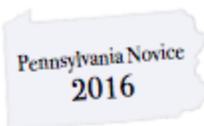


## Pennsylvania Novice 2016

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### Packet 5 Tossups

**1. After being pushed down a cliff, Tom Lorker is taken to a Quaker Settlement in this book. This novel begins on the farm of Arthur Shelby, who is in serious debt. This novel features the discovery that Cassy's long lost daughter is Eliza when the two of them meet in Canada, which Eliza reached after crossing the frozen (\*) Ohio River with a child in her arms. The vicious master Simon Legree has the title character of this book whipped to death. For 10 points, name this abolitionist novel written by Harriet Beecher Stowe.**

ANSWER: Uncle Tom's Cabin

**2. Both Schumann and Grieg wrote A-minor works in this genre. The second of this type of work by Sergei Rachmaninov opens with bell-like notes played by the soloist in a crescendo. The fifth of these works by (\*) Beethoven opens by alternating passages from the soloist with chords from the whole orchestra and is nicknamed the "Emperor." For 10 points, name this type of work for orchestra and a certain keyboard instrument.**

ANSWER: piano concerto (prompt on partial answer)

**3. This man served Prusias I late in his career. During the Battle of Ticinus, this general used Numidian cavalry to outflank his enemy. He executed a massive ambush against Flaminius at Lake Trasimene. This man used encirclement tactics to crush enemy forces at the Battle of (\*) Cannae, and he was defeated at Zama by Scipio Africanus. For 10 points, name this Carthaginian general, who, during the Second Punic War, marched battle elephants across the Alps to attack Italy.**

ANSWER: Hannibal Barca (prompt on Barca)

**4. Nylon fibers are very strong due to many of these interactions between each polymer molecule. Alpha helices and beta sheets in proteins are stabilized by these interactions. Two of them are found in a base pair between adenine and thymine on opposite strands of the (\*) double helix of DNA. Many instances of this interaction in water cause its abnormally high boiling point. For 10 points, identify this intermolecular force between an atom of nitrogen, oxygen, or fluorine and an atom of the namesake lightest element.**

ANSWER: hydrogen bonds

**5. The wife of one enemy of this person is said to be condemned to be hung by a palm vine for throwing thorns at this person's feet. This man is said to have traveled on a winged horse during a journey known as the Isra and Mi'raj, or The Night Journey. His sayings and teachings are collected in the (\*) Hadiths. This prophet received the revelation of God in a cave from the angel Gibril, and he fled during the Hijra to Medina from his hometown of Mecca. For 10 points, name this founder and prophet of Islam.**

ANSWER: Muhammed

**6. Cave mold from the Larzac plateau is used in one variety of this product that employs penicillium to create distinctive colors. In addition to the Roquefort variety, a variation on this product developed in a namesake village in Somerset involves reducing the whey content and stacking loaves before salting. The enzyme rennet is often used in the production of this product to separate (\*) curds from whey. Its chevre [CHEV-ruh] variety is made from goat's milk. For 10 points, name this dairy product whose varieties include paneer, pepperjack, and cheddar.**

ANSWER: cheese

**7. During this war, the French under the Duc d'Enghien defeated the Spanish at Rocroi after the Siege of Arras. Early in this war, forces loyal to the elector of the Palatine, Frederick V of Bohemia, were crushed at the Battle of White Mountain. The forces of the Catholic Count Wallenstein were defeated by (\*) Gustavus Adolphus and his Swedish army during this war. This conflict began after the Defenestration of Prague, and was ended by the Peace of Westphalia. For 10 points, name this war which ravaged Germany between 1618 and 1648.**

ANSWER: The Thirty Years' War

**8. One of this man's poems urges the reader to "Grow old along with me!" because "the best is yet to be" and is entitled "Rabbi ben Ezra." One of his narrators fixates on his lover's hair before he winds it "three times her little throat around" and strangles her. Along with "Porphyria's Lover," another of his deranged speakers shows off a portrait of his (\*) former wife whose heart was "too soon made glad." For 10 points, name this Victorian poet of "My Last Duchess," the husband of Elizabeth Barrett.**

