



1. A complex of exhibits is found on this city's Museum Island; the most famous of those museums houses a reconstruction of the Pergamum Altar. A television tower with a stainless steel dome, known as the Fernsehturm, stands near a public square in this city known as Alexanderplatz. The river Spree flows through this city, home to a quadriga chariot that sits atop a massive triumphal arch. For 10 points, name this European capital, home to the Brandenburg Gate.

ANSWER: Berlin

020-13-93-04101

2. The derivative of this quantity with respect to time gives the current. Flux through a Gaussian surface can be found by totalling the amount of this quantity it encloses. A particle moving orthogonal to a magnetic field will only be affected if it has a non-zero value for this quantity. Pith balls are often used to demonstrate attraction or repulsion due to this quantity. For 10 points, identify this quantity measured in Coulombs, which comes in positive and negative varieties.

ANSWER: electric charge

233-13-93-04102

3. A nineteenth-century queen of this country converted to Bahai. Prior to World War II, this country was home to the Legion of Archangel Michael, which became this country's Iron Guard. A leader of this country fell after attempting to evict Lazlo Tokes and issued the July Theses. For 10 points, name this eastern European country that was governed by Nicolas Ceausescu from Budapest.

ANSWER: Romania

149-13-93-04103

4. For pure substance, the natural log of this quantity at T-sub-two over it at T-sub-one is related to enthalpy of vaporization over gas constant times quantity one over T-sub-one minus one over T-sub-two by the Clausius-Clapeyron equation. For an ideal mixture, this quantity is the sum of it for the individual components multiplied by their mole fraction, according to Raoult's law. This quantity equals the atmospheric pressure at the boiling point. For 10 points, identify this pressure exerted by a substance in a gas phase above a liquid or solid phase.

ANSWER: equilibrium vapor pressure

066-13-93-04104

5. This speech was called a "powerful demagogic" speech by the head of COINTELPRO. The speaker of this speech ends by saying that he hopes everyone can sing "Free at last! Free at last!" The speaker hopes that his children will live in a nation "where they will not be judged by the color of their skin, but by the content of their character." For 10 points, name this August 1963 speech delivered by Martin Luther King Jr. during the March on Washington.

ANSWER: "I Have a Dream"

052-13-93-04105

6. This character is charged with treason shortly after refusing to conquer Blefuscu. When last seen, he is horrified by his family and ends up spending much time in stables after living among super-intelligent horses and the brutish “Yahoos.” This man visits such lands as Brobdingnag and Lilliput, which consist of giants and very short people, respectively. For 10 points, name this Jonathan Swift created character, a ship’s doctor who ends up traveling through many bizarre lands.

ANSWER: Lemuel **Gulliver** [or **Lemuel**]

052-13-93-04106

7. If a function is in an L_p space, then this operation on the p -th power of its absolute value gives a non-infinite result. The Newton-Cotes formula gives a method for performing this operation numerically. Fubini's theorem allows one to reverse the order of a double one. Riemann sums provide one method of deriving it. For 10 points, name this mathematical operation that is the antiderivative according to the fundamental theorem of calculus and which also gives the area under curves.

ANSWER: Riemannian **integral**

127-13-93-04107

8. This character is instructed about “crabs” and “feathers” while rowing a boat with an egg-selling sheep. In another work, she serves as a witness in a trial in which the Knave of Hearts is accused of stealing some tarts. This protagonist of *Through the Looking Glass* is also featured in another novel in which she has a tea party with the March Hare and meets the Cheshire Cat and the White Rabbit. For 10 points, name this Lewis Carroll character who has adventures in Wonderland.

ANSWER: **Alice**

015-13-93-04108

9. One of this two-lobed organ's functions is the conversion of excess glucose into glycogen for energy storage. It produces cholesterol, proteins and bile in addition to its function regulating blood clotting. Fibrosis of this organ, usually due to excessive alcohol consumption, is called cirrhosis. It converts ammonia into urea, utilizing blood it obtains from the hepatic artery. For 10 points, name this organ capable of regenerating itself.

