

RTO 2015

Round 4 – Tossups

1. **One example of these, between the Tigris and Euphrates rivers, was constructed by the Sumerian king Shu-Sin for protection against the Amorites. Quebec and Campeche are the only two cities with them in North America. The Persians captured Babylon by making use of a gap in its example of these through which the Euphrates River flowed. The third-century (*) Aurelian ones surround Rome. As early as the ninety-fifth century BC, the village of Jericho had an example of these. For ten points, name this type of fortification, a "great" example of which was completed by the Ming in northern China.**

wall (accept city wall anywhere other than the first and last clue)

2. **This opera's final act begins with sailors singing "Oh eh! Oh eh!," followed by the song "Gia il sole!" when the male lead arrives. In Act I, the male lead sings "Amore o grillo," telling of his first encounter with the title character, who later fantasizes about her husband's return "when the robin makes his nest" in the aria (*) "Un bel di." Kate is introduced to the title character by Sharpless, after which the title character blindfolds her son Dolore and kills herself. FTP, name this opera about Pinkerton's doomed marriage with Cio-Cio San, written by Giacomo Puccini.**

Madame Butterfly

3. **One famous participant in this sport died after crashing into a concrete barrier, leading supervisors to make the sport much safer. One famous location of these sporting events is in Monza, Italy, and the most recent championship was held in Abu Dhabi, although a more famous event is at (*) Silverstone. The man who qualified first for the championship of this sport was Nico Rosberg, although his teammate Lewis Hamilton eventually won. FTP, name this sport with famous drivers such as Senna, James Hunt, and Nikki Lauda whose races are called Grands Prix (pree).**

Formula One or F-1

4. **One of this man's works is a ballet burlesque about three puppets who are brought to life during the 1830 Shrovetide Fair in St. Petersburg. In that ballet, the eponymous character falls in love with The Ballerina but The Ballerina rejects him because she loves The Moor. That ballet, (*) *Petrushka*, also carries its namesake chord which was popularized by this man which consists of a C major chord juxtaposed with a F sharp major chord. Another one of his ballets is about Prince Ivan asking for a blessing from Kashchei the Immortal to marry a princess. The eponymous creature saves Ivan by forcing all the other Immortal creatures to perform the Infernal Dance. FTP, name this composer of music who achieved international fame for his ballets including *The Firebird* and *The Rite of Spring*.**

Igor Fyodorovich Stravinsky

5. **A common name taken by Native Americans for dealing with Europeans, this name is shared by: John, the first to map the Chesapeake Bay Area and New England. Al, presidential nominee for the Democrats in 1928. Edward John, captain of the RMS *Titanic*. Matt, an English actor known for being the 11th (*) Doctor. Jaden, child actor, and son of the actor Will, who starred in movies such as "The Pursuit of Happyness" and "After Earth." FTP, give the surname shared by all the aforementioned people, and by Adam and Joseph, the author of "The Wealth of Nations" and the founder of the Mormons respectively.**

Smith

6. **In April 2012, it was discovered that large quantities of this element can be intercalated into bismuth selenide nanoribbons without disrupting the host lattice. This element is used as a catalyst in the Sandmeyer reaction, and is combined with zinc to catalyze the Simmons(*)-Smith reaction.** The most common method of extracting this element from ore involves separating it from iron and sulfur in chalcopyrite. When in its +1 oxidation state, an atom of this element has a filled 3d orbital and an empty 4s orbital. This element accumulates in the body in Wilson's disease. With zinc, this element forms brass, and with tin, it forms bronze. FTP, name this transition metal with atomic number 29 and symbol Cu.

Copper (accept Cu until mentioned)

7. **In Chinese mythology, Yu Shi was the god of this phenomenon. Aryong Jong was the goddess of this in Korean mythology. In Phoenecia, Baal brought this. For the Maya, the god of this was (*) Chaac. Indra was a god of this, as was Jaguar of Olmec mythology.** FTP, name this phenomenon, which the aforementioned gods would send to earth in order to nourish crops and prevent drought, but also to sometimes destroy at least parts of the world through horrible floods.

