



1. In this novel, Nurse Duckett's relationship with the protagonist hurts her relationship with Nurse Cramer. The protagonist of this novel uses a parachute to cover the deep wounds of Snowden. All of Egypt's cotton is purchased by Milo Minderbinder's company in this novel. Other characters in this novel include Major Major Major. For 10 points, identify this novel about the pilot Yossarian, who faces the title paradoxical situation, written by Joseph Heller.

ANSWER: Catch-22

189-12-85-23101

BONUS: What structure guarded by Heimdall is a rainbow that connects Midgard and Asgard in Norse myth?

ANSWER: Bifrost

140-12-85-2310-1

2. The libretto for this opera was written by Emanuel Schikaneder, who was in the same Masonic lodge as its composer. The antagonist of this opera must sing 30 high C's and 4 F's above high C in the aria "Der Holle Rache." In this opera, Sarastro overcomes the Queen of the Night and arranges tests for the bird catcher Papageno and the protagonist, Tamino. For 10 points, name this Wolfgang Amadeus Mozart opera about an enchanted musical instrument.

ANSWER: The Magic Flute [or Die Zauberflöte]

080-12-85-23102

BONUS: What bicycle race was won seven times in a row by Lance Armstrong?

ANSWER: Tour de France

015-12-85-2310-1

3. This substance's "pillow" type is formed underwater. Another type of this substance advances as a series of toes and lobes extruding from a cooled crust and is pahoehoe (pa-HO-ay-HO-ay). This non-solid substance can be classified into felsic, intermediate, mafic and ultramafic. When this substance solidifies, it forms igneous rock. For 10 points, identify this term for molten rock above the Earth's surface, which is expelled in many volcanic eruptions.

ANSWER: lava [prompt on magma]

066-12-85-23103

BONUS: What fundamental force is caused by exchange of W and Z bosons and is responsible for beta decay?

ANSWER: weak nuclear force [or weak interaction]

121-12-85-2310-1

4. In one play by this author, Apollo defends the protagonist at a trial declared by Athena which results in the renaming of the title figures. This man is credited with introducing the second actor to the ancient theater. Classical writers attributed *Prometheus Bound* to this playwright, whose confirmed works include *Seven Against Thebes*. For 10 points, name this ancient Greek playwright of *Agamemnon*, the first of the only surviving trilogy of its kind, the *Oresteia*.

ANSWER: Aeschylus

014-12-85-23104

BONUS: What union supported craft unionism, was founded by Samuel Gompers, and merged with a rival union in 1952?

ANSWER: **AFL** [or **American Federation of Labor**; do not accept or prompt on "AFL-CIO" or "American Federation of Labor-Congress of Industrial Organizations"]

030-12-85-2310-1

5. A Cauchy sequence in a complete metric space is automatically of this type. The root test is one method designed to test for this property. This property does not hold for arithmetic sequences or the harmonic series. All geometric series for which r is less than one exhibit this property. A sequence has this property if and only if it has a limit. For 10 points, name this property that a sequence has if its values gradually approach a certain number, the opposite of divergent.

ANSWER: **convergent** [or word forms]

131-12-85-23105

BONUS: What term can refer to, in biology, the rate of diffusion through a membrane or, in physics, the amount of a magnetic field passing through a surface?

ANSWER: **flux**

195-12-85-2310-1

6. One character in this novel inwardly rages at how his colleagues talk about a woman, "degrading her to so much mutton," concluding, "what makes it worse, she thinks of herself as meat." The protagonist of this novel isolates himself in a lighthouse after confronting the World Controller Mustapha Mond. Set in the year 632 After Ford, this novel ends with the suicide of John the Savage. For 10 points, name this dystopian novel by Aldous Huxley.

ANSWER: ***Brave New World***

014-12-85-23106

BONUS: Name the value given by multiplying a number by all the positive numbers before it, which is symbolized by an exclamation point.

ANSWER: **factorial**

023-12-85-2310-1

7. This writer created the character of Mrs. Barker, a friend of Mommy who used to work for the Bye-Bye Adoption Service. In addition to writing *The American Dream*, this man wrote about Jerry impaling himself on a knife in *The Zoo Story*. The emotionally abusive relationship between George and Martha is the subject of one of his plays, in which Nick and Honey join them for a dinner party. For 10 points, name this American playwright who wrote *Who's Afraid of Virginia Woolf?*

ANSWER: Edward **Albee** [or Edward Franklin **Albee**]

030-12-85-23107

BONUS: What phylum contains bivalve oysters, gastropods, and cephalopods such as squid?

ANSWER: **Mollusca** [or **mollusks**]

104-12-85-2310-1

8. The reason that carbenes are so reactive is they violate this principle. This principle, a consequence of Abegg's rule, is violated by compounds with trigonal bipyramidal and octahedral molecular geometries. Other exceptions to it are the electron-deficient compounds, including most of those with boron as a central atom. Violators of this rule that have five or more groups surrounding the central atom are said to have expanded valence shells. For 10 points, name this chemical rule of thumb that states that central atoms of most covalent compounds are surrounded by eight electrons.