ANSWER: **liver**

147-13-93-04109

10. This man served as music director of the St. Thomas Choir in Leipzig for twenty-seven years until his death. The piece "Jesu, Joy of Man's Desiring" was excerpted from one of the over 200 cantatas that he composed. He wrote a book of preludes and fugues in all 24 major and minor keys, and composed a set of six Baroque concertos as a job application for a German margrave. For 10 points, name this German composer of *The Well-Tempered Clavier* and the *Brandenburg Concertos*, the first of the three "B"s.

ANSWER: **J. S. Bach** [or **Johann Sebastian Bach**; prompt on **Bach**; prompt on **J. Bach**; prompt on **Johann Bach**]

130-13-93-04110

11. This location is home to the Very Large Telescope. Animals that survive here include Darwin’s leaf-eared mouse and some Humboldt Penguins. This desert has a region south of Antofagasta which resembles Martian soil. It was once home to the world’s largest supply of sodium nitrate, but now features numerous abandoned “saltpeter” mining towns. This desert typically gets about fifteen millimeters of rain a year. For 10 points, name this South American desert, the driest in the world.

ANSWER: **Atacama** Desert [prompt on **Chile**]

052-13-93-04111

12. Instead of copper, this element is used for overhead power lines due to its lower density. All feldspars contain an atom of this element bonded to a silicate. An atom of this element is found in cryolite, which is melted with this element's oxide in the Hall-Heroult process. Like boron, this element usually forms plus three ions, and its principal ore is bauxite. For 10 points, identify this light metal with atomic number thirteen and symbol Al.

ANSWER: **aluminum** [or **aluminium**; or **Al** until it is read]

234-13-93-04112

13. In one appearance, it is revealed that this character's briefcase is filled with donuts and ice cream. In another episode, this character feeds his friend advice on a walkie-talkie to help him pass his boat-driving test, though Mrs. Puff still fails him. This character's dwelling under a rock is separated from his friend's pineapple by their neighbor Squidward. For 10 points, identify this starfish, the best friend of Spongebob Squarepants.

ANSWER: **Patrick** Star

233-13-93-04113

14. The third of this man's rules states the sharing of edges and particularly faces by two anion polyhedra (pol-ee-HEE-druh) decreases the stability of an ionic structure. This man put forth his law for tetravalence bonding in 1932, along with a paper explaining the hybridization of electrons in bonding. This man used X-ray diffraction to determine the structure of a crystal. For 10 points, name this man with five laws that describe the structure of a crystal along with introducing the concept of electronegativity.

ANSWER: Linus **Pauling**

135-13-93-04114

15. These structures have 5.8S, 28S, and 18S subunits which combine to form 40S and 60S small and large subunits. Aminoacyl tRNA synthetase binds to these organelles' A sites; then, this organelle promotes the formation of a peptide bond. Mitochondria and chloroplasts have their own versions of these structures. The AUG start codon in mRNA is unveiled by these structures at the start of translation. They are found on the rough ER. For 10 points, name these organelles where proteins are synthesized.

ANSWER: **ribosomes**

190-13-93-04115



1A. Name the President during the Spanish American War who was assassinated by Leon Czolgosz (CHOLE-gosh).

ANSWER: William McKinley

1B. What Irish polymath invented quaternions and lends his name to a physical quantity equalling the sum of kinetic and potential energies?

ANSWER: William Rowan Hamilton

2A. What beast did Bellerophon kill for King Iobates, with the help of Pegasus and a leaden spear?

ANSWER: Chimera

2B. Which Thomas Hardy novel's title character has her marriage to Angle Clare disrupted because of her rape at the hands of Alec?

ANSWER: Tess of the d'Urbervilles [or Tess Durbeyfield; or Tess d'Urbervilles]

3A. What data structure with "binary" and "red-black" forms consists of nodes linked to child nodes?

ANSWER: trees

3B. Besides Sinhala, what is the official language of Sri Lanka, a tongue that also partly names a Sri Lankan separatist group?

ANSWER: Tamil

4A. What river serves as the border between Cambridge and Boston before emptying into the Atlantic Ocean?

ANSWER: Charles River

4B. What French artist painted a group of concubines in *The Women of Algiers* and a bare-chested personification of the title concept in his *Liberty Leading the People*?