Rain

8. **In 2006, Civil War buffs fought off an effort to install gambling casinos near this battlefield. After this battle, Lincoln declared, "As it is, the war will be prolonged indefinitely." Three days before this Civil War battle, Lincoln replaced Major General (*) Hooker with General George Meade.** General Lee's attempts to scrape a victory were unsuccessful despite the Confederates almost breaking through the Union's left flank on the second day of the battle. FTP, name this 3-day, Civil War battle with the highest total number of casualties including fighting on such famed sites as Cemetery Ridge, the Peach Orchard, and Devil's Den.

Battle of Gettysburg

9. **NASA launched a replacement satellite in June 2014 to study this phenomenon after the original crashed in 2009. The United Nations will talk about this phenomenon in Paris in late 2015. President Barack Obama and President Xi Jinping of China made a deal to limit (*) carbon emissions in America and China to try to slow this phenomenon.** This phenomenon will likely cause increased plant growth because of increased precipitation and humidity and it is commonly associated with wildfires, droughts, and floods. FTP, name this phenomenon also caused by the Sun's radiation as well as carbon emissions from biotic factors, also incorrectly known as global warming.

Global Climate Change (prompt on global warming before mentioned)

10. **One candidate in this state's 2014 Senate Race was a former CEO of Pillowtex--the North Carolina fabrics company--and was in charge when Pillowtex went bankrupt and laid off almost four thousand people in one day. That candidate was also the CEO of Reebok when they negotiated the contract with the (*) NFL to reposition the company.** The other candidate from this state's Senate Race was Michelle Nunn. Nunn was heavily hurt in her campaign because her campaign strategies and recommendations were leaked to the public. FTP, name this state whose current senator, Saxby Chambliss, is retiring and being replaced by Republican David Perdue; it is also the Empire State of the South and the Peach State with capital at Atlanta.

Georgia

11. **This man participated in Dancing with the Stars in 2013 with Tyne Stecklein. He appeared in the educational segments of "Back to the Future: the Animated Series" as the assistant of Dr. Emmett Brown. In February of 2014, he debated (*) Creationism with Ken Ham. This man's most famous TV series includes the line "Inertia is a property of matter" in its theme song and includes segments such as "Consider the Following" and "Way Cool Scientist." For ten points, name this man, who's often called "the science guy."**

Bill Nye

12. **Elements of this group are monatomic when under standard conditions. The melting and boiling points for this group differ by less than 10 degrees Celsius. Applications for this group vary from lighting to welding and space exploration. Due to these elements' nature, we use one of them in (*) lightbulbs in order to prevent the hot tungsten filament from oxidizing. These elements were once known as rare, but that was proven to be false. FTP, name these elements that, except one, all have eight valence electrons.**

Noble Gases

13. **The protagonist of this poem fails a challenge to stay awake for a week, and is shown one loaf of bread for each day he slept. He passes along the Road of the Sun after passing two scorpion men, and after traveling for twelve leagues, the protagonist arrives at the Garden of the Gods. The protagonist of this poem befriends a "wild man" who nearly defeated him in a wrestling match. That character is later killed after slaying the (*) "Bull of Heaven" and throwing part of it at the goddess Ishtar. The most complete version of this poem was recovered from the library of Ashurbanipal. For ten points, name this poem in which Humbaba is killed by Enkidu and a namesake king of Uruk.**

Epic of Gilgamesh

14. **It was recently theorized from the analysis of DNA taken from skeletons found in London that one strain of this disease's pathogen may have been airborne; this theory accounts for the speed of its spread. Reservoir species for its pathogen include marmots in Central Asia, and it causes colony collapse in prairie dogs. Though it is unattested in (*) 14th-century China, it may help account for the fact that China's population fell by forty million during that period. *Yersinia pestis*, which causes this disease, forms a biofilm in insects that prevents the host from feeding, and spreads when the host bites a human. Characterized by internal bleeding, gangrene and necrosis of the lips, nose, and hands, vomiting of blood, and namesake swellings of the armpits and groin, for ten points, name this disease that killed something like a third of the population of the Middle East and Europe during the 1300s.**

Bubonic plague or Black plague or Black Death; accept *Yersinia pestis* before mention

