



1. This artist painted a skeleton smoking a cigarette. His portrait of a melancholy white-capped man leaning his head on his right arm fetched the highest ever price for a piece of art at a public auction. This man painted two portraits of his physician Dr. Gachet and produced a dimly-lit canvas in which five peasants prepare to eat the title meal. His most famous painting depicts the sky over the village of Saint-Remy. For 10 points, name this Dutch artist of *The Potato Eaters* and *Starry Night*.

ANSWER: Vincent van Gogh

141-13-95-01101

2. One of this author's poems refers to the title character as "the wisest and fairest of Angels" and repeatedly asks him to "take pity on my long misery." In another poem, he compares himself to a creature with "unmanageable wings." This author of "The Litanies of Satan" and "The Albatross" included those poems in a collection divided into sections such as "Revolt," "Spleen and Ideal," and "Parisian Scenes." For 10 points, name this French poet who wrote *Les Fleurs du Mal*.

ANSWER: Charles Baudelaire (boh-duh-LAIR)

127-13-95-01102

3. This play begins with the title character's spouse trying to wed Glauce (GLOW-kuh), the daughter of Creon of Corinth. King Aegeus of Athens offers the title character sanctuary if she cures his impotence, which sets her schemes in motion. The title character murders Glauce and Creon with a poisoned dress and murders her children to spite her husband before she rides off in a dragon-pulled chariot. For 10 points, name this play by Euripedes (yur-IP-uh-dees) about the wife of Jason.

ANSWER: Medea

147-13-95-01103

4. This quantity and its partial molar equivalent, chemical potential, are constant between two equimolar phases in equilibrium. In a voltaic cell, the change in this quantity equals the cell potential times Faraday's constant times the number of electrons transferred. Its change will be negative if the equilibrium constant is greater than one, which happens if a reaction occurs spontaneously. It is the enthalpy minus temperature times entropy. For 10 points, name this free energy named for an American chemist.

ANSWER: Gibbs free energy [or G]

190-13-95-01104

5. This novel includes a scene where three characters link hands on a scaffold beneath the light of a meteor. The conception of one of those characters is symbolized by a rosebush at this novel's beginning. This novel also features the protagonist's embittered husband, a doctor named Chillingworth who seeks revenge on her lover, the Reverend Dimmesdale. For 10 points, name this Nathaniel Hawthorne novel in which the adulterous Hester Prynne must wear the title object on her clothes.

ANSWER: *The* Scarlet Letter

059-13-95-01105

6. C.F. Du Fay distinguished between "vitreous" and "resinous" types of this phenomenon. Experiments on this phenomenon could be conducted using tin foil-lined containers called Leyden jars. Benjamin Franklin described it as a single fluid which he tried to capture by flying a kite in a lightning storm. For 10 points, name this physical phenomenon whose direct current form Thomas Edison favored over alternating current.

ANSWER: electricity

237-13-95-01106

7. This author published a collection of short stories entitled *The Eternal Moment*, which includes a story where Kuno and Vashti observe the title occurrence. In addition to writing "The Machine Stops," he wrote about Philip Herriton's efforts to retrieve Lilia from Italy in *Where Angels Fear to Tread*. In his most famous novel, Adela Quested accuses Dr. Aziz of rape during a trip to the Marabar Caves. For 10 points, name this author of *Howards End* and *A Passage to India*.

ANSWER: E. M. **Forster**

146-13-95-01107

8. 2,3-BPG stabilizes the T state of this protein. A lower pH, or higher carbon dioxide concentration, shifts this protein's sigmoidal substrate-binding curve to the right. It also exhibits cooperative binding. One histidine and four pyrrole (PEER-ohl) nitrogens coordinate the iron at this protein's center, though the sixth ligand can be either carbon monoxide or oxygen gas. For 10 points, name this protein that carries oxygen in red blood cells.

ANSWER: **hemoglobin** [or **Hb**]

190-13-95-01108

9. This man tried to duel with Colonel Easton, who downplayed this agent of the Massachusetts Committee of Safety's role in capturing Fort Ticonderoga alongside Ethan Allen's Green Mountain Boys. This man married the Loyalist Peggy Shippen while serving as military commander of Philadelphia. His actions were exposed when his confederate, John Andre, was captured. For 10 points, name this commander of West Point and hero of Saratoga who defected to the British in 1780.

