

TOSSUP 1

First described in 1872, more than 200,000 Americans today are at risk of developing this disease. Currently, there is no cure or treatment that can stop or even slow its progression. Only one parent needs to provide an allele for the child to inherit the disease. It is caused by a cytosine-adenine-guanosine repeat in its namesake gene. Patients of the disease must consume twice the average number of calories to retain a stable body weight. FTP, name this neurodegenerative disorder characterized by uncontrollable, jerky movements, lack of coordination, inhibited cognitive function, depression, anxiety, and eventual death.

Huntington's disease

BONUS 1

FTPE name these other neurodegenerative diseases.

- 10: This is the most common type of dementia and is famously characterized in early stages by loss of short term memory.

Alzheimer's disease

- 10: The most visible symptoms of this disease are the involuntary tremors and slow, stiff movements.

Parkinson's disease

- 10: It is believed to be an autoimmune disease, caused by the body's immune system attacking its own myelin tissue.

Multiple sclerosis or MS

TOSSUP 2

Pencil and paper ready. On a planet where acceleration due to gravity is 10 meters per second squared, Paco throws a ball upward from the ground with an initial velocity of 20 meters per second. Ignoring air resistance, Paco wants to figure out the maximum height reached by the ball. Paco starts setting up kinematic equations, until he realizes that he can calculate the maximum height using the conservation of mechanical energy, since the ball has zero velocity at its maximum height. FTP, what is the maximum height reached by the ball?

40 meters

BONUS 2

An ideal spring with spring constant k compressed by a length x has a potential energy of U . FTPE, what is the potential energy in terms of U if...

- 10: k is halved?
 $\frac{U}{2}$

- 10: x is doubled?
 $4U$

- 10: k is tripled and x is halved?
 $\frac{3}{4}U$

TOSSUP 3

The protagonist's last name is not revealed until it appears on a sign on a friend's house in San Francisco instructing him to enter through a window if nobody is home. The friend gets him a job as a guard, prompting him to wonder what his other friends Old Bull Lee and Carlo Marx would think of him as a cop. Eventually he grows tired of San Francisco and makes his way back to New Jersey, where his life slows down for a while after he learns that he arrived two days after Dean Moriarty left. FTP, name this Beat novel about the adventures of Sal Paradise by Jack Kerouac.

On the Road

BONUS 3

FTPE, name these Beat Generation writers.

- 10: He is best known for his poem "Howl," which, along with On the Road, is considered one of the principal works of the Beat Generation.

Allen Ginsberg

- 10: His Naked Lunch is a collection of short scenes with recurring characters.

William Seward Burroughs II

- 10: This poet co-founded the City Lights Bookstore with Peter D. Martin in 1953.

Lawrence Ferlinghetti

TOSSUP 4

Although he attended school for only eight years, he read a lot and was greatly influenced by the ideas of supporters of non-violence such as Mahatma Gandhi. He led his workers on marches for better pay and conditions, carrying cloth banners with the Spanish words "Viva la Causa," or "Long Live the Cause." He created a new strike method called a boycott in which people refused to buy products from companies accused of treating farm workers badly and formed the first farmers' union in 1962. FTP, name the founder of the union which later became the United Farm Workers of America.

Cesar Chavez

BONUS 4

FTPE, name these labor leaders:

- 10: He helped create the AFL, or American Federation of Labor, in the late 1880s, and led the organization for all but one year until his death in 1924.

Samuel Gompers

- 10: In 1935, he formed the CIO, or Congress of Industrial Organizations, within the AFL.

John L. Lewis

- 10: He is best known as being the leader of the Teamsters before he was murdered.

Jimmy Hoffa

TOSSUP 5

It is able to withstand waters with high toxicity, but this has made its skin extremely hard and as such it is not edible. Because it is not a good swimmer, it is often found near the ocean floor below the depths at which currents can affect it. However, it is sometimes swept up in currents and washed ashore. It can be bought before entering Mount Moon, or it can be caught in any body of water with the Old Rod. FTP, name this fish Pokemon that evolves into Gyrados at level twenty.

Magikarp

BONUS 5

FTPE, name these other water-type Pokemon.

- 10: A starter choice in Pokemon Red and Blue versions, its name reflects its resemblance to a turtle.

Squirtle

- 10: A short yellow Pokemon, its psychic abilities are strengthened when its headache becomes worse.