15. **This math concept can be pithily defined using the Kronecker delta function. It is sometimes abbreviated E due to the German word for this concept, *Einheitsmatrix* (eye-heights-matrix). It is the only idempotent matrix that has linearly independent rows and columns. In quantum mechanics, this matrix is often denoted by a boldface (*) numeral one. If the size is immaterial, this diagonal matrix is called I. This square matrix is the product of a matrix times its reciprocal. When multiplied by a matrix A of the same dimensions, it will always return the same matrix A. For ten points, name this square matrix with ones on the main diagonal and zeroes everywhere else.**

Identity Matrix

16. **In this novel, after the character Frances dies in childbirth, her son Hareton is mistreated by his alcoholic guardian, Hindley. Hindley also once mistreated one of the principal characters of the book, turning him into an illiterate farm boy. Other characters in this novel include (*) Catherine, young Catherine, and a cruel man whose past prompts him to spend the rest of his life seeking revenge by acquiring a namesake estate, Heathcliff. FTP name this novel whose narrator Mr. Lockwood is told the story of Heathcliff by his maid Nelly Dean, by Emily Bronte.**

Wuthering Heights

17. **In one religion, this represents behaviors that follow rta, the order that makes the universe and life possible, and the "right way of living." In another religion, this is considered the "cosmic law and order," while still another states that it is the "path of righteousness." This concept is present in the Indian belief systems (*) Hinduism, Jainism, Sikhism, and Buddhism, and does not have a definite translation into Western languages. Examples of some of its meanings include yoga, virtues like ahimsa, and law and justice. Name this general key concept in Sanskrit that can represent doctrine, philosophy, or moral law, depending on the religion.**

Dharma

18. **This work was both based on and dedicated to Miss Arabella Fermor. A gnome named Umbriel journeys to the Cave of the Spleen and receives a bag of "sighs, sobs, and passions." One character decides to commit a "dire offense" as he watches a woman go to Hampton Court. In this epic, Ariel serves as the chief of the sylphs, who are responsible for watching over (*) Belinda. At the end of this work the titular object, which had been cut off earlier by the Baron, is discovered to be completely lost. For ten points, name this satirical epic poem by Alexander Pope.**

The Rape of the Lock

19. **One novel written by this author was a response to the themes in "Crime and Punishment," since he supposedly detested Dostoevsky. This man wrote about Captain MacWhir saving his steamer Nan-Shan in the novel (*) "Typhoon." In another of this man's novels, Gentleman Brown and Cornelius form a conspiracy against Jim. This Polish man's notable works include "The Lagoon," "The Secret Agent," and "Lord Jim." FTP, name this author who created Marlow in "Heart of Darkness."**

Joseph Conrad

20. **In these organisms, the trochanter–prefemur joint is fixed and the embryonic cuticle on the second maxilliped always has an egg tooth. Unlike Pauropoda and Symphyla, other classes in their subphylum, they lose water rapidly through their skin. The order Scutigleromorpha designates the (*) "house" type of these animals, which consists of fifteen segments, each bearing a single pair of legs. For ten points, give the common name of these arthropod predators in the class Chilopoda inaccurately thought to have a hundred legs.**

Centipedes

21. **The main character in this film is compared to the protagonist in the movie *Leaving Las Vegas* by Dr. Daryl Isaacs. In this film, the main character's girlfriend, Alexandra, is ironically a vegan chef. The title of this film comes from an already-phased-out option in the (*) McDonald's menu that allows people to almost double their amount of food. For ten points, name this American documentary that follows a 30 day period in which the main character Morgan Spurlock only eats McDonald's food.**

Super Size Me

Bonuses – Round 4

1. For ten points each, answer these questions about getting to other planets.

- A. The first man-made probes to reach another planet were the Russian *Venera* probes, which visited this rocky planet. Conditions on the surface of this planet are really crazy, and destroyed the probes well within half an hour of their landing.

Venus

- B. This NASA probe recently began its encounter with Pluto. As of yet, it has nothing to show for it but a distant, blurry picture, but its closest encounter won't be until this summer.

New Horizons

- C. To get a rocket from one orbit to a higher or lower one, this technique can be used, in which one burn either raises or lowers the opposite side of the orbit. When the spacecraft reaches that point, another burn circularizes the orbit.

Hohmann transfer orbit

2. FTPE, name these pieces of music in 5/4 (five-four) time:

- A. This famous Lalo Shifrin theme song in the key of B flat major is from a movie series whose latest movie was *Ghost Protocol*.

