10] In this process, named for the Revolutionary War-era governor of Massachusetts, Congressional districts are drawn to blatantly favor one party, which can dilute voting power.
ANSWER: **gerrymander**ing

7. The first building in this city was the Peter and Paul Fortress, and it was once governed by Sergei Kirov. Historical ships moored in this city include the cruiser *Aurora*. This city's Church of the Savior on Spilled Blood was built after an assassination in this city, which survived a nine-hundred-day Nazi siege during World War II. This home of the Winter Palace was renamed "Petrograd" in 1904, but another name change followed after it was the site of the October Revolution. For 10 points, name this second largest city of Russia, formerly known as Leningrad.
ANSWER: **Saint Petersburg** [or **Sankt Petersburg**; or **Leningrad** or **Petrograd** until mentioned]

Bonus: He was defeated at the 48 BC Battle of Pharsalus, while his son was dealt his final defeat at 45 BC's Battle of Munda. For 10 points each:
[10] Name this member of the First Triumvirate, the archrival of Julius Caesar.
ANSWER: **Pompey** the Great [or Gnaeus **Pompeius** Magnus]
[10] Before entering into a civil war with Julius Caesar, Pompey obliterated this defiant king of Pontus. He had earlier fought against the forces of Sulla.
ANSWER: **Mithridates** the **Great** [or **Mithridates VI**; prompt on **Mithridates**]

8. A filter has this property if no additional frequencies are added to a signal passing through it. A system has this property if, for any inputs x_1 and x_2, T of c times x_1 equals c times T of x_1 and T of x_1 plus x_2 equals T of x_1 plus T of x_2. A basis is formed from a set of vectors that are independent in this way, and all functions of first degree have this property. For 10 points, name this property that is exhibited by functions of the form $y = mx+b$.
ANSWER: **linear**ity

Bonus: Solutions to systems of linear equations can be found by computing the determinant of square types of them. For 10 points each:
[10] Name these representations which consist of M rows and N columns.
ANSWER: **matrix** [or **matrices**]
[10] Instead of solving an entire system of equations at once, one can use this useful rule to solve for individual variables by finding the determinants.
ANSWER: **Cramer**'s rule

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Arts
Current Events
Geography
History
Literature
Math Calculation
Mythology
Social Science

9. 1908 saw the assassination of this nation's King Charles I; in 1385, John I founded this nation's Aviz dynasty. This nation's final monarch, Manuel II, was overthrown in 1910, and for much of the next century its Estado Novo was led by the dictator António Salazar. Centuries earlier, this nation experienced a golden age in which Pedro Cabral and Vasco de Gama helped realize the maritime empire envisioned by Prince Henry the Navigator. For 10 points, name this European country that shares the Iberian Peninsula with Spain.
ANSWER: **Portugal** [or **Portuguese Republic**, or **República Portuguesa**]

10. In addition to causing the retrieval of v-SNARE proteins, the coat protein COP I targets proteins for this organelle, while COP II targets proteins exiting this organelle. The common sequence KDEL marks proteins for retention in this organelle, and most proteins synthesized in one type of this organelle undergo glycosylation. Ribosomes are present on the surface of one type of this organelle. For 10 points, name this organelle that comes in rough and smooth forms and provides a transport network throughout the cell.
ANSWER: **endoplasmic reticulum** [accept **ER**]

11. One author who wrote in this language told of a man named after John Chrysostom in his novels *The Filibustering* and *Noli Me Tangere*. Another author who wrote in this language told of a man who beheads a horse and locks his father in a close to die of rabies in *The Family of Pascal Duarte*. In addition to Rizal and Cela, another author in this language wrote "Tonight I can write the saddest lines," and began "this is the hour of departure" at the beginning of his "Song of Despair." For 10 points, name this language, the native tongue of Pablo Neruda.
ANSWER: **Spanish** [accept **español**]

