



1. This desert contains a series of temples at the Mogao Caves complex. The only bears which live in a desert are native to this location. It is home to the mythical “death worm” which can supposedly shoot acid. It is home to the Bactrian camel and was where the first dinosaur eggs were found. This desert is bordered on the west by the Taklamakan Desert. The Himalayas block rain clouds from reaching it. For 10 points, name this desert in northern China.

ANSWER: Gobi Desert

052-13-90-02101

2. Epiphytes exhibit an example of this type of relationship called phoresy. This type of relationship can be classified as obligate, or necessary to survival, and facultative. Shelter, transport, and food are common motivations for the development of them, which are exemplified by clownfish and anemones. This type of relationship can be divided into commensalism, mutualism, and parasitism. For 10 points, name this type of biological relationship in which two organisms live closely together.

ANSWER: symbiosis [prompt on commensalism; prompt on mutualism; prompt on parasitism]

124-13-90-02102

3. This character plays around with a “pinchbug” which eventually latches onto a stray poodle. This character gives a brass doorknob to a girl as an “engagement gift,” after which he is called a “Benedict Arnold” for lying. He reveals the truth about Dr. Robinson’s murder and exonerates Muff Potter. This character is trapped in a cave with Becky Thatcher, where he sees Injun Joe. For 10 points, name this Mark Twain character who tricks his friends into whitewashing a fence.

ANSWER: Tom Sawyer [or Tom Sawyer]

227-13-90-02103

4. An unusually large type of this structure is found within the cells of the salivary glands of *Drosophila* and is called polytene. Scaffolding proteins and histones help comprise these structures. They can be viewed on a karyogram, which can detect aneuploidies. These structures are formed from condensed genetic material before a cell divides. For 10 points, name this DNA-containing structure, of which 23 pairs are found in humans.

ANSWER: chromosomes [prompt on chromatin]

140-13-90-02104

5. A class of drugs that blocks the receptor named for this letter is used to treat high blood pressure. This letter represents the probability of a type II error in statistics. The inclusion of the neutrino for this type of decay allowed it to satisfy the law of conservation of energy. That of decay named for this letter is mediated by the weak force and involves an electron or positron being emitted from an atomic nucleus. For 10 points, identify this Greek letter that denotes a type of radioactive decay grouped with alpha and gamma decay.

ANSWER: beta

066-13-90-02105

6. Fred Vinson died during deliberations of this Supreme Court decision. It was based on such factors as the Clark study, which examined dolls selected by children. This Warren Court case was argued by Paul Wilson and Thurgood Marshall. The plaintiff was motivated by his daughter having to travel a mile to reach her school. This decision overturned *Plessy v. Ferguson*. For 10 points, name this 1954 Supreme Court decision which declared that segregated schools were “inherently unequal.”

ANSWER: **Brown** v. *Board of Education of Topeka, et al.*

052-13-90-02106

7. Étienne Falconet created a bronze sculpture of this man atop a horse. While a child, this man organized his friends into a "Toy Army." To regain his country's access to the Baltic Sea, this ruler attacked the forces of Charles XII, sparking the Great Northern War with Sweden. This man learned about European ship-building techniques while in Holland on his Grand Embassy. For 10 points, name this tsar who mandated that the boyars shave their beards as part of his modernization of Russia.

ANSWER: **Peter** the Great [or **Peter I**]

233-13-90-02107

8. This force is described as a consequence of spacetime curvature in general relativity. Henry Cavendish used a torsion balance to measure a constant associated with this force. That constant associated with this force equals about 6.67 times ten to the negative eleventh power in standard SI units. This is the only force acting on an object in free fall. Newton developed a “universal law” of this force. For 10 points, name this force that attracts all objects with mass to each other.

ANSWER: **gravity** [accept **gravitation**; accept **weight**]

185-13-90-02108

9. This character is first described by Richard Enfield, who mentions him ostentatiously signing a check. This man's suicide note is read by the lawyer Utterson, and Dr. Lanyon tries while trying to save him. He tramples a young girl without mercy and uses his cane to murder Sir Danvers Carew. This man eventually no longer requires a potion in order to transform into his fiendish counterpart. For 10 points, name this scientist invented by Robert Louis Stevenson who transforms into the evil Mr. Hyde.