ANSWER: Robert Browning

**9. The Green-Tao theorem showed the existence of arbitrarily long arithmetic progressions comprised of these numbers. An unproven statement about these numbers is that every even integer greater than 2 can be expressed as the sum of two of these. That statement is Goldbach's conjecture. One early algorithm for finding them is the (\*) Sieve of Eratosthenes. Euclid showed that there are infinitely many of these numbers. For 10 points, name this class of numbers, which comprise the non-composite integers and are divisible only by one and themselves.**

ANSWER: prime numbers (accept primes)

**10. Many dinosaur fossils have been found along the shores of this river's Fort Peck Lake. This river flows from Brower's Spring in the Centennial Mountains through its namesake "Breaks" region before passing over its Great Falls in Montana. Tributaries of this river include the Osage and the (\*) Platte. This river flows past cities such as Sioux Falls and Omaha before ending in St. Louis. For 10 points, name this North American river, which joins the Mississippi in its namesake state.**

ANSWER: Missouri River

**11. In one aria in this opera, the chorus responds with "Take guard yourself!" while the singer claims that love is a rebellious bird. That aria in this opera takes place in front of a tobacco factory and is set to a habanera rhythm as a soldier disobeys orders to arrest the title character. Escamillo sings the (\*) Toreador Song to woo the title character, whose death by stabbing at the hands of Don Jose is foretold in a fortune-telling scene. For 10 points, name this opera by Georges Bizet about the namesake Spanish gypsy.**

ANSWER: Carmen

**12. Feyisa Lilesa made a crossed-arms symbol during one part of this event. At the end of another part of this event, Islam El Shehaby refused to shake Os Sasso's hand. At the end of this event, Shinzo Abe emerged from a green pipe in a Super Mario Hat. A gas station owner claimed four participants in this event (\*) urinated behind his building and part of the Maria Lenck Aquatic Center turned green during this event. For 10 points, name this 2016 event where Americans such as Katie Ledecky and Simone Biles won gold medals.**

ANSWER: 2016 Summer Olympics or Rio Olympics or Rio 2016 (Accept marathon before "Islam"; prompt on more specific answers like boxing or swimming; prompt on partial answers like The Olympics)

**13. During the Rivonia trial, this man gave the "I am prepared to die" speech. Following the 1995 Rugby World Cup this man handed the trophy to his country's captain, Francois Pienaar. He assumed his highest post after spending 27 years at the notorious (\*) Robben Island Prison for charges of treason. This man succeeded F.W. de Klerk as president of his country, and was his country's first president elected after apartheid. For 10 points, name this first black president of South Africa.**

ANSWER: Nelson Mandela

**14. In this organelle, malate is oxidized into oxaloacetate. Brown adipose tissue stores thermogenin in these organelles. The chemiosmotic hypothesis describes how an enzyme in this organelle's membrane is powered by a proton gradient during oxidative phosphorylation. This organelle is organized into (\*) folds called cristae, and the Krebs cycle takes place within it. It contains its own genome labeled mtDNA. For 10 points, identify this organelle where ATP synthesis occurs, the powerhouse of the cell.**

ANSWER: mitochondria

**15. This man once hunted the semi-divine boar Twrch Trwyth [toor TREW-eth], to help his kinsmen win the hand of Olwen. Tales about this figure were popularized by Thomas Malory and Geoffrey of Monmouth. He was wounded at the battle of Callmann, after which he was taken to the Isle of (\*) Avalon. This man, who was the son of Uther Pendragon, counted knights such as Sir Gawain and Sir Lancelot in his service. For 10 points, name this wielder of the sword Excalibur, who was the King of Camelot.**

ANSWER: King Arthur

**16. One immortal of this specific type imprisoned the Hundred-Handed Ones and Cyclopes in Tartarus. That example of these figures also castrated his own father before consuming five of his children. Another of these figures suffered an eagle eternally eating his liver after he was chained to a rock as punishment for (\*) stealing fire from Mount Olympus. In addition to Prometheus, a third one of these mythological figures was doomed to hold up the sky for all eternity. For 10 points, name these primordial deities of Greek myth, exemplified by Cronus and Atlas.**

ANSWER: Titans (prompt on Greek Gods)