12. One piece in this work represents pale light radiated from skulls by adapting this suite's opening theme to a minor key. Another ends with four measures played "velocissimo" and "con tutta forza" to represent the cry of a dwarf walking on deformed legs. In addition to "Con Mortuis in Lingua Mortua" and "The Gnome," this suite includes a piece which represents the flight of Baba Yaga, "The Hut on Fowl's Legs." It includes "Promenades" representing the composer walking to view the paintings of Victor Hartmann. For 10 points, name this suite by Modest Mussorgsky.
ANSWER: *Pictures of an Exhibition* [or *Pictures at an Exhibition*; or *Pictures from an Exhibition*]

13. In this movie, a man offers cold bottles of Coca Cola to the main character and his brother, and that brother claims, "babies pay double" when he is employed to pick up orphans off the street. Later, the main character is told to look on Cherry Street after giving a blind singer $100, and when there, his brother kills Maman. The main character works as a chai wallah, and makes a random guess that Aramis was the third musketeer after calling Latikah. For 10 points, name this Danny Boyle movie in which Jamal Malik wins 20 million rupees on an Indian gameshow, starring Dev Patel.
ANSWER: **_Slumdog Millionaire_**

14. The Sieg joins this river at Niederkassel, and the Neckar joins it after flowing past Heidelburg and Mannheim, where it turns west. The Battle of Teutoburg Forest established it as the Roman northern frontier, and its namesake crisis occurred when Adolphe Thiers discussed making it a border. Its delta begins to form shortly before Arnheim. The Treaty of Versailles declared the area around it a demilitarized zone, and it flows past Bonn and Cologne on its way to the North Sea. For 10 points, name this river of West Germany.
ANSWER: **Rhine** River

Arts: This composer's piece *Vexations* inspired John Cage's *4'33"*. For 15 points, name this French composer who mentored Les Six and used no bar lines in his *Gnossiennes* and *Gymnopedies*.
ANSWER: Erik **Satie**

Current Events: This man beat such Republican opponents as Mark Augusti and Tom Hanson to win his Fifth District seat in Illinois. For 15 points, name this man who currently serves as Barack Obama's White House Chief of Staff.
ANSWER: Rahm Israel **Emmanuel**

Geography: Features of this island include the Barisan Mountains, and large cities include Medan and Palembang. For 15 points, name this island of Indonesia separated from the Malay Peninsula by the Strait of Malacca.
ANSWER: **Sumatra**

History: This author of the Tamworth Manifesto of the Conservative Party lent his name to a group of moderate Tories that united in opposition to the Corn Laws. For 15 points, name this two-time British prime minister, who lent his first name to the "Bobbies" of the London Metropolitan Police.
ANSWER: Sir Robert **Peel**

Literature: He drew on his time at Leoncio Prado Military Academy to write *The Time of the Hero*. For 15 points, name this Peruvian writer who interspersed an autobiographical relationship with the mental deterioration of Pedro Camacho in *Aunt Julia and the Scriptwriter*.
ANSWER: Mario **Vargas Llosa**

Math Calculation: A square is formed by increasing a rectangle's length by 40 percent and decreasing its width by 40 percent. For 15 points, find the minimum positive integer value of the original width.
ANSWER: **7**

Mythology: This god was worshiped by the Hyksos, who banned hippopotamus hunting because the hippo was sacred to him. For 15 points, name this Egyptian god of chaos, who killed Osiris.
ANSWER: **Set**h [accept **Sutekh**; accept **Setech**]

Social Science: According to this book, the "call to adventure" and "road of trials" are the first two stages of the primitive monomyth, from which all legends and myths can be traced. For15 points, name this work of comparative mythology by Joseph Campbell.
ANSWER: *The **Hero with a Thousand Faces***