ANSWER: **octet** rule

131-12-85-23108

BONUS: What diagram that contains the "main sequence" plots stars using two axes: luminosity, a stand-in for stellar brightness, and temperature, a stand-in for stellar color?

ANSWER: **HR** diagram [or **Hertzsprung-Russell** diagram]

104-12-85-2310-1

9. This river forms three sides of a rectangular loop named for the Ordos Desert; the fourth side of that loop is made by the Wei (WAY) River, which, with the Fen River, serves as this river's largest tributaries. This river ends in the Bohai Sea after traveling nearly 5,500 kilometers, which makes it the second-longest river in its country. For 10 points, loess (LESS) picked up by what Chinese River gives it its name and distinctive color?

ANSWER: **Yellow** River [or **Huang** He; or **Hwang** Ho]

023-12-85-23109

BONUS: This is a calculation question. What is the y intercept of the line parallel to $y=5/6x-3$ that runs through the point (4,3)?

ANSWER: **-1/3**

001-12-85-2310-1

10. Joe Trace begins an affair with the younger Dorcas in one of this author's novels. That novel, *Jazz*, takes place in Harlem. Another novel by this author begins with a character attempting to fly across Lake Superior but instead plummeting to his death the day before Milkman Dead is born. For 10 points, name this author of the novels *Song of Solomon* as well as *Sula* and *Beloved*, the first African-American woman to win the Nobel Prize in Literature.

ANSWER: Toni **Morrison** [or Chloe Anthony **Wofford**]

194-12-85-23110

BONUS: What predecessor to Mario Monti said he would run again for the Italian premiership with the People of Freedom party?

ANSWER: Silvio **Berlusconi**

121-12-85-2310-1

11. The bell of the *U.S.S. Endicott* is now found at a church within this complex, the Evergreen Chapel. This complex is the home of the Aspen Lodge, and is found within Catoctin Mountain Park near Thurmont. Originally known as Shangri-La, this location was renamed in 1953 after Dwight Eisenhower's grandson. For 10 points, name this designated rural retreat of U.S. Presidents, the site of several diplomatic summits including landmark 1978 "accords" between Egypt and Israel.

ANSWER: **Camp David**

019-12-85-23111

BONUS: James McInerney's *Bright Lights, Big City* and Italo Calvino's *If on a winter's night a traveler* both employ narration from what unusual perspective?

ANSWER: the **second person**

195-12-85-2310-1

12. Men involved in the negotiation of this treaty included Johan Adler Salvius and Johann Krane, and the Duke of Mecklenburg ceded Wismar following this agreement. Count Maximilian von Trautmansdorff represented the Holy Roman Empire during the negotiations for this agreement, which consisted of two treaties signed at Munster and Osnabruck. Innocent X's "Zelo domus Dei" condemned this agreement, which reversed Ferdinand II's Edict of Restitution. This agreement re-affirmed the Peace of Augsburg. For 10 points, identify this 1648 treaty which ended the Thirty Years' War.

ANSWER: Peace of **Westphalia**

189-12-85-23112

BONUS: This is a calculation question. The angles of a quadrilateral are an arithmetic progression, with smallest angle measuring 60 degrees. Find the next smallest angle.

ANSWER: **80** degrees

174-12-85-2310-1

13. This substance is used to explain why galaxy rotation curves do not drop off as predicted. This substance was proposed after Fritz Zwicky's observations of the Coma cluster. It contributes roughly 27 percent of the universe's energy density. Black holes and neutron stars were proposed as MACHOs, which, along with WIMPs, make up the cold form of this substance. For 10 points, name this invisible form of matter that is thought to exist in space.

ANSWER: **dark matter**

149-12-85-23113

BONUS: This is a 20-second calculation question. Find the perimeter of a 30-60-90 right triangle in which the shortest side has length 4.

ANSWER: **12 plus 4** times the square **root** of **3** [or **12 plus 4 radical 3**; or numerical equivalents]

192-12-85-2310-1

14. The fifth of these vessels successfully carried Belka and Strelka out and back. The second of these vessels was created with a small cabin that eventually overheated, causing the death of its occupant of four days named Laika. The first of these crafts stayed in orbit for a total of three months. For 10 points, name this Soviet program of satellites that first launched on October 4, 1957, and which started both the Space Age and the Space Race.

ANSWER: **Sputnik 5** [or **Sputnik 2**; or **Sputnik 1**]

023-12-85-23114

BONUS: What substances, which include mayonnaise, are colloids in which a liquid is dispersed in another liquid?

ANSWER: **emulsions**

048-12-85-2310-1

15. One poem about this conflict depicts a conversation between two dead participants and is titled "Strange Meeting." Robert Graves described this conflict in *Good-Bye to All That*. One poem about this conflict asks, "What passing bells for these who die as cattle?" Another poem about this conflict condemns "the old lie" told to its participants and describes the "ecstasy of fumbling" during a gas attack. For 10 points, name this conflict depicted by War Poets such as Siegfried Sassoon and Wilfred Owen.