ANSWER: Henry **Jekyll** [or **Henry** Jekyll; accept **Hyde** until mentioned; accept **Edward** until “Hyde”]

052-13-90-02109

10. This man oversaw the killing of the circus elephant Topsy. While working with X-Rays, he ended up causing his assistant, Clarence Dally, to become ill and die. His last breath was sealed into a test tube and now resides in a museum named for his good friend, Henry Ford. This man fought George Westinghouse in the “War of the Currents.” His namesake film company utilized the “Kinetograph” and he demonstrated one of his other inventions by recording a reading of “Mary Had a Little Lamb.” For 10 points, name this “Wizard of Menlo Park,” the inventor of the motion picture camera and the phonograph.

ANSWER: Thomas Alva **Edison**

052-13-90-02110

11. A longstanding problem concerns whether or not these objects destroy information. A region called the ergosphere surrounds these objects if they are rotating. These objects can evaporate by emitting Hawking radiation. These objects are surrounded by a boundary called the event horizon. The centers of many galaxies are probably home to “supermassive” versions of these objects. For 10 points, name these astronomical objects so massive that nothing can escape their gravity.

ANSWER: **black holes**

185-13-90-02111

12. This was the goal of a group of protesters called the Silent Sentinels who labeled the President “Kaiser” when picketing the White House. That group angered Woodrow Wilson and was led by Alice Paul. This was the goal of the group NWSA, which was founded by Elizabeth Cady Stanton and Susan B. Anthony. For 10 points, name this action legalized throughout the United States by the 19th Amendment, which granted the right to vote for a certain class of citizens.

ANSWER: **women’s suffrage** [or answers mentioning **women being able to vote**; accept **19th Amendment** being passed until mentioned]

052-13-90-02112

13. It takes at most seven colors to fill in a map drawn on this surface. This shape, which consists of all points a given distance from a given circle, can be mapped to a rectangle whose left and right edges and top and bottom edges are adjacent. It can be obtained by rotating a circle around a non-intersecting axis. This shape has genus 1 because of the hole in the middle, which is why people joke topologists can't tell it apart from a coffee cup. For 10 points, identify this geometrical figure shaped like a donut.

ANSWER: **torus**

233-13-90-02113

14. The largest national forest in the contiguous United States is this state's Humboldt National Forest. The Truckee River on this state's western border flows out of its Lake Tahoe. Three-quarters of this state's population lives in its southernmost Clark County, home to the city of Paradise. One city in this state contains a long, well-lit "Strip" home to the Luxor, Caesars Palace, and the Bellagio. For 10 points, identify this western state home to Carson City and Las Vegas.

ANSWER: **Nevada**

233-13-90-02114

15. This practice was the subject of an “essay on comparative moral statistics” by Henry Morselli. The rates of it were determined to higher in times of peace than war and also higher among Protestants than Catholics. In a sociological text, this practice was distinguished between the egoistic, altruistic, anomic, and fatalistic. For 10 points, name this practice, the title of an 1897 Emile Durkheim study.

ANSWER: **suicide**

052-13-90-02115



1A. What act of arson did the Nazis blame on Marinus van der Lubbe, possibly in a scheme to seize power?

ANSWER: burning of the Reichstag [or Reichstag Fire]

1B. What type of poem is composed of six stanzas each made up of six lines, followed by an *envoi*?

ANSWER: sestina

2A. Name the European country whose precipitous debt issues since 2011 have given rise to the Indignant Citizens Union and the Golden Dawn movement.

ANSWER: Greece

2B. What American sculptor is famous for creating mobiles such as *Lobster Trap and Fish Tail*?

ANSWER: Alexander Calder

3A. This is a 20-second calculation question. If the sine of a first-quadrant angle is the square root of one fifth, what, in simplest terms, is the cosine of that angle?

ANSWER: 2 over square root of 5 [or 2 times the square root of 5, over 5]

3B. This is a 20-second calculation question. If I flip five fair coins at the same time, what is the probability that more land heads than tails?

ANSWER: 1/2 [or 0.5]

4A. What Russian composer wrote *The Isle of the Dead* and *Rhapsody on a Theme of Paganini*?