15. The Rakhine people of this modern day country were conquered by Bowdapaya of the Konbaung dynasty. The third of their namesake wars with Britain saw the defeat of King Thibaw Min. One person from this country founded the Tatmadaw and fought against the Japanese during World War II, but was assassinated in 1947. That man was the father of Aung San Suu Kyi, who is currently imprisoned by its military junta. For 10 points, name this Asian country with capital at Rangoon.
ANSWER: **Burma** [or Union of **Myanmar**]

Bonus: Name the following Shakespearean characters who share a common means of death, for 10 points each.
[10] This supposedly mad prince of Denmark is stabbed after Claudius gets Laertes to take vengeance for Polonius' death.
ANSWER: **Hamlet**
[10] After killing Mercutio, this Capulet is killed by an enraged Romeo, leading to Romeo's exile and eventual death.
ANSWER: **Tybalt**
[10] This king is assured that no man born of woman will hurt him, though apparently the assurance did not apply to men born via Caesaerean section.
ANSWER: **Macbeth**

16. In one of this man's novels, the narrator is forced to shoot a dachshund "immobilized by dropsical fat" that belongs to Resi. Many of his short stories were collected in *Bagombo Snuff Box*, and he wrote a novel in which a race of furry, seal-like beings replaces humans after an apocalypse, *Galapagos*. This author also wrote a novel about Malachi Constant's journey to a moon of Saturn, and a novel about a man "unstuck in time," Billy Pilgrim. For 10 points, name this author of *The Sirens of Titan* and *Slaughterhouse-Five*.
ANSWER: Kurt **Vonnegut**

Bonus: The Hirsch and Büchner varieties of this device can be used in vacuum filtration applications. For 10 points each:
[10] Name these devices consisting of a pipe with narrow stem and wide mouth, which prevent spillage of liquids and powders when they are poured.
ANSWER: **funnel**
[10] Unlike the Florence flask, this other piece of laboratory glassware possesses a flat, circular base and a cylindrical neck.
ANSWER: **Erlenmeyer** flask
[10] In this chemical technique, a mixture consisting of a compound and an impurity is separated by dissolving the mixture in a solvent and slowly cooling the solution to retrieve the compound.
ANSWER: **recrystallization**

17. Apart from being the god of war, Hadur is the god of this in Hungarian paganism. The Norse god of this is Wayland, and the goose-riding Visvakarma is the Hindu god of it. The Finnish god of this created the sampo, or mill of plenty, and is named Ilmarinen. The Greek god of this created Pandora out of dirt, and once spent nine days and nights falling from Mount Olympus. That god was married to Aphrodite despite being lame, and created the shield of Aeneas. For 10 points, name this role played by Hephaestus, which involves making things from heated metals.
ANSWER: **smith**ery [accept clear equivalents like divine **smith**s; accept **copper smith**ery before "Norse"; accept early **metalworking** or equivalents]

Bonus: This candidate ran on the slogan "Shall the People Rule?" in the 1908 presidential election. For 10 points each:
[10] Name this candidate, who lost that election to William Howard Taft.
ANSWER: William Jennings **Bryan**
[10] In this election, Bryan won the Democratic nomination by giving the Cross of Gold speech, but lost to William McKinley.
ANSWER: Election of **1896**
[10] Bryan gave the popular lectures "The Value of an Ideal" and "The Prince of Peace" for this adult education movement that began in New York in the late 19th century.
ANSWER: **Chautaqua**

18. This man's paper "On the Influence of Carbonic Acid in the Air Upon the Temperature on the Ground" is considered an early formulation of the greenhouse effect. He used the example of cane sugar in a paper deriving his namesake equation from the van't Hoff equation. This man defined an acid as a substance that increases the hydrogen ion concentration of a solution. For 10 points, name this Swedish chemist, whose namesake equation includes a pre-exponential factor and gives the reaction rate constant as a function of temperature and activation energy.
ANSWER: Svante **Arrhenius**