Psyduck

- 10: Also a rock-type, it can be obtained in Red and Blue versions by cloning the Helix Fossil.

Omanyte

TOSSUP 6

First performed in 1867 at a concert given by the Vienna Men's Choral Association, this piece was later adapted as an orchestral version for the World's Fair in Paris. Stanley Kubrick featured it prominently in spaceship docking scenes in "2001: A Space Odyssey". FTP, name this most famous waltz of Johann Strauss the Younger, the German name of which is "An der schen blauen Donau".

On The Beautiful Blue Danube (Accept Blue Danube Waltz)

BONUS 6

BONUS FTPE Name these pieces by a Strauss.

- 10: Also used in "2001" was the introduction of this Richard Strauss symphonic poem, named after a work by Nietzsche.

Also Sprach Zarathustra

- 10: This march by Johann Strauss the Elder was dedicated to an Austrian Field Marshal.

Radetzky March

- 10: This comedic operetta by Strauss the Younger gets its name from the German for “the bat”.

Die Fledermaus

TOSSUP 7

He was the namesake of a famous club in one of Arthur Conan Doyle’s Sherlock Holmes tales. Born in modern day Turkey, he was exiled at a young age due to his father’s crime. Living in Athens, he quickly gained a reputation as a sarcastic ascetic. He was captured by pirates and sold to a Corinthian in Crete, and became the tutor to his captor’s sons; from that point onwards he lived in Corinth. FTP, name this famous Cynic, who is said to have walked the streets with a lantern at night searching for an honest man.

Diogenes (of Sinope)

BONUS 7

FTPE, name these other Cynics of classical antiquity.

- 10: The teacher of Diogenes, he was the original Cynic.

Antisthenes

- 10: A student of Diogenes, he is chiefly remembered as the former of the link between the Cynics and the Stoics; most of his writings are lost.

Crates (of Thebes)

- 10: A student of Crates of Thebes, he was not only a Cynic, but one of the early founders of Stoicism. He shares his name with a mathematician famous for his paradoxes.

Zeno of Citium (prompt on Zeno)

TOSSUP 8

The first paper mill in the Islamic world was founded in this city. Captured by Alexander the Great in 329 BC, it was the capital of the ancient region of Sogdiana. Tamerlane made it the capital of his conquered empire. FTP, name this third largest city of Uzbekistan and former capital until it was replaced by Tashkent in 1930.

Samarkand

BONUS 8

BONUS Name these cities that have all claimed to be “The Oldest City In The World”

- 10: Archaeologists have found evidence indicating that this city could have been inhabited in 8000 BCE. It also houses the Umayyad Mosque.

Damascus

- 10: This most holy city of Hinduism is the location for the shrine of Lord Kashi, another name for Shiva. It is situated on the banks of the Ganges River.

Varanasi

- 10: This capital of the Kurdistan Regional Government was also a center for worshipping Ishtar.

Arbil

TOSSUP 9

In first order reactions it is independent of the initial concentration of the reactant and is equal to the natural logarithm of two divided by the rate constant for the reaction. For second order reactions it is equal to one divided by the product of the initial concentration of the reactant and the rate constant. It can be used to find the amount of a decaying substance remaining by raising two to the elapsed time divided by it times negative one and then multiplying the result by the initial amount of the substance. FTPE, name this value, the amount of time that must elapse before fifty percent of a substance has reacted or decayed.

half-life

BONUS 9

Answer these questions related to radiocarbon dating FTPE.

- 10: Which isotope of Carbon is used?

Carbon-14

- 10: Name any number in the range of years during which the radioactivity of the Carbon-14 becomes indistinguishable from background radiation.

58,000 to 60,000 years (accept any in range)

- 10: Radiocarbon dating was developed by this professor at the University of Chicago in 1949.

Willard Frank Libby

TOSSUP 10

At over 900 feet high, it was the tallest structure in the world at the time it was built. It held this title for 41 years until 1930, when the Chrysler Building in New York was completed. Consisting of 18,038 pieces of puddled iron, it was built for the 1889 World's Fair celebrating the centennial of the French Revolution. FTPE, identify this landmark of Paris, named for its designer.

Eiffel Tower

BONUS 10

FTPE, name these superlative skyscrapers of the world.

- 10: This pair of towers is located in Kuala Lumpur, Malaysia and were the tallest in the world from 1998 to 2004.