**17. The Stern-Gerlach experiment discovered quantum spin by passing silver atoms through one of these entities. When produced by an electric current, the strength of this entity is calculated with the Biot-Savart Law, and also induce electric currents as predicted by (\*) Faraday's Law. A charged particle moving perpendicularly to it will have circular motion. The strength of these entities is measured in Teslas. For 10 points, name this kind of field often called the B-field, whose shapes can be visualized using iron filings.**

ANSWER: magnetic field (or B-field before mention; accept magnetic after "field" is read; do not prompt or accept "electromagnetic field")

**18. The death of two Guyanese immigrants in this city sparked the Crown Heights riots between its black and Jewish populations. In 1969, a police raid of this city's Stonewall Inn sparked the beginning of the modern LGBT movement. Peter Minuit purchased the land that would eventually become this city from Native Americans. Mayor Fiorello (\*) La Guardia took down this city's Tammany Hall political machine. In 2001, two planes crashed into its World Trade Center. For 10 points, name this most populous city in the United States.**

ANSWER: New York City

**19. One character in this novel botches an operation on Hypolite's broken leg once his first wife, Heloise, dies. Monsieur Homais is a pharmacist in this novel who undermines the reputation of the protagonist's husband, Charles, in the town of Yonville. The title character of this novel has affairs with (\*) Rodolphe Boulanger and Leon Dupuis while accruing an enormous debt, which leads to her suicide via arsenic. For 10 points, name this novel about a French doctor's wife by Gustave Flaubert.**

ANSWER: Madame Bovary

**20. A group of artists named for a painting that shows a rider wearing this color included Franz Marc and Wassily Kandinsky. A painting with this color in the title by Thomas Gainsborough shows a young boy holding a hat and wearing a suit made almost entirely of this color. (\*) Lapis Lazuli was used to create a striking form of this color in ancient art. A painting tinged with this color shows an elderly man in the streets of Barcelona playing a musical instrument. For 10 points--*The Old Guitarist* was painted by Pablo Picasso during a period named for what melancholy color?**

ANSWER: **blue**

**TB. During this conflict, a blockade caused one side to endure a “Turnip Winter” of massive famine. Victories at Masurian Lakes and Tannenberg were won on one of this war’s fronts by Erich Ludendorff. The Zimmerman Telegram was a failed attempt to get Mexico to enter this war, during which Manfred von (\*) Richthofen's 80 air victories earned him his reputation as “The Red Baron.” A U-boat torpedoed the *Lusitania* during this conflict. For 10 points, name this 1914 to 1918 war, which turned out not to be “The War to End All Wars.”**

ANSWER: **World War I** (or the **Great War**)

# Pennsylvania Novice 2016



## Packet 5 Bonuses

1. Answer the following questions about a class of pathogens, for 10 points each.

[10] These infectious agents introduce genetic material into cells and replicate. Some examples include chickenpox and influenza.

ANSWER: **viruses**

[10] These types of viruses target bacteria, making them a possible treatment against bacterial infection. The Hershey-Chase experiment used the T2 one to demonstrate DNA contains genetic information.

ANSWER: bacteri**ophages**

[10] In this type of viral reproduction, the virus replicates itself within the cell until the cell bursts and releases many new viral agents. It contrasts with the lysogenic cycle, where the virus remains dormant.

ANSWER: **lytic cycle**

2. This empire's second ruler, Humayun, died after falling down a set of stairs. For 10 points each:

[10] Name this empire of early modern India. Its rulers were Muslims, and it reached its greatest extent under Aurangzeb about 1707.

ANSWER: **Mughal** Empire (or **Mogul** Empire)

[10] The most famed architectural achievement of the Mughals is this white marble mausoleum built for the Emperor Shah Jahan's favorite wife, Mumtaz. Located in Agra, it is among the world's top tourist destinations.

ANSWER: The **Taj Mahal**

[10] The Mughal dynasty was founded by this man, who conquered much of Northern India after the Battle of Panipat in 1526.

ANSWER: **Babur**

3. The walls around this realm were built by a giant who asked for another the sun and the moon as payment. For 10 points each:

[10] Name this realm of Norse mythology, home of the Aesir, which contains Valhalla.

ANSWER: **Asgardr**

[10] Asgard and the other Norse realms are connected by the branches of Yggdrasil, a large one of these objects that Ratatosk the squirrel carries messages up and down between the realms.