Bonus: In the lower left, a woman shields her face from this painting's central event. For 10 points each:
[10] Name this painting housed at Jefferson Medical College, which depicts the title doctor performing an operation while rows of students watch.
ANSWER: The **Gross Clinic**
[10] The Gross Clinic was painted by this American artist, who painted a portrait of his friend Walt Whitman, and depicted many naked boys in The Swimming Hole.
ANSWER: Thomas **Eakins**
[10] This earlier artist also depicted a medical procedure in his Anatomy Lesson of Dr. Tulp. His other secular paintings include The Night Watch.
ANSWER: **Rembrandt** van Rijn

19. This work sees the protagonist visit a doctor who claims, "I am not such a fool as I look" before measuring the size of the protagonist's cranium. One character in this work paints a small work showing a blindfolded woman carrying a candle. Another character in this work writes "Exterminate all the brutes!" on a pamphlet; that character's demise is related by an "insolent black head" claiming, "he dead." For 10 points, name this work in which Marlow boats up the Congo to retrieve the ivory trader Kurtz, by Joseph Conrad.
ANSWER: **Heart of Darkness**

Bonus: This experiment was allegedly conceived based on the analogy of two swimmers, one going across a river and back while the other headed upstream, then back downstream. For 10 points each:
[10] Name this experiment that used an interferometer to show that the speed of light was the same in all directions.
ANSWER: **Michelson-Morley** experiment
[10] The Michelson-Morley experiment poked huge holes in the theory of this substance, which was supposed to be the medium through which light moved.
ANSWER: luminiferous a**ether**
[10] This Dutch scientist argued that the result was caused by length contraction due to the ether, though his equation was rewritten by Einstein to incorporate the idea of space-time contraction.
ANSWER: Hendrik Antoon **Lorentz**

20. In March 2009, the D0 group announced the discovery of the production of a single one of one of these objects through the weak force. That one has a mass comparable to a gold atom nucleus, and was the sixth and last to be discovered. In addition to the "top" one, the "up" and "down" ones make up protons and neutrons. Their name was coined by Murray Gell-Mann after a passage from *Finnegan's Wake*. For 10 points, name these subatomic particles, believed to be fundamental constituents of matter.
ANSWER: **quark**s [accept early **top** quark]

Bonus: This story appears in the collection *Nine Stories*. For 10 points each:
[10] Name this short story, whose protagonist relates the story of the title creature to Sybil on the beach and then puts a bullet through his right temple, all while on a honeymoon with his wife Muriel.
ANSWER: "A **Perfect Day for Bananafish**"
[10] "A Perfect Day for Bananafish" was written by this author of *Franny and Zooey*, who wrote about Holden Caulfield and his sister Phoebe in *The Catcher in the Rye*.
ANSWER: Jerome David "J. D." **Salinger**
[10] "A Perfect Day for Bananafish" is one of many Salinger works to feature this family, whose members include Bessie, Seymour, Walt, Waker, and the aforementioned Franny and Zooey.
ANSWER: **Glass** family

21. Richard Olney claimed that this event brought the nation to "the ragged edge of anarchy", and a meeting at Briggs House led by Samuel Gompers cautioned against sympathy action in this event. John Peter Altgeld refused to dispatch state militia to quell this event, and federal action was taken to quell it due to interference with the mail service. Clarence Darrow defended its leaders on contempt charges arising from this event, and it was broken in part due to Grover Cleveland's ordering of 2,500 federal troops to Chicago. For 10 points, name this 1894 strike of railroad workers led by Eugene V. Debs.
ANSWER: **Pullman** Strike

Bonus: Name these figures important in the origins of analytic philosophy, for 10 points each.
[10] This British author of *The Problems of Philosophy* and "On Denoting" worked with Alfred North Whitehead to write *Principia Mathematica*.
ANSWER: Bertrand **Russell**
[10] Much early work in analytic philosophy was built out of a rejection of the idealism of this German philosopher of *The Phenomenology of Spirit*. He also developed the dialectic.
ANSWER: Georg Wilhelm Friedrich **Hegel**
[10] This early analytic philosopher preceded Russell and Whitehead in attempting a system of formal logic in his *Concept Script* as well as writing "On Sense and Reference."
ANSWER: (Friedrich Ludwig) Gottlob **Frege**