ANSWER: Eugene Delacroix [or Ferdinand Victor Eugene Delacroix]

5A. This is 20-second calculation question. Find all values between 0 and 360 degrees, inclusive, for which cosine squared theta equals sine squared theta.

ANSWER: 45, 135, 225, 315 degrees [do not accept partial answers]

5B. This is a 20-second calculation question. What is the units digit of 7 to the 24000th power?

ANSWER: 1

6A. What ancient Greek pioneered medical technique and names a document that includes the line "I will prevent disease whenever I can."

ANSWER: Hippocrates of Kos

6B. In one of E. E. Cummings's most popular poems, what character "lived in a pretty how town"?

ANSWER: anyone

7A. A lulav and an etrog are shaken, and a booth is built, on what Jewish holiday sometimes called the Feast of Tabernacles?

ANSWER: Sukkot

7B. What 17-year-old's shooting death after buying some Skittles led to the Million Hoodie March and the trial of George Zimmerman?

ANSWER: Trayvon Martin

8A. Which French short story writer wrote about the prostitute Elizabeth Rousset in *Ball of Fat*?

ANSWER: Henri Rene Albert Guy de Maupassant

8B. In Archie comics, teenager Archie Andrews is torn between loving the blonde Betty and what rich, brunette girl?

ANSWER: Veronica [prompt on Lodge]

9A. What name is given to a line or set of lines that is repeated periodically throughout a poem?

ANSWER: refrain

9B. Despite being outnumbered, the English under Henry V won what 1415 battle in which the longbow and a muddy battlefield helped defeat the French?

ANSWER: Battle of Agincourt

10A. This is a 30-second calculation question. A basketball player makes a second free throw 80% of the time after making the first, but only 50% of the time if he misses the first. If he makes his first free throw 70% of the time, what is the expected number of free throws he makes in two shots?

ANSWER: 1.41

10B. This is a 30-second calculation question. The median of a set of three numbers is three larger than the mean. 6 is the unique mode of the set. What is the smallest number in the set?

ANSWER: -3



1. This poet wrote a collection describing many mundane objects such as artichokes and clothing. That work was titled *Elemental Odes*. One poem in one of this man's collections begins with the line "Tonight I can write the saddest lines," while he evokes the history of Latin America in *Canto General*. For 10 points, identify this Chilean poet of *Twenty Love Poems and a Song of Despair*.

ANSWER: Pablo Neruda [or Neftali Ricardo Reyes Basoalto]

140-13-93-04117

2. This element links three to five benzene rings in Salvarsan, a drug discovered by Paul Ehrlich that was the first effective treatment for syphilis. This element is used in a III-V semiconductor with gallium. Groundwater contamination of this element is a serious problem in Bangladesh. In 2010, NASA scientists incorrectly announced the discovery of a bacteria that incorporated this element into its DNA instead of the element above it on the periodic table, phosphorus. For 10 points, identify this poisonous element with symbol As.

ANSWER: arsenic [or As until it is read]

234-13-93-04118

3. As of September 2013, Matt McCaslin is the highest-ranked American player of this activity. Joseph and Robert Taylor's company built many of the modern innovations used in this activity. In its early stages, this game was played on New York City rooftops. Several decades later, the Lomma brothers introduced trick hazards to this activity, such as spinning windmill blades that the player has to time to get past. For 10 points, name this eighteen-hole activity played on carpet or astroturf.

ANSWER: mini-golf [or miniature golf; or crazy golf; or putt-putt]

020-13-93-04119

4. The narrator of one of this man's novels was born on the night that the Wilhelm Gusloff sank and discovers that his son is a hero to neo-nazis for shooting Wolfgang Stremplin. Another novel by this man follows Mahlke as he salvages items from a minesweeper. In addition to *Crabwalk* and *Cat and Mouse*, this man wrote about Oskar Matzerath, whose cry can be used as a weapon in another work. For 10 points name this author of *The Tin Drum*, which is part of his *Danzig Trilogy*.