Mission: Impossible Theme

- B. This orchestral suite uses 5/4 time in the movements *Mars*, *The Bringer of War* and *Neptune, the Mystic*.

The Planets

- C. The second movement of this symphony is said to be a limping waltz because it is in 5/4 time. This symphony may have been its composer's "transparent suicide note," though doctors say he died of cholera from drinking unboiled water.

Symphony Pathétique (accept Tchaikovsky's Symphony No. 6 in B minor, Op. 74 or anything about Tchaikovsky's Sixth Symphony)

3. FTPE, name these Constitutional Amendments.

- A. This amendment established the right of people to be secure of illegal searches and seizures.

4th Amendment

- B. This amendment, ratified after the election of Thomas Jefferson, ensured that electors would vote separately for president and vice president

12th Amendment

- C. This amendment extended the right to vote for the presidency to people residing in the District of Columbia.

23rd Amendment

4. Given the name of its capital, FTPE, name the Canadian province.

A. Regina

Saskatchewan

- B. Fredericton

New Brunswick

- C. Edmonton

Alberta

5. FTPE, answer these questions about Republican gaffes in the 2012 election.

- A. This runner-up to Romney in the Republican primaries messed up by insulting McCain's knowledge of torture.

Rick **Santorum**

- B. This other candidate for the Republican nomination was ridiculed when he said he would build a moon colony by 2020.

Newt **Gingrich**

- C. This former Missouri representative lost his job after his famous "legitimate rape" gaffe. Republicans tried to get him to withdraw from the election, but he refused.

Todd **Akin**

6. FTPE, give the name used to indicate each of these letters in the NATO phonetic alphabet.

A. C

Charlie

- B. F

Foxtrot

- C. V

Victor

7. Answer these questions about writers and cats.

- A. This American Nobel-prize winning author owned several polydactyl cats or cats with extra toes. After his suicide, his Key West home became a home for the descendants of his cats of whom there are so many that polydactyl cats are sometimes referred to by his name.

Ernest **Hemingway**

- B. Name this writer and founding member of the Algonquin Round Table who was noted for such witticisms as "Men seldom make passes at girls who wear glasses" or "Katharine Hepburn delivered a striking performance that ran the gamut of emotions from A to B." She is credited with having invented the phrase "scaredy-cat."

Dorothy **Parker**

- C. Name this author of a famed 17th century diary which depicted such events in English history such as the Great Fire of London and the restoration of Charles II to the throne. He is thought to have been the first to use the word "catcall" and also the first to have used the word "frighten."

Samuel **Pepys** (pronounced Peeps)

8. FTPE, name these things about the basics of physics
- A. These are the only elementary particles in the Standard model of particle physics to experience all four fundamental interactions. They come in six flavors.

Quarks

- B. Two up quarks and one down quark form one of these particles.

Proton

- C. The quark model was independently proposed by two physicists. Name either of them.

Murray Gell-Mann or **George Zweig**

9. FTPE Answer these questions about *The Count of Monte Cristo*.

- A. This author of *The Count of Monte Cristo* also wrote *The Three Musketeers*.

Alexandre **Dumas**

- B. Name this character who was arrested on the day he was to wed Mercedes.

Edmond Dantes (accept either)

- C. Name this character who betrays Ali Pasha's family.

Ferdinand Mondego

10. FTPE, name these early kings of England.

- A. This man issued an Edict of Expulsion expelling all Jews from England. He would conquer Wales, and also launched a major war against Scotland, which would end after his death and prove unsuccessful.

Edward the First (or **Edward Longshanks**)

- B. This man launched a coup against his mother's consort, Roger Mortimer, in order to come to power. He launched what would become the Hundred Years War against France and was able to make huge gains.

Edward III (regnal number required)

- C. This man, known as the lion-hearted, campaigned against Saladin in the Third Crusade.

Richard I (regnal number required)

11. For ten points each, name these Freudian concepts.

- A. This denotes the emotions in the unconscious that concentrates upon on a child's desire to have sexual relations with their mother or father; the name is derived from a Sophoclean character.

Oedipus Complex

- B. These are the elements of a dream that we remember upon waking. Freud suggested that these serve to disguise the unconscious wishes of the dreamer

Manifest Content

- C. This is when something is familiar but also distant and alien at the same time. It often creates cognitive dissonance in the experiencing subject.

