

1. Fluid movement across these entities is calculated by the Starling equation. In the kidney, the glomerulus is formed of these entities, whose activity was first observed by Marcello Malphigi. A "fenestrated" type of these allows small amounts of protein and small molecules to diffuse through it. Many of these structures are only one cell thick. Oxygen is delivered to cells by diffusing across the walls of these vessels. For 10 points, name these smallest blood vessels in the human body.

ANSWER: capillaries [or capillary; or capillary bed before mentioned]

032-09-2-01101

2. This President was nicknamed "Ice Veins" because of his cold personality. This man helped settle a boundary dispute between Great Britain and Venezuela. One controversial bill signed by this President gave disability pensions to veterans even if their injury was not from combat. This man worked with the "Billion Dollar Congress" and signed the Sherman Anti-Trust Act, the Sherman Silver Purchase Act, and the McKinley Tariff. For 10 points, name this President, the grandson of William Henry Harrison.

ANSWER: Benjamin Harrison [prompt on Harrison]

021-09-2-01102

3. These particles can undergo an inelastic scattering process described by the Klein-Nishina formula; that process consists of them losing energy when they collide with matter due to Compton Scattering. When one of these particles imparts enough energy to an electron for it to exceed the work function, that electron may be emitted from the surface of a metal in an effect described in a 1905 Einstein paper. For 10 points, name these particles which are responsible for the photoelectric effect and which are the carriers of all electromagnetic radiation, such as x-rays and light.

ANSWER: photons

028-09-2-01103

4. In one work by this author, the feminist Olive Chancellor trains Verena for a performance at the Music Hall. In another work by this author, the Pockocks comes to Paris when Chad chooses to remain with Madame Vionnet rather than return to New England. Lambert Strether is one of the title character of this author's *The Ambassadors*. Mrs. Grose is a housekeeper of an estate at Bly in another work by this author, in which ghosts named Peter Quint and Miss Jessel terrorize the children Miles and Flora. For 10 points, name this author who created Isabel Archer and wrote "The Turn of the Screw"?

ANSWER: Henry James

034-09-2-01104

5. A political cartoon about this man's nomination for president showed him sitting on a pyramid of skulls with the caption "An Available Man." This President's cabinet was dominated by his Secretary of State, who negotiated a treaty with the British diplomat Henry Bulwer, named John M. Clayton. This man died of cholera after eating strawberries and milk and was succeeded by his Vice-President, Millard Fillmore. Earlier, this President won fame by winning the Battle of Buena Vista against Santa Anna. For 10 points, name this President, nicknamed "Ol' Rough and Ready", who won the Election of 1848.

ANSWER: Zachary Taylor

021-09-2-01105

6. One of this poet's poems states "They shut me up in Prose, as when a little girl, they put me in the Closet." Another of this author's poems describes "a certain slant of light on winter afternoons." This poet also wrote a poem about a "narrow Fellow in the Grass," which was one of the few works she published during her lifetime. The speaker of one of her poems "heard a fly buzz when [she] died." The speaker of another work by this poet rides in a carriage with the titular figure and immortality. For 10 points, name this poet who wrote "Because I could not stop for Death," a woman known as the "bard of Amherst."

ANSWER: Emily Elizabeth Dickinson

024-09-2-01106

7. Cardano's method is used to find these, and Vieta's formulas give results for summing and multiplying over all of these values. Repeatedly subtracting the quotient of a function and its derivative is used in Newton's Method for approximating these. Another formula for finding these involves the discriminant " $b^2 - 4ac$ ." The Fundamental Theorem of Algebra says that a polynomial of order  $n$  has  $n$  of these, and for order two polynomials, they can be found with the quadratic formula. For 10 points, name these values that when input to a polynomial result in an output of zero.

ANSWER: polynomial roots [accept zeros before it is read]

028-09-2-01107

8. The second one of these compositions by Rachmaninoff uses long chords to imitate churchbells, and its second movement's theme was adapted into a pop song called "Full Moon and Empty