ANSWER: Benedict **Arnold**

019-13-95-01109

10. Prominent performers of this instrument include Alex Klein and Heinz Hollinger. Mozart's D major flute concerto was reworked from a C major concerto for this instrument, which introduces the Swan theme from *Swan Lake*. The cor anglais is a member of this instrument's family. The concert A played by this instrument is used to tune the rest of the orchestra. The Duck in *Peter and the Wolf* is represented by this instrument. For 10 points, name this double reed woodwind instrument.

ANSWER: **oboe**

020-13-95-01110

11. In these features, cold seeps leak methane and hydrogen sulfide. Upwelling in these features brings nutrient rich water to the surface. These features are quickly being turned acidic by the absorption of carbon dioxide emissions. Large, flat areas lying beneath these features are called abyssal plains, which are found after the continental rise. For 10 points, identify this geographical feature that covers over 70% of the Earth's surface with liquid water.

ANSWER: **oceans** [or **sea**; or **ocean floor** until "carbon" is read; prompt on **water**, **lakes**, and other bodies of water]

239-13-95-01111

12. This colony sent no delegates to the First Continental Congress. Casimir Pulaski died trying to lift a siege in this colony during the Revolutionary War. During the war, the British seized rice from this colony, which was its staple cash crop after slavery was legalized. It was originally established as a colony for debtors by James Oglethorpe. For 10 points, name this colony whose largest city was Savannah.

ANSWER: **Georgia**

121-13-95-01112

13. A form of this quantity is proportional to one-half the rank-four stiffness tensor, and the gradient of this quantity is equal to force. For a magnetic particle, it equals the dot product of magnetization and the B field. For simple elastic systems, it is proportional to displacement squared. For 10 points, identify this physical quantity which is the energy stored in an object upon displacement through some force.

ANSWER: **potential** energy [or change in **potential** energy]

234-13-95-01113

14. This being's killer dedicated the temple of Artemis Soteira, and this creature punished young people for the death of Androgeus (an-droh-JAY-uss). The son of Pasiphae, this thing slew Athenian youths on a regular basis, until it was killed by the lover of Ariadne. Using a ball of thread to find his way, Theseus slew this beast, which was located in the center of the Labyrinth at Crete. For 10 points, name this creature with the head of a bull on a man's body.

ANSWER: **Minotaur**

052-13-95-01114

15. This present-day country is where the Babi Yar massacre occurred at a ravine near the capital. Millions of residents of this present-day country died in the Holodomor, a genocidal mass famine resulting from collectivized farming. In 2004, Victor Yanukovich won a rigged election in this country, but was deposed by popular outcry in the Orange Revolution. For 10 points, name this former Soviet republic where the *Battleship Potemkin* docked in Odessa.

ANSWER: **Ukraine**

080-13-95-01115



1A. What type of objects or variables cannot be modified after they are declared, and are declared with the "final" keyword in Java and the "const" keyword in C and C++?

ANSWER: immutable object

1B. What name is given to the moment of greatest intensity in a narrative, conventionally thought of as being followed by the "falling action"?

ANSWER: climax

2A. After Steven Rogers volunteered for Project: Rebirth, he became what early superhero of the Marvel Universe?

ANSWER: Captain America

2B. What eighteenth-century English author wrote the epistolary novels *Pamela* and *Clarissa*?

ANSWER: Samuel Richardson

3A. This is a 20-second calculation question. Some two-legged men and some four-legged cows are walking in a pasture. A passerby counts 30 legs and 9 heads. How many men are there?

ANSWER: 3

3B. This is a 20-second calculation question. If a dartboard is made of concentric circles of radii 1, 3, and 5, what is the probability a dart hitting the board lands in the middle ring?

ANSWER: 8/25 or 0.32 or 32%

4A. The brightness of a star as viewed by a person standing on earth is represented by what quantity?