ANSWER: Sergei Rachmaninoff

4B. What composition by Maurice Ravel consists of a gradual crescendo as the orchestra plays the same melody eighteen times in a row?

ANSWER: Bolero

5A. What American poet of “i sing of olaf glad and big” used unusual punctuation and lowercase letters?

ANSWER: E. E. Cummings

5B. What name is given to the people who attempted to cheat during the Land Run of 1889 by crossing the border of the Oklahoma Territory before it was opened?

ANSWER: Sooners

6A. What Syfy TV-movie aroused quite a storm with its depiction of man-eating aquatic animals descending upon Los Angeles?

ANSWER: Sharknado

6B. What English poet asked “If Winter comes, can Spring be far behind?” in his poem “Ode to the West Wind”?

ANSWER: Percy Shelley

7A. What grammatical mood, exemplified by the phrase “i would have,” alters verbs in clauses expressing volition, negation, or doubt, in contrast to the indicative?

ANSWER: subjunctive mood

7B. What American soccer player scored three headers against Brazil, France, and Japan respectively during the 2011 FIFA Women’s World Cup?

ANSWER: Abby Wambach [or Mary Abigail Wambach]

8A. What Dutch computer scientist names a shortest path algorithm that he devised in 1956?

ANSWER: Edsger **Dijkstra**

8B. What rule that developed in France and was used by several European dynasties held that persons who descended from the previous king solely through a woman were ineligible to take the throne?

ANSWER: **Salic** Law of Succession

9A. This is a 30-second calculation question. In simplest form, what is the result of dividing the complex number " $-5 + 9i$ " by " $1 - i$ "?

ANSWER: **-7 + 2i**

9B. This is a 30-second calculation question. Line AB intersects perpendicular lines CD and EF at points G and H, respectively. If angle AGC measures 130 degrees, what is the measure of angle BHF?

ANSWER: **40** degrees [or **140** degrees; accept either answer as both ways of drawing EF are acceptable]

10A. What avatar of Vishnu killed Ravana in order to save his wife Sita?

ANSWER: Lord **Rama**

10B. Which artist included *Fight with Cudgels* and *Saturn Devouring His Son* in his *Black Paintings*?

ANSWER: Francisco Jose de **Goya** y Lucientes



1. Napoleon Bonaparte allegedly discovered a theorem that involves externally constructing these figures. Only in these shapes can the length of the circumradius be exactly twice the length of the inradius. When these shapes have side-length one, their area equals the one-fourth times the square root of three. One can prove that a figure is of this type if any two of its circumcenter, incenter, orthocenter, or centroid are the same. For 10 points, identify these triangles which have 60 degree angles and equal side-lengths.

ANSWER: equilateral triangles [prompt on triangles]

233-13-90-02117

2. The Fischer-Tropsch process produces hydrocarbons and this compound. Cobalt chloride turns from blue to red in its presence, forming a coordination complex with six copies of this molecule. The very high surface tension of this molecule is responsible for its upward facing meniscus and enables capillary action to occur. This compound in its purest form has a pH of 7, and is known as the "universal solvent." For 10 points, identify this molecule consisting of two hydrogens and one oxygen.

ANSWER: water

233-13-90-02118

3. This character is forced to produce vitamin-enriched malt syrup for pregnant women at a factory, and he marries Valencia Merble after completing optometry school. Eliot Rosewater recommends this character various novels by Kilgore Trout, and at one point, this character is exhibited in a zoo at the planet Tralfamadore. For 10 points, name this protagonist of Kurt Vonnegut's *Slaughterhouse-Five*.

ANSWER: Billy Pilgrim [or Billy Pilgrim]

227-13-90-02119

4. In patients with this disease, levels of hemoglobin A1C are often monitored. A sizable proportion of patients with this disease develop ulcers in their feet, and other complications include retinopathy and nephropathy. An autoimmune attack causes unpredictable bouts of hypo- and hyper-glycemia in one form of this disease, which results in the destruction of the beta cells in the islets of Langerhans, stopping the production of insulin. For 10 points, name this disease whose type I and type II forms both involve an elevated level of blood sugar.