ANSWER: Gunter Grass

123-13-93-04120

5. A politician from this country replied "I'm not a historian, I'm a politician" during an interview in New York. Its most recent election saw Saeed Jalili place third behind a former mayor of its capital city, Mohammed Ghalibaf. During a 2012 UN conference, a red line drawn on a picture of a bomb was used by Benjamin Netanyahu to show his position on this country's nuclear program. For 10 points, name this country led by Hassan Rouhani, the successor to Mahmoud Ahmadinejad.

ANSWER: Iran

232-13-93-04121

6. A method used for finding this location involves using multiple plumb lines and finding the point of intersection. The Fosbury Flop makes use of this location in high jumping by keeping it below the height of the bar. An object supported at this location will have no net torque acting on it. This point is located at the geometrical center of a homogeneous, symmetrical body. For 10 points, name this physical location that can be located on small objects by using a finger to find where they balance.

ANSWER: **center of mass** [or **center of gravity**]

023-13-93-04122

7. An officer of this state's military had his head thrown into the camp of his older brother after his defeat at Metaurus. This city was home to Hamilcar, a patriarch whose progeny included Mago and Hasdrubal Barca. Cato the Censor repeatedly advocated for the destruction of this city. This civilization's downfall was ensured when Scipio Africanus won the Battle of Zama against its general Hannibal. For 10 points, identify this Phoenician city that fought the Punic Wars against Rome.

ANSWER: **Carthage** [or **Carthago**; or **Kart-hadasht**]

195-13-93-04123

8. Upon the donation of this opera's libretto to the Parma Museum, it was discovered that there was a "missing act" the composer hadn't used. At the beginning of this opera, the main characters burn a manuscript to keep warm. The most famous aria from this opera, "Quando me'n vo'," is a waltz sung by Musetta to make Marcello jealous. At the end of this opera, tuberculosis claims the life of Mimi, who dies in Rodolfo's arms. For 10 points, name this Puccini opera set in the Latin Quarter of Paris.

ANSWER: *La **boheme*** [or *The **Bohemians***]

224-13-93-04124

9. A character in this novel is predicted to die when he sees two strange hearses. An old schoolmaster and "sub-sub-librarian" supposedly compiled the section "Etymology and Extracts," which give translations of and quotations about the title animal. A man nails a gold piece to a beam and promises it to the first man to see that animal will receive the coin. The narrator is the only survivor of the *Pequod*, and opens this novel with "Call me Ishmael." For 10 points, name this Herman Melville novel about Ahab's search for the white whale.

ANSWER: **Moby Dick**, or, the White Whale

121-13-93-04125

10. This painter's *Still Life with Ginger Pot I* came from his brief flirtation with Cubism. He painted bits of colored paper and plastic stuck to a lozenge-shape in an unfinished "victory" version of his most famous artwork. Across three blocks in another of his paintings, grey dots appear and disappear via an optical illusion. The city grid of Manhattan and a kind of dance music influenced his most famous painting. For 10 points, name this Dutch-born painter of *Broadway Boogie Woogie*.

ANSWER: Pieter (Piet) Cornelis **Mondrian** [or Mondriaan; not that the pronunciation is different or anything]

020-13-93-04126

11. A participant in this event, George Rappleyea, unsuccessfully invited H.G. Wells to participate in it. It involved an ACLU planned violation of the Butler Act. During it, a witness was asked where Cain got his wife and if Eve was created from Adam's rib. The prosecutor in this case, William Jennings Bryan, was humiliated by attorney Clarence Darrow. For 10 points, name this 1925 court case in which a Tennessee teacher was put on trial for teaching evolution.

ANSWER: **Scopes** trial [or Scopes **monkey** trial; or *The State of Tennessee v. John Thomas **Scopes***]

052-13-93-04127

12. According to the equation of exchange, the product of this quantity and the velocity is equal to average price times average quantity purchased. M2 is the most common measurement of this quantity used in comparative economics. Irving Fisher showed that the rate of change of this quantity is roughly equal to the rate of change of prices. That's why the Federal Reserve would cut this value to fight inflation. For 10 points, name this quantity, the amount of currency in circulation.