ANSWER: apparent magnitude [prompt on magnitude; do not accept "absolute magnitude"]

4B. What Latin noun case is formed with a long "a" for first-declension nouns and a long "u" for fourth-declension nouns?

ANSWER: ablative

5A. What US state includes Biscayne National Park and the cities of Buena Vista and Sarasota?

ANSWER: Florida

5B. What NBA team led by Dwight Howard and James Harden plays its games at the Toyota Center?

ANSWER: Houston Rockets [or Houston Rockets]

6A. In what year did William the Conqueror defeat Harold Godwinson at the Battle of Hastings to begin the Norman conquest of England?

ANSWER: 1066

6B. Kata Tjuta (TYOO-tuh) and what other large sandstone formation sacred to the Anangu (ah-NAHN-goo) are found in the Northern Territory of Australia?

ANSWER: Uluru [or Ayers Rock]

7A. What English actor voiced both Smaug and the Necromancer in *The Hobbit*?

ANSWER: Benedict Cumberbatch

7B. The Hindu god Brahma was born from what flower, with which he is often depicted?

ANSWER: lotus flower

8A. What biopolymer is commonly found in the cell walls of fungi and the exoskeletons of ants?

ANSWER: chitin

8B. What British political party led by Ed Miliband is currently the official opposition to a coalition government between the Conservative Party and the Liberal Democrats?

ANSWER: **Labour** Party

9A. This is a 30-second calculation question. If a triangle has sides of length 6, 8, and 10, what is the radius of a circle inscribed inside it?

ANSWER: **2**

9B. This is a 30-second calculation question. How many roots does the equation $3 \sin 2x = \cos x$ have in the interval 0 to 2π ?

ANSWER: **4** roots

10A. What Russian composer counted among “The Five” composed *Night on Bald Mountain* and *Pictures at an Exhibition*?

ANSWER: Modest **Mussorgsky**

10B. What man was exiled to the island of Saint Helena after fighting in the Hundred Days?

ANSWER: Napoleon **Bonaparte** [prompt on **Napoleon**]



1. This poet describes two people "taking turns at the Chimborazo" in a poem beginning "Love, thou art high, I cannot climb thee." Another of her poems claims that "to comprehend a nectar requires sorest need." This poet wrote the line "the dews grew quivering and chill" in a poem describing a character who "kindly stopped for me." For 10 points, name this "Belle of Amherst," a reclusive poet who wrote "Success is counted sweetest" and "Because I could not stop for death."

ANSWER: Emily Dickinson

192-13-95-01117

2. The n -th power of this number is equal to this number raised to the power of $n \bmod 4$. This number multiplies the sine term in both de Moivre's formula and Euler's formula. e raised to this number times π is equal to negative one according to Euler's identity. The term containing this number has its sign changed when taking the complex conjugate. For 10 points, identify this number defined as the square root of negative one and which is the unit of imaginary numbers.

ANSWER: i [or j; or the imaginary unit until "imaginary" is read]

066-13-95-01118

3. A story by this author features Seymour committing suicide after telling a story about a "very ordinary looking" fish. That story marks the first appearance of the Glass family in this author's writings. In a novel by this author, the protagonist asks where the ducks have gone after he returns to New York from Pencey Prep before visiting his sister Phoebe. For 10 points, name this author who wrote about Holden Caulfield in *The Catcher in the Rye*.

ANSWER: J. D. Salinger

002-13-95-01119

4. Chromates oxidize this compound to acetic acid, and change color from orange to green when it is present. Methanol poisoning is usually treated with this compound. This compound forms an azeotrope with pure water at 96 volume percent. Because its boiling point is 78 degrees Celsius, thermometers that use this liquid instead of mercury only function up to that temperature. Yeasts convert glucose to carbon dioxide and this organic molecule in fermentation. For 10 points, name this alcohol found in beer.

ANSWER: ethanol [or C₂H₅OH; or C₂H₆O; prompt on alcohol before it is read]

190-13-95-01120

5. This man ordered the imprisonment of a man who criticized his plan for industrializing "poor and blank" lands after the Lushan conference. The Gang of Four jockeyed for power after his death. He asked citizens to produce steel and not farm, resulting in a great famine. He advocated the Great Leap Forward and declared war on intellectuals in the Cultural Revolution. For 10 points, name this author of the *Little Red Book* who was the first chairman of Communist China.