ANSWER: diabetes mellitus

020-13-90-02120

5. The Venturi effect involves a reduction of this quantity in a fluid. Bernoulli's principle states that if fluid speed increases either potential energy or this quantity must decrease. A change in this quantity is transmitted undiminished throughout a fluid by Pascal's principle. The ideal gas law sets the product of it and "V" equal to "n" "R" "T." For 10 points, name this quantity that equals force per unit area and that can have units of pascals.

ANSWER: fluid pressure [accept hydraulic head until Bernoulli's principle; prompt on "P"]

185-13-90-02121

6. This man wrote such plays as *The Mandrake*, though he is more noted for nonfiction such as a book that argued Romulus should not be blamed for killing Remus because the ends justified the means. This author of the *Discourses on Livy* expressed the hope that Italy would be freed from "barbarians," and warned against unrealistic generosity and virtue, in a handbook for rulers. For 10 points, name this author who wrote that "it is safer to be feared than loved" in *The Prince*.

ANSWER: Niccolo **Machiavelli**

142-13-90-02122

7. Charlie Bolden leads this organization, which was the primary target of the Augustine Committee. Florida Senator Bill Nelson was once a member of this organization and has criticized President Obama's shift away from the VSE that President Bush proposed for this agency. Projects launched by this organization include MESSENGER, Constellation, and Curiosity. For 10 points, name this federal agency responsible for the space program.

ANSWER: **NASA** [or the **National Aeronautics and Space Administration**]

190-13-90-02123

8. One novel by this author climaxes when a falling bookcase kills Leonard Bast, who had previously had an affair with Helen Schlegel. In another of this author's novels, Lucy Honeychurch returns to Florence with George Emerson after deciding not to marry the richer Cecil Vyse. This author of *Howard's End* created Adela Quested, an Englishwoman who accuses the Indian Dr. Aziz of raping her in the Marabar Caves. For 10 points, name this English author of *A Room with a View* and *A Passage to India*.

ANSWER: Edward Morgan **Forster**

080-13-90-02124

9. One of this religion's texts is composed of three *dong*, and contains the Lingbao scriptures. Compassion, moderation, and humility make up this religion's Three Jewels. The practice of "action without action" in this religion is said to lead to a state of "pure experience" known as Pu. This religion's concept of *wu-wei* is outlined in its principal text, written by Laozi. For 10 points, name this passive religion which is balanced with Buddhism and Confucianism in China.

ANSWER: **Daoism** [or **Taoism**]

136-13-90-02125

10. In one song, this rapper raps about how "Back in the day money was short" but that he's "making it taller." In another song, he raps about hitting "the pedal once" and making "the floor shake." This creator of the album *O.N.I.F.C.* collaborated with 50 Cent on "Telescope." For 10 points, name this rap artist who, in his album *Rolling Papers*, performs "When I'm Gone" and "Black and Yellow."

ANSWER: **Wiz Khalifa** [or Cameron Jibril **Thomaz**]

130-13-90-02126

11. One type of these animals is named for an island covered in ash by the eruption of nearby Novarupta. Another of these animals names a body of water on which the Eldorado Mine and the Deline settlement lie; that body of water is the largest lake lying entirely in Canada. The word "Arctic" derives from the Greek word for this animal. For 10 points, name this type of animal that appears on the flag of California, and whose "Kodiak" variety lives on a namesake island in Alaska.

ANSWER: **bears** [or Kodiak **bears**]

080-13-90-02127

12. This novel asserts that “a king is history’s slave” in a chapter outlining the author’s theory of history. This novel’s protagonist leaves his wife Helene and wins a duel against Dolokhov. In this book, Prince Andrei survives the Battle of Austerlitz. At this novel’s conclusion, Pierre decides against assassinating Napoleon and winds up marrying Natasha Rostov. For 10 points, name this giant novel written by Leo Tolstoy.

ANSWER: War and Peace [or Voyna i Mir]

190-13-90-02128

13. This object is judged to be “more loathsome” even though its owner tries “the denial of self.” This object is created by Basil Hallward, who is murdered by his patron. It is last seen displaying “exquisite youth and beauty” as a “withered” and “wrinkled” man lies nearby with a knife in his heart. That occurs after this object is stabbed after developing an aged appearance as its subject sins and remains youthful. For 10 points, name this piece of artwork that is the title object in an Oscar Wilde novel.