ANSWER: **money supply** [or **M** until it is read; or **M2** until it is read; or **money stock**; prompt on **money**]

190-13-93-04128

13. Meridional flow occurs in this structure and generates more vorticity than zonal flow. The lapse rate changes from positive to negative at the top of this region, also known as the temperature inversion. The lower boundary of the stratosphere is this layer's namesake "pause." 80% of the atmosphere's mass is in this turbulent layer, where most weather phenomena occur. For 10 points, identify this lowest layer of the atmosphere.

ANSWER: **troposphere**

228-13-93-04129

14. In July of this year, an outbreak of Legionnaires' disease hit Philadelphia, killing over twenty people. During this year, a governor gave an interview to *Playboy* magazine, where he admitted lusting in his heart for women. In Republican primaries in this year, the incumbent president defeated Ronald Reagan to earn the G.O.P. nomination. During the presidential election of this year, Jimmy Carter defeated Gerald Ford. For 10 points, name this year, the United States' bicentennial year.

ANSWER: **1976**

052-13-93-04130

15. Anti-rabbit is an example of the "secondary" type of these proteins, which can bond to the fragment crystallization region with high specificity. ELISA makes use of the strong affinity these proteins have for their substrates, or epitopes. Secreted by plasma cells, these proteins consist of two heavy chains and two light chains in a Y shape, which determines their isotype. For 10 points, name these proteins which bind to antigens in the immune system.

ANSWER: **antibodies** [or **immunoglobulins**]

190-13-93-04131



1. In one story, this god ate so much that when he was scared by a snake his stomach burst open. This god told his parents they were his world after being challenged by his brother to a race around the world. He gained his most notable feature after trying to prevent his father from seeing his mother in the bath. This son of Parvati and Shiva is known as the Remover of Obstacles and rides on a rat. For 10 points, name this god from Hinduism who had the head of an elephant.

ANSWER: Ganesha

235-13-93-04132

2. Both Robert R. and Gaetan Dugas are considered index cases for this disease. Randy Shilts wrote a history of it called *And the Band Played On*. Its cause was discovered independently by Robert Gallo and Luc Montagnier. Early victims included Rock Hudson, Freddie Mercury, and about ninety percent of hemophiliacs in the early 1980s due to blood transfusions. For 10 points, name this disease originally called Gay-Related Immune Deficiency which is now known to be caused by the HIV virus.

ANSWER: AIDS epidemic [or HIV epidemic before mention]

048-13-93-04133

3. This author wrote a book whose title character collects fingerprints and uncovers a mystery involving a servant named Chambers and Tom Driscoll being switched at birth. In another of this man's novels, a character uses the Great Seal of England to crack nuts. He wrote a novel in which peasant boy Tom Canty switches places with a son of King Henry VIII. For 10 points, name this author of *Pudd'nhead Wilson* and *The Prince and the Pauper*.

ANSWER: Mark Twain [or Samuel Langhorne Clemens]

052-13-93-04134

4. This man wrote a story in which the protagonist tells a story to Sybil Carpenter while wading in the ocean. That story features title creatures which gorge themselves on fruit and get too fat to escape feeding holes. This author wrote about Seymour Glass' suicide in "A Perfect Day for Bananafish." He created a youthful character expelled from Pencey Prep who disdains "phonies." For 10 points, name this reclusive author of the *Nine Stories*, who created Holden Caulfield in *Catcher in the Rye*.

ANSWER: Jerome David "J.D." Salinger

052-13-93-04135

5. The structure of molecule is probed using a nuclear magnetic form of this concept. Galileo was one of the first scientists to describe this phenomenon, in experiments with pendulums. The acoustical version of it is responsible for the harmonics of musical instruments and the ability to shatter glass with sound. For 10 points, name the tendency of systems to oscillate at greater amplitude at particular frequencies, responsible for the Tacoma Narrows Bridge disaster.

ANSWER: resonance

147-13-93-04136

The Ostwald process turns ammonia into what acid, mixed with hydrochloric acid in aqua regia?

ANSWER: nitric acid

This is a calculation question. What is the reference angle, in degrees, of an angle measuring 7π over 6 radians?

ANSWER: π over 6 radians [or 30 degrees]