22. Gerald Malanga was a longtime assistant of this artist, who pictured images of devastating accidents in his series *Death and Disaster*. This artist created a sculpture of helium-filled balloons, *Silver Clouds*, as well as wallpaper depicting cows. He was shot by the founder of the Society for Cutting up Men, Valerie Solanas, in his studio, The Factory. This artist used silkscreens for his paintings of Mao Zedong and Marilyn Monroe. For 10 points, name this American pop artist who painted numerous Campbell's soup cans.
ANSWER: Andy **Warhol** [or Andy **Warhola**]

Bonus: This country joined with Syria to form the United Arab Republic. For 10 points each:
[10] Name this Middle Eastern nation led by Anwar Sadat and Hosni Mubarak.
ANSWER: **Egypt**
[10] Along with Muhammed Naguib, this man led the revolt against King Farouk before leading Egypt from 1956 to 1970.
ANSWER: Gamal Abdel **Nasser**
[10] Despite not being an approved party, this radical religious political party formed in 1928 won eighty-eight seats running as independents in the 2005 elections.
ANSWER: **Muslim Brotherhood**

1. This man was falsely convicted of corruption in 1712, for which he spent time in the Tower of London. He reluctantly declared the War of Jenkins' Ear, and opposition from Whigs such as John Gay and Henry Fielding prompted him to pass the Licensing Act of 1736. He first came to prominence with his handling the aftermath of the South Sea Bubble, and George II gave this man the gift of 10 Downing Street. For 10 points, name this first prime minister of Great Britain.
ANSWER: Robert **Walpole**

2. This author wrote a collection of American fairy tales, including "Poker Face the Baboon and Hot Dog the Tiger," narrated by Potato Face Blind Man. His collection *Other Days* includes his poems "Letter to Dead Imagists" and "I am the People-the Mob." This author of *Rootabaga Stories* wrote a poem comparing the onset of fog to the movement of "little cat feet," and a poem describing the title entity as "fierce as a dog with tongue lapping for action" and "Hog Butcher of the World." For 10 points, name this American poet of *The People, Yes* and "Chicago."
ANSWER: Carl **Sandburg**

3. This man names a method for solving linear systems of equations with Seidel, as well as a theorem that relates curvature to Euler characteristic with Bonnet. Replacing the electric field with the gradient of the potential in a namesake law gives Poisson's Equation, and magnetic monopoles are disallowed by another namesake law. The Divergence Theorem is named for this man, and he names a law that gives the electric flux through a surface as proportional to the enclosed charge. For 10 points, name this German mathematician who names two of Maxwell's equations.
ANSWER: (Johann) Carl Friedrich **Gauss**

Extra 20-point bonus:
One of these rules states that electrons in singly occupied orbitals must have identical spins. For 10 points each:
[10] Name these rules, which also state that all orbitals in a subshell must be singly occupied with electrons before any orbital can be doubly occupied.
ANSWER: **Hund**'s rules
[10] Hund's rules are applied in this other principle, which comes from the German for building up, and states that electrons will fill up the lowest energy state available before higher states.
ANSWER: **Aufbau** principle

Extra 30-point bonus:

This artist never completed his massive painting *The Battle of Anghiari*. For 10 points each:

[10] Name this student of Verrocchio, who arranged the figures of his painting *The Virgin and Child with St. Anne* in a pyramid.

ANSWER: Leonardo **da Vinci**

[10] This da Vinci painting portrays a woman with a notoriously enigmatic smile.

ANSWER: ***Mona Lisa*** [or *La **Gioconda***]

[10] da Vinci created a sketch of a man inscribed inside a circle and a square, inspired by this Roman architect who described such ideal proportions in *De Architectura*.

ANSWER: **Vitruvius**