ANSWER: Mao Zedong

020-13-95-01121

6. The Navier-Stokes equations are a special case of Cauchy's equation named for this quantity. The quotient of Planck's constant and the de Broglie (duh BROI) wavelength is this quantity. The change in this quantity equals the integral of force with respect to time. Recoil is a consequence of the conservation of this quantity, which occurs in the absence of external forces, in both elastic and inelastic collisions. For 10 points, name this quantity symbolized p and equal to mass times velocity.

ANSWER: linear **momentum** [or **p** until it is read; do not accept or prompt on "angular momentum"]

190-13-95-01122

7. A narrator in one of this composer's operas tells of "two lovers" who "sat on a park bench with their bodies touching, holding hands in the moonlight." He worked with Constance DeJong on an opera whose three acts reference Leo Tolstoy, Rabindranath (rah-BIN-druh-nont) Tagore, and Martin Luther King, Jr. This man is best-known for an opera with interludes called "knee plays" that is named for a physicist. For 10 points, identify this American minimalist composer of *Einstein on the Beach*.

ANSWER: Philip **Glass**

189-13-95-01123

8. This country was traditionally organized into very small villages known as "phum" (POOM), which each affiliated with a larger "khum" (KOOM) under the supervision of a Buddhist temple. As a result, secondary cities here such as Batdambang (BOT-dom-bong) and Kampong Cham have not reached the population level of its only large urban center, found where the Sab and Bassac Rivers meet the Mekong. For 10 points, name this country, the location of Angkor Wat and Phnom Penh.

ANSWER: Kingdom of **Cambodia** [or Preahreacheanachakr **Kampuchea**]

019-13-95-01124

9. In Brazil, this non-Portuguese language is spoken mostly in Rio Grande do Sul. Dialects of this language include Hutterite, and a community of speakers of this language is found in Gillespie County, Texas. Closer to its home, this language has Riparian (RIP-yoo-AIR-ee-en), Franconian, and Alsatian forms. The only African country in which it is prominent is Namibia. For 10 points, name this language, prominently spoken by the Amish and in the largest country in Western Europe.

ANSWER: **German** [or **Deutsch**; or **Dietsch**]

111-13-95-01125

10. In *Kafka on the Shore*, Johnnie Walker kidnaps one of these animals named Goma. Bengalsky is decapitated by one of these animals named Behemoth in *The Master and Margarita*. Thomas Gray composed an ode on the death of a favorite one of these animals. T. S. Eliot included "Bustopher Jones" and "Macavity" in "Old Possum's Book of Practical" ones. For 10 points, name this animal that, in a Tennessee Williams play, is "on a hot tin roof."

ANSWER: **cats** [or obvious equivalents]

198-13-95-01126

11. The Supreme Court has agreed to examine the constitutionality of this action in the upcoming *NLRB v. Noel Canning*. Harry Reid started the habit of pro forma sessions to prevent these events from happening, though President Obama declared those sessions invalid when he did this with Richard Cordray, the head of the Consumer Financial Protection Bureau. For 10 points, name this executive action taken to avoid the Senate confirmation process.

ANSWER: **recess appointments**

121-13-95-01127

12. An alternative to this substance's existence is Milgrom's MOND theory. Large tanks of a noble gas are used to detect this substance in the XENON experiments. Vera Rubin's observations of galactic rotation curves lent credence to its existence, and candidates for this substance include RAMBOS and WIMPS. For 10 points, identify this invisible, massive substance thought to hold galaxies together.

ANSWER: **dark matter** [do not accept "dark energy"]

234-13-95-01128

13. During this day, believers practice vidui (vee-doo-EE) in order to amend their yearly fate in the Book of Life. This day names a 1973 war between an Egypt-led Arab coalition and Israel, also known as the Ramadan War. Services on this holiday begin with the Kol Nidre (cole NEE-dray) prayer, and it marks the end of the High Holy Days. This day, marked by fasting and asking for God's forgiveness, falls nine days after the new year, Rosh Hashanah. For 10 points, name this Jewish day of atonement.