Petronas Towers

- 10: Completed in 2004 in Taiwan, this building is currently the world's tallest.

Taipei 101

- 10: The height of this building is being kept secret, but it will be the tallest in the world when it is completed in its namesake city in 2008.

Burj Dubai

TOSSUP 11

Von Below's Fourth Corps' movement on the French right in the afternoon forced the enemy to commit the reserve of the Young Guard before it could be used to break through the Allied line. The Old Guard would then be used up in a suicidal charge that managed to take a farmhouse, La Haye Sainte, before burning out and precipitating an ignominious French retreat. FTP name this final defeat of Napoleon at the hands of Generals Blecher and Wellington.

Battle of Waterloo

BONUS 11

FTPE name these other battles of the Napoleonic Wars.

- 10: This tactical masterpiece on December 5, 1805 is considered Napoleon's greatest victory; it is also seen in the Tolstoy novel War and Peace.

Battle of Austerlitz

- 10: Not long before Austerlitz, a Franco-Spanish fleet under Admiral Villeneuve was defeated off the Spanish coast by Admiral Lord Horatio Nelson at this battle.

Battle of Trafalgar

- 10: The next year, Napoleon would crush a numerically inferior Prussian army at this battle, unaware that further north, his marshal Davout was destroying a vastly larger Prussian force.

Battle of Jena-Auerstedt

TOSSUP 12

He lived a remarkably mundane life, marrying a poor spectacle-maker's daughter and working as lawyer for the Hartford Insurance Company, specializing in surety bonds. While he often wrote of exotic places and collected foreign art and gourmet foods, he never left North America. In some of his most famous poems, he described "The Man with the Blue Guitar," "Thirteen Ways of Looking at a Blackbird," and "The Emperor of Ice Cream." FTP name this twentieth-century American poet.

Wallace Stevens.

BONUS 12

FTPE identify these other twentieth-century American poets from the lines they wrote.

- 10: "April is the cruellest month"

Thomas Stearns Eliot.

- 10: "I have eaten the plums that were in the icebox"

William Carlos Williams.

- 10: "What happens to a dream deferred?"
Langston Hughes

TOSSUP 13

The individuals depicted in it include the artist's future wife, holding a small dog; the restaurant's owner, leaning against a railing; and other friends of the artist. The table holds up bottles of wine and piles of fruit, and the sails of small craft are visible on the river. FTP, identify this painting of some young people eating at a riverside restaurant by Pierre Auguste Renoir.

The Luncheon of the Boating Party

BONUS 13

Identify these Impressionists from more obscure works FTPE, or for five points if you need a more famous work.

- 10: Olympia
- 5: Luncheon on the Grass
Edouard Manet
- 10: At the Stock Exchange
- 5: The Dance Class
Edgar Degas
- 10: Autumn Effect at Argenteuil
- 5: Water Lily Pond
Claude Monet

TOSSUP 14

Pencil and paper ready. Fred is given the function $y = \sin(x)$ by his math teacher. His math teacher asks him to find the 1202nd derivative of y with respect to x . He is scared until he remembers that 4th derivative of sine of x is sine of x . FTP, what is the 1202nd derivative of $\sin(x)$?

A: $-\sin(x)$

BONUS 14

Compute these other derivatives FTPE

- 10: 3rd derivative of cosine of x with respect to x
sine of x
- 10: 2nd derivative of x^2 .
2
- 10: 4 billionth derivative of e^x .
 e^x

TOSSUP 15

An example of this phenomenon is the English word "starve", derived from the Old English "steorfan", meaning "to die", which was subsequently derived from the Indo-European "ster-", meaning "stiff or rigid". The English word came to mean "to kill with hunger" in the 15th century, to its current definition of "to suffer from hunger". The modern German "sterben", a cognate of "starve", still retains the original meaning of "to die". For ten points, name this linguistics term indicating a complete change in the original meaning of a word.

Semantic drift

BONUS 15

For ten points each, name these other semantic changes.

10: A word changes from a negative to positive connotation.

Amelioration

10: A word changes from a positive to negative connotation.

Pejoration

10: A word gains a broader set of definitions.