ANSWER: world **tree**

[10] This gold-toothed watchman of the Aesir guards Asgard from the end of Bifrost. He will sound his Gjallarhorn at the onset of Ragnarok.

ANSWER: **Heimdallr**

4. This poem ends with a call to honor the "noble six hundred." For 10 points each,

[10] Name this poem about the title group who rode "into the valley of Death" during a Crimean War battle despite the inevitable failure of their action.

ANSWER: The **Charge of the Light Brigade**

[10] In addition to The Charge of the Light Brigade, this man also wrote about an old man's resolution "to strive, to seek, to find, and not to yield" in the poem "Ulysses."

ANSWER: Alfred, Lord **Tennyson**

[10] Tennyson ended each of his poetry collections with this poem, which explores the inevitability of death as the speaker hopes to see his "Pilot face to face" upon performing the title action.

ANSWER: **Crossing the Bar**

5. This painter produced a series of paintings involving three bathers, such as La Lux II. For 10 points each:

[10] Name this Fauvist artist, who depicted his wife with a stripe down her face in "The Green Line" and five nudes in a circle in "The Dance."

ANSWER: Henri **Matisse**

[10] A woman sets a table in Matisse's depiction of a room of this primary color, which was also used by Monet in his Impressionistic depictions of poppies.

ANSWER: **red**

[10] Late in life, Matisse's physical state declined to the point he could no longer paint, so he turned to make art in this form. It involves cutting out shapes from paper and pasting them together.

ANSWER: **collage**

6. This state contains Punalu'u beach, noted for its black volcanic sand. For 10 points each:

[10] Name this U.S. state where the Kilauea volcano continues to erupt on its Big Island. Its capital city is Honolulu.

ANSWER: **Hawaii**

[10] South of the Hawaiian islands lies this most populous island in French Polynesia that includes the territorial capital of Pape'ete. It is often used as a base to visit nearby islands like Bora Bora.

ANSWER: **Tahiti**

[10] This other Pacific island several thousand miles east of Tahiti is home to the *moai*, massive sculptures of human heads carved by its namesake civilization.

ANSWER: **Easter** Island (or **Rapa Nui**, or Isla de **Pascua**)

7. Answer these questions about fictitious forces in physics, for 10 points each:

[10] The fictitious Coriolis force, demonstrated by Leon Foucault's namesake pendulum, occurs in this type of reference frame. The analog of linear momentum for this kind of system is angular momentum.

ANSWER: **rotation** (or obvious equivalents)

[10] This other fictitious force is the force directed away from the axis the system is rotating around. It is not to be confused with centripetal force.

ANSWER: **centrifugal**

[10] When a rotating reference frame has a varying axis of rotation, it is said to be undergoing this process, exemplified by the axis of a gyroscope describing a cone shape.

ANSWER: **precession**

8. Name these works of early sci-fi literature, for 10 points each:

[10] In this Bram Stoker novel, Jonathan Harker saves his wife Mina from vampirism by defeating the titular Count, who is a resident of Transylvania.

ANSWER: **Dracula**

[10] This novel is told as a frame story when the crew of Robert Walton come upon a chemist pursuing the humanoid he created by re-animating dead parts. It was written by Mary Shelley.

ANSWER: **Frankenstein: or The Modern Prometheus**

[10] Several of this New England author's works feature cosmic horrors such as the octopus-headed Cthulhu. His works were only published in pulp magazines during his lifetime.

ANSWER: Howard Phillips "H.P." **Lovecraft**

9. The Federal army sent to suppress this rebellion was derisively called the "Watermelon Army." For 10 points each:

[10] Name this 1791 rebellion in Pennsylvania, resulting from anger over an excise tax on distilled spirits.

ANSWER: **Whiskey** Rebellion

[10] This First Secretary of the Treasury personally went out and led militia against the rebels to defend the government's new taxes. His portrait is on the 10 dollar bill.

ANSWER: Alexander **Hamilton**

[10] Also involved in suppressing the Rebellion was this former Revolutionary War General, nicknamed "Light Horse Harry." His son became far more famous as a Confederate commander.

ANSWER: Henry **Lee** III

10. This architect was inspired by the Rocky Mountains for his design of the National Center for Atmospheric Research. For 10 points each:

[10] Name this American architect, whose other designs include the East Wing of the National Gallery of Art and the John F. Kennedy Presidential Library.