ANSWER: **World War I** [or the **First World War**]

191-12-85-23115

BONUS: In paintings like *Golconda* and *The Son of Man*, Rene Magritte painted men wearing what kind of headgear?

ANSWER: **bowler hat** [or **coke hat**; or **derby**; or **billycock**; or **bombin**; prompt on **hat**]

020-12-85-2310-1

16. The title bird sits atop a wooden fence amidst a snowy landscape in this painter's work *The Magpie*. This man painted the *Poplars* and *Haystacks* series. Another series by this man showed a Gothic cathedral in different seasons and at different times of day. This painter of the *Rouen Cathedral* series moved his studio to Giverny, where he created many paintings of a plant he found floating on the garden pond. For 10 points, name this impressionist who painted many *Water Lilies*.

ANSWER: Claude **Monet**

149-12-85-23116

BONUS: Rick Scott declared a state of emergency in response to what hurricane that disrupted the 2012 Republican National Convention?

ANSWER: Hurricane **Isaac**

192-12-85-2310-1

17. The absence of this property in trans- isomers accounts for their lower boiling points as opposed to cis- isomers. The magnitude of this property is measured in debye units, or coulomb-meters (COO-lawm meters). Molecules with lone pairs on a central atom almost always have this property. Diatomic compounds of the same element never have this property. Bonds have this property if the relevant atoms have different electronegativities. For 10 points, name this property of a molecule with an uneven distribution of charge.

ANSWER: molecular **polarity** [or nonzero **dipole moment**]

131-12-85-23117

BONUS: What Leonardo painting, set in a seaside grotto, depicts Mary, Jesus, John the Baptist, and an angel sitting together?

ANSWER: **Madonna of the Rocks** [or **Virgin of the Rocks**]

195-12-85-2310-1

18. At this battle, Daniel Sickles lost his leg while his army was massacred at the Peach Orchard. Devil's Den and Culp's Hill were sites at this battle, in which James Longstreet attacked Little Round Top. One assault at this battle went up the middle of Cemetery Ridge. George Meade's army fended off the doomed Pickett's charge at this three-day Union victory. For 10 points, name this July 1863 battle in Pennsylvania that was followed by a short Abraham Lincoln address.

ANSWER: Battle of **Gettysburg**

104-12-85-23118

BONUS: Name the writer who described Clyde Griffith's murder of Roberta Alden and Caroline Meeber's trip to Chicago in his novels *An American Tragedy* and *Sister Carrie*.

ANSWER: Theodore **Dreiser**

192-12-85-2310-1

19. These things can transfer DNA from one organism to another via transduction. Reverse transcriptase is used in the reproductive cycle of "retro" ones. They can be classified as "helical" or "icosahedral" depending on the shape of the capsid surrounding their genetic material. These things can reproduce by the lytic or lysogenic cycle, and more generally by injecting their DNA into a "host" cell's genome. For 10 points, name this infectious particles that cause diseases like West Nile and influenza.

ANSWER: **viruses** [or bacteri**phages**, a subset; or **virions**]

080-12-85-23119

BONUS: Auckland, Wellington, and over three quarters of the country's population are found on what island of New Zealand?

ANSWER: the **North** Island [or **Te Ika-a-Mau**]

019-12-85-2310-1

20. One version of this effect formed the basis for the Ives-Stillwell experiment; that version was predicted by special relativity and is the transverse form. This effect is responsible for blueshift and redshift, which is an increase and decrease, respectively, in the frequency of light depending on whether the source is moving away from, or towards, an observer, respectively. For 10 points, name this effect that causes the frequency of a siren to increase as it approaches an observer.

ANSWER: **Doppler** effect [or relativistic **Doppler** effect; accept **shift** in place of **effect**]

149-12-85-23120

BONUS: This is 20-second calculation question. What is the probability that a randomly selected positive integer less than or equal to 1000 is divisible by two and four, but not eight?

ANSWER: **1/8** [or **0.125**; or **12.5 percent**]

190-12-85-2310-1



21. This author was good friends with the opera singer Olive Fremstad, who was the basis for Thea Kronborg in her novel *The Song of the Lark*. She wrote about a Pittsburgh high school student who runs away to New York and throws himself in front of a train in “Paul’s Case.” In one novel, she wrote about Jim Burden’s experiences with the Bohemian Shimerda family. For 10 points, name this novelist who wrote pioneer stories about the Nebraska prairies such as *My Antonia*.

ANSWER: Willa **Cather** [or Willa Sibert **Cather**]

015-12-85-23121

BONUS: This leader made his countrymen adopt surnames as part of his secular Six Arrows Program put in place after securing Anatolia via the Treaty of Sevres.

ANSWER: Mustafa **Kemal** Pasa [or Kemal **Ataturk**]

153-12-85-2310-1

22. In meteorology, when this phenomenon is perpendicular to isolines, the greatest advection occurs. The Beaufort scale is used to characterize this phenomenon. Transport that occurs via this process is called aeolian, which can create loess. The speed of this phenomenon can be measured with an anemometer. For 10 points, identify this flow of air between areas of different pressure, caused by the uneven heating of the Earth.

ANSWER: **wind**

066-12-85-23122