Extension

TOSSUP 16

The opposing forces, controlling 20 infantry battalions supported by over fifty pieces of artillery, were commanded by Pavel Liprandi. Lord Raglan issued the orders through his aide, Captain Louis Nolan; later investigation into this incident were made difficult due to Nolan's death during the action. Lord Cardigan ended up advancing either 673 or 661 troopers between the Fedyukhin Heights and the Causeway Heights, who were forced to retreat ignominiously following a heavy barrage by Liprandi's cannon. FTP name this action of the Battle of Balaklava during the Crimean War, immortalized in a poem by Alfred, Lord Tennyson.

The Charge of the Light Brigade (accept Battle of Balaklava before

BONUS 16

"Balaklava")

10: Tennyson's best-known poem, it is about the unrequited love the title character has for Sir Lancelot, and her subsequent death by freezing.

The Lady of Shalott

10: One of his longer poems, it includes the line "'Tis better to have loved and lost/Than never to have loved at all".

In Memoriam A.H.H.

10: One of Tennyson's earliest poems, it speaks of a massive sea monster.

The Kraken

TOSSUP 17

The Rutuli, determined to have their king marry a Latin princess, gather an alliance of Italian tribes to fight the other suitor's army. Many heroes on both sides are killed in the ensuing battle, including Pallas, Prince of Tuscany; Mezentius, friend of the Rutuli king Turnus; and Camilla, an Amazon. However, in the end, the eponymous hero kills Turnus; his marriage to Lavinia occurs after the end of the poem. FTP name this poem, written by Virgil about the exploits of a formerly Trojan prince.

The Aeneid

BONUS 17

FTPE name these other works by or relating to Publius Vergilius (wear-GIL-ee-us) Maro.

- 10: It is Virgil's treatise on rural life and farming, and contains many digressions involving Octavian.

The Georgics (accept On Farming)

- 10: It predicts the birth of a boy savior in the fourth part. Many Christians later saw this as a Messianic prophecy.

The Eclogues (accept Bucolics)

- 10: During the Middle Ages, lines of Virgil were taken at random by Christians and interpreted in the context of the current situation, similarly to this Chinese text.

I Ching (accept all of the variants for that name)

TOSSUP 18

English geologist John Michell introduced the concept of them in 1784, and ideas of their existence were put forward by notable physicists of the 1930s. They were detected by the huge amount of X-ray and ultraviolet radiation they emit and because of the jets moving along the axis of the disk. FTP, name these massive objects with such a powerful gravitational field that, once something passes the event horizon, it cannot escape.

Black holes

BONUS 18

FTPE, identify these other things about the life of a star.

- 10: This forms around a black hole and is made up of material being sucked towards the event horizon.

Accretion Disk

- 10: Instead of forming a black hole, a star may become this if it has insufficient mass.

Neutron Star

- 10: A small to medium-sized star may become this after consuming all its available hydrogen.

White Dwarf

TOSSUP 19

Solutions to this class of problem can always be verified in polynomial time, but no polynomial-time algorithm has been found for any problem in this class. Famous example problems include subset sum and the traveling salesman problem. FTP, identify this class of problems, which can be solved in polynomial time on non-deterministic Turing machines and may or may not equal P.

NP-complete

BONUS 19

Identify the big-O performance of these computing tasks FTPE.

10: Finding an element with binary search in a sorted list
 $O(\log n)$

10: Summing an array
 $O(n)$

10: Insertion into a binary search tree.
 $O(\log n)$

TOSSUP 20

He had a brief stint in the military, punctuated by punishments for reading liberal texts and small-scale insubordination. In 1847, he became a political journalist with a Piedmontese newspaper, and in the next two years rose to a position on the Chamber of Deputies and just as quickly fell after the defeat of Novara. Three years after that, he became Prime Minister, and struck deals with Napoleon III for assistance against Austria, leading to the events of 1860, after which he died. FTP name this first Prime Minister of the Kingdom of Italy.

Camillo Benso, conte di Cavour

BONUS 20

FTPE name these people associated with the Risorgimento, or unification of Italy.

10: Called the "Hero of Two Worlds" for his exploits both in South America and in Europe, he was the leader of the Redshirts and the conqueror of the Kingdom of Two Sicilies in 1860.
Giuseppe Garibaldi

10: He was originally King of Piedmont until 1861, when he became the first King of Italy.
Victor Emmanuel II (accept Vittorio Emanuele II, prompt on Victor Emmanuel)

10: An important Carbonari and political philosopher, he was the leader of the Roman Republic of the Revolutions of 1848.
Giuseppe Mazzini