ANSWER: Ieoh Ming **Pei**

[10] Another of Pei's buildings is this museum, located in Cleveland on the shores of Lake Erie. People honored in this museum include Prince, Bruce Springsteen, and Elton John.

ANSWER: **Rock and Roll Hall of Fame**

[10] Pei designed a pyramid made of this material for an entrance to the Louvre. Philip Johnson designed a house for himself in New Canaan, Connecticut named for this material, which is often made via "blowing."

ANSWER: **glass**

11. This philosopher originated a triad of developing an argument, which involves a thesis, and opposing antithesis, and then the reconciliation of the two via synthesis. For 10 points each:

[10] Name this Philosopher who emphasized geist, or spirit, and whose followers were identified as "young" proponents of him.

ANSWER: Georg Wilhelm Friedrich **Hegel**

[10] Hegel also theorized on this dramatic form, which he defined as arising from a conflict between two opposing forces of individuals. Writers of this genre include Aeschylus and Euripides.

ANSWER: **tragedy**

[10] Hegel hailed from what is now this country. Other philosophers from here include Immanuel Kant, who discussed the categorical imperatives in works like *Critique of Pure Reason*.

ANSWER: **Germany**

12. During any chromatography, this phenomenon can widen bands and make the result more difficult to see. For 10 points each:

[10] Identify this random walk process whereby molecules will move to spread themselves out in a defined region. It can be observed easily by dropping red food dye in water.

ANSWER: **diffusion**

[10] Molecules diffuse away from regions where this quantity towards regions where it is low. This quantity, often measured by molarity, indicates how many molecules of a particular substance are present in a mixture.

ANSWER: **concentration** (prompt on **c**)

[10] Effusion, a special type of diffusion of gas molecules, is dependent upon this quantity of the particles involved according to Graham's law.

ANSWER: molecular **mass**

13. This nightclub was holding a "Latin Night" when gunfire broke out in June 2016. For 10 points each:

[10] Name this gay-friendly nightclub that was scoped out by Omar Mateen Seddique before he shot and killed 49 people here while pledging allegiance to ISIS.

ANSWER: **Pulse**

[10] The Pulse Nightclub is located in the city of Orlando in this state, notably the location of a number of amusement parks such as Universal Studios and Walt Disney World.

ANSWER: **Florida**

[10] Seddique's family is originally from this Central Asian country. Seddique's father interviewed this country's current president, Asraf Ghani, for the seemingly-fake "Durand Line" news network.

ANSWER: **Afghanistan**

14. The protagonist of this fairy tale saves the life of a Prince whom she has fallen in love with watching his birthday party at sea. For 10 points each:

[10] Name this tale about an aquatic princess who desires to have legs.

ANSWER: **"The Little Mermaid"** (or **"Den lille havrue"**)

[10] This Danish Author wrote "The Little Mermaid." His other works include "The Emperor's New Clothes," in which the Emperor is tricked into nudity.

ANSWER: Hans Christian **Anderson**

[10] This Anderson tale is about a tiny girl, who has appropriate-sized adventures mingling with toads and fairies. She emerged from a planted barleycorn flower.

ANSWER: **"Thumbelina"**

15. In 1378, wool workers in this city rose in a rebellion against the oligarchy known as the Ciompi. For 10 points each:

[10] Name this city in Tuscany which is home to the Duomo. For much of its history, it was lead by the di Medici family. Niccolo Machiavelli's political career here inspired him to write the treatise *The Prince*.

ANSWER: **Florence** (or **Firenze**)

[10] This man's political career in Florence inspired him to write the treatise *The Prince*. His name is associated with political pragmatism, and he states "it is better to be feared than loved."

ANSWER: Niccolò **Machiavelli**

[10] Cosimo's grandson, the third Medici ruler, had this name. He was dubbed "the magnificent," and was a major patron of Da Vinci, Michelangelo, and Botticelli.

ANSWER: **Lorenzo**

16. Robert and Helen Lynd wrote an early work in this academic discipline, *Middletown*, which analyzed life in a typical American city. For 10 points each:

[10] Name this academic discipline whose modern school was founded in part by the French theorist Emile Durkheim and based on the work of Auguste Comte.