The **Uncanny**

12. FTPE, name the charges of these common ions

- A. Ammonium

1+ or **±**

- B. Oxalate

2-

- C. Arsenate

3-

13. FTPE answer these questions about the genetic material in your body.

- A. The genetic instructions used in the development and functioning of all known living organisms are encoded in this nucleic acid.

DNA

- B. DNA replication is referred to as this type of replication. It means that the DNA uses one of its pre-existing strands to construct copies of itself.

Semi-Conservative Replication

- C. This enzyme helps with DNA replication by separating the two strands to allow for the addition of nucleotides.

Helicase

14. For ten points each, answer these questions about cellular metabolism.

- A. This set of metabolic reactions allows cells to release energy gradually in the form of energy-rich carrier molecules in steps such as the Krebs Cycle, using oxygen in the process.

Aerobic respiration (prompt on **respiration**, do not accept "anaerobic respiration")

- B. Although oxygen is an important reactant in cellular respiration, its sole purpose in respiration is during the electron transport chain, where it acts as this.

Final electron acceptor

- C. 2 ATP are produced for each molecule of pyruvate in the citric acid cycle. However, ATP is not the initial product produced; this other molecule is directly produced and then gets converted into ATP.

GTP (guanosine triphosphate)

15. A lot of you people's lives revolve around studying for these tests. For ten points each, answer these questions about AP exams.

- A. In 2014, this AP exam had the lowest number of people scoring a 5. If you were one of the unfortunate souls that took this test, you would know that the DBQ was on Mao Zedong's appeal to peasants.

AP World History

- B. Advanced Placement is a program in the United States created by this private company that also publishes the SAT and the PSAT.

College Board

- C. For the 2014-2015 year, this AP exam was split into its 1 and 2 components.

AP Physics B

16. FTPE Answer these questions about money.

- A. This country located in Asia uses the renminbi as its main currency.

China

B. This country located in Eurasia uses the ruble as its main currency.

Russia

C. This country located mostly in Asia uses the Lira as its main currency.

Turkey

17. FTPE, answer these questions about derivatives in physics.

A. Torque is the time derivative of this quantity. Its conservation is described in Kepler's second law.

Angular momentum

B. The time derivative of this quantity is equal to induced electromotive force according to Faraday's law of induction. It is commonly applied in generators.

Magnetic flux

C. While force is the time derivative of momentum, it is also the derivative with respect to position of this quantity.

Work

18. For ten points each, answer these questions about Reconstruction in US history.

A. After Lincoln died, this vice president of his, a Democrat, faced conflict in Congress that eventually led to his impeachment.

Andrew Johnson

B. Johnson urged the states not to ratify this amendment that declared citizenship to "all persons born or naturalized in the United States."

14th amendment

C. This former governor of New York was the Democratic candidate in the election of 1868.

Horatio **Seymour**

19. For ten points each, name these hypothetical objects.

A. These objects lack a distinct north and south end, and have a net "magnetic" charge.

Magnetic **Monopoles**

B. As theorized by general relativity, this is a region of spacetime which cannot be entered from outside, though matter can escape from it. It is the reverse of black holes, as the name suggests.

White Hole

- C. These supposedly most dense stars are theorized to form inside of neutron stars. They are made of strange matter, though they are not strangelets.

Quark Star

20. FTPE, answer these question about a statistical test.

- A. This test determines if the results of an experiment contradict the expected values. Its value is calculated from the squares of the differences between the expected values and those observed in the experiment.

Chi squared test

- B. This type of hypothesis says that there is no relationship between two phenomena.

Null hypothesis

- C. This operation is done to each of the values in a chi squared analysis. It is denoted by the capital Greek letter sigma.

summing (or adding them up or obvious equivalents)

21. For ten points each, name the Pokémon that are most related to the given animals or objects.

- A. The entire evolutionary line of this Pokémon are turtles and this last evolution received a mega evolution in Generation 6. It is a Water-type.

Blastoise

- B. This fossil pokemon is based on a pterosaur, and is a strong Rock-type that picked off Ash in episode 30.

Aerodactyl

- C. This fifth-gen pokemon that is based on ice cream is considered to be the downfall of the fifth generation along with Garbodor. Its pre-evolutions are Vanillish and Vanillite.

Vanilluxe