ANSWER: **Yom Kippur**

005-13-95-01129

14. Phosphorus has this molecular geometry in a phosphate anion. Every backbone atom of an alkane has this geometry. The simplest chiral compounds are formed from an atom with this geometry. Molecules with this geometry are usually drawn with a wedge and a dashed line, indicating bonds going into and out of the page. This molecular geometry is formed when an s orbital hybridizes with three p orbitals and its bond angle is 109.5 degrees. For 10 points, name this molecular geometry of methane.

ANSWER: **tetrahedral** [or **tetrahedron**]

190-13-95-01130

15. Lorenzetto sculpted the Madonna del Sasso above this man's tomb in the Pantheon in Rome. Two bored-looking cherubim appear at the bottom of his altarpiece in Piacenza (pee-uh-CHEN-zuh), the *Sistine Madonna*. His painting of the *Disputation of the Holy Sacrament* hangs directly across from his most famous fresco, which depicts Plato and Aristotle walking down a staircase, surrounded by other intellectuals. For 10 points, name this Renaissance painter of *The School of Athens*.

ANSWER: **Raphael** [or **Raffaello** Sanzio de Urbino; or **Santi**]

190-13-95-01131



1. In a play by this author, the title character woos Zenocrate, the daughter of the King of Egypt. In addition to *Tamburlaine*, this author wrote a play which is introduced by Machiavel and ends when the title character, Barabas, falls into a boiling cauldron. Another of his plays depicts a scholar who acquires magical powers by selling his soul to Mephistophilis. For 10 points, name this Elizabethan dramatist of *The Jew of Malta* and *Doctor Faustus*.

ANSWER: Christopher Marlowe

141-13-95-01132

2. Neprilysin breaks down peptides that eventually lead to this disorder. In sufferers of this disease, proteases in the ADAM-family are less active than beta and gamma secretases, which incompletely cleave APP. All Down's Syndrome patients eventually develop this disease. Defects in tau protein may lead to the formation of neurofibrillary tangles and thus this disorder. Destroying beta-amyloid plaques in the brain slows the progression of it. For 10 points, name this common form of dementia in the elderly.

ANSWER: Alzheimer's Disease [or AD]

190-13-95-01133

3. This man built Thjothhild's Church after failing to proselytize to his own father. This man's brother Thorvald was the first to encounter the "skraelingjar." He converted to Christianity at the behest of Norwegian king Olaf Tryggvason. After finding wild grapes on an expedition, he coined the name "Vinland" for what is now Nova Scotia. For 10 points, name this eleventh-century explorer, the first European to visit North America.

ANSWER: Leif Eriksson the Lucky [prompt on Eriksson]

019-13-95-01134

4. This word refers to regions of proteins that fold independently, examples of which include zinc fingers. This term is used to describe the small regions inside a ferromagnet that have uniform magnetization. In Carl Woese's (WOES's) tree of life, this word refers to the division above kingdoms, including Eukarya, Archaea, and Bacteria. For the logarithmic function, it is all real numbers greater than zero. For 10 points, name this term in mathematics that is the allowed inputs to a function, not to be confused with range.

ANSWER: domain [or protein domains; or magnetic domain; or taxonomic domains]

190-13-95-01135

5. A character in one of this man's stories states that a certain ugly bird looks like it was "made with a jack-knife." In one of his stories, Scratchy Wilson changes plans after seeing Jack Potter with his wife. This author of "The Open Boat" and "The Bride Comes to Yellow Sky" wrote of a youth who is terrified by a corpse whose face is covered by ants and joins the 304th Regiment during the Civil War. For 10 points, name this author who created Henry Fleming in *The Red Badge of Courage*.

ANSWER: Stephen Crane

189-13-95-01136

At what Ohio university were four anti-war protesters shot by National Guardsmen in 1970?

ANSWER: Kent State University

This is a calculation question. You draw three cards without replacement from a standard 52-card deck. What is the probability they are all red?

ANSWER: 2/17