ANSWER: picture of Dorian Gray [accept synonyms for “picture” like “portrait”]

052-13-90-02129

14. One novel by this author compares the lives of Chambers and Tom Driscoll after the two are switched at birth. In one novel by this author, Edward uses the Great Seal of England to prove his identity after he swaps lives with Tom Cauty. In another of his novels, Miss Watson’s slave Jim escapes and travels with the title character down the Mississippi. For 10 points, name this author of *Pudd’nhead Wilson*, *The Prince and the Pauper*, and *The Adventures of Huckleberry Finn*.

ANSWER: Mark Twain [or Samuel Langhorne Clemens]

140-13-90-02130

15. A 2013 adaptation of this opera by the Metropolitan Opera sets this work in 1960s Las Vegas. One character in this work claims to be a student named Gualtier Malde in order to woo a woman who is being hidden from the public by her father. In this opera, the title character's daughter Gilda is stabbed by Sparafucile. It is based on the Victor Hugo play *Le Roi S'Amuse* and includes the Duke of Mantua’s aria “La donna e mobile.” For 10 points, name this opera by Giuseppe Verdi about a hunchbacked jester.

ANSWER: Rigoletto

030-13-90-02131





1. Pigments and crystals are among the "inclusions" observable by an electron micrograph in this substance. This substance is "pinched" in a "kinesis" that occurs after anaphase is finished. Amoebas project this substance as pseudopods to move around. Free ribosomes occur in this substance, the site of glycolysis, which consists of 70 to 90% water. In plants, this substance is bounded by both the cell membrane and the cell wall. For 10 points, name this gel-like substance that surrounds the organelles of a cell.

ANSWER: cytoplasm [or cytosol]

020-13-90-02132

2. Near the end of this play, one character attacks another with a paper knife after the latter's rant about a "coward holding a baby-killer in his manly arms," prompting a third character to note, "there's no need for red-hot poker." The protagonists of this play are army deserter Joseph Garcin (gar-SAN), the lesbian Ines, and Estelle, who discovers that stabbing Ines has no effect. For 10 points, name this Jean-Paul Sartre (SAR-truh) play in which the characters realize they are dead and that "Hell is other people."

ANSWER: No Exit [or Huis Clos]

052-13-90-02133

3. These constructs have  $n - 2$  radial nodes and one angular node. These constructs have an angular momentum quantum number of one and a minimal principal quantum number of two. Two of these overlap in order to form a pi bond. For a given energy level, there exist three of these, which are mutually perpendicular and have a dumbbell shape. For 10 points, name these atomic orbitals that can hold 6 electrons and are typically filled after s orbitals.

ANSWER: p orbital

048-13-90-02134

4. After this event happened, Governor Thomas Hutchinson sent soldiers to Castle Island. A Paul Revere illustration shows it as a planned attack. This event killed the runaway slave Crispus Attucks and its perpetrators were defended by John Adams. Contrary to popular belief, many of the victims were armed and threw snowballs at the perpetrators. For 10 points, name this March 5, 1770 incident in which British soldiers shot civilians in a New England city.

ANSWER: Boston Massacre [or Incident on King Street]

052-13-90-02135

5. Gas bubbles in this material are called amygdules. Lakes of it can be found at Erta Ale in Ethiopia. This material can emerge from an underwater vent in the "pillow" variety, and it is typically preceded by dangerous flows called lahars. Several types of it are given Hawaiian names like 'A'a (AH-AH) and pahoehoe (PAH-hoy-hoy). If this material is underneath the earth's surface, it is called magma. For 10 points, name this molten rock which is expelled by a volcano.

ANSWER: lava [do not accept "magma"]

052-13-90-02136

What fourteenth century Emperor of Mali made a pilgrimage to Mecca featuring 80 camels with 300 pounds of gold and 12,000 slaves?

ANSWER: Mansa Musa [or Kankan Musa]

This is a calculation question. Given the set of numbers 4, 5, 7, 7, 8, 10, 13, 14, 20; find the sum of the median and mode.

ANSWER: **15**