ANSWER: **sociology**

[10] Durkheim embarked on a major sociological study of this phenomenon, which he divided into four types. Its "egoistic" form occurs when social integration is low and individuals feel despondent and alone before committing this capital form of self-harm.

ANSWER: **suicide**

[10] Durkheim described mechanical and organic forms of this term, which helps explain how members of societies hang together. It has more also been used to demonstrate unity or fellowship between groups.

ANSWER: **solidarity**

17. Poetry has often been a feature at Presidential inaugurations. For 10 points each:

[10] This woman read her poem "On the Pulse of Morning" at Bill Clinton's inauguration in 1993. She is best known for memoirs such as *I Know Why the Caged Bird Sings*, discussing her childhood experiences.

ANSWER: Maya **Angelou** (or Marguerite Annie **Johnson**)

[10] This man read his "The Gift Outright" at John F. Kennedy's inauguration. He wrote "good fences make good neighbors" in his poem "The Mending Wall."

ANSWER: Robert Lee **Frost**

[10] "One Today", read by Richard Blanco at President Obama's 2013 inauguration, is written in this sort of meter. It contains 10 syllables, with even numbered ones being stressed.

ANSWER: **iambic pentameter**

18. This man's symphonic fanfare "Short Ride in a Fast Machine" is designed to evoke a ride in a sports car. For 10 points each:

[10] Name this American composer who pioneered "post-minimalism" in works like "Shaker Loops" and a tribute to the 9/11 victims "On the Transmigration of Souls." He shares his first and last name with two American Presidents.

ANSWER: John **Adams**

[10] Adams composed several of these works for voices and orchestra including the *Death of Klinghoffer*. One of these entitled *Nixon in China* begins with President Nixon singing an aria about “News.”

ANSWER: **opera**

[10] During *Nixon in China*, Madame and Chairman Mao perform this kind of smooth ballroom dance in 4/4 time. This dance was popularized by vaudeville performers in the 1910s.

ANSWER: **foxtrot**

19. This construct is made up of numbers called elements arranged into  $m$  rows and  $n$  columns. For 10 points each:

[10] Identify these arrays of numbers. Multiplying two of them requires the number of columns of the first one to equal the number of rows of the second one.

ANSWER: **matrix**

[10] Consider a two-by-two matrix has the top row elements  $a$  and  $b$  and the bottom row elements  $c$  and  $d$ . What is the expression of the determinant, in terms of  $a$ ,  $b$ ,  $c$  and  $d$ ?

ANSWER:  **$a$  times  $d$  minus  $b$  times  $c$**  (or  **$ad$  minus  $bc$** ; or obvious equivalents)

[10] This value equals the sum of the elements on the diagonal of a square matrix. For example, in the previous matrix, this value equals  $a$  plus  $d$ .

ANSWER: **trace**

20. This battle followed Alexander the Great’s victory at the Granicus River. For 10 points each:

[10] Name this first of two major victories for Alexander the Great over Darius III, which took place in 333 BCE. Darius fled inward after this battle, allowing Alexander to consolidate his conquests.

ANSWER: **Issus**

[10] Darius was the ruler of this Empire. It previously fought the Greeks at the battles of Marathon and Salamis, and had provinces that were governed by satraps.

ANSWER: **Persian** Empire (or **Achaemenid** Empire)

[10] Alexander’s forces encountered troops riding these tusked animals for the first time in India.

Hellenistic Greeks became fascinated with using these pachyderms in war, leading to a namesake “mania” in their militaries.

ANSWER: **elephants**

TB. This country’s Republic of Kalmykia, which has a Buddhist majority, contains a competitive chess complex called “Chess City.” For 10 points each,

[10] Name this country, the world’s largest by area, whose capital is Moscow.

ANSWER: **Russia**

[10] Russia’s European and Asian portions are traditionally divided by this low mountain range. These mountains extend northward into the islands of Novaya Zemlya in the Arctic Ocean.

ANSWER: **Ural** Mountains

[10] Russia also contains this longest river in Europe. It flows from its source north of St. Petersburg into the Caspian Sea, and Ilya Repin painted a depiction of barge haulers on it.

ANSWER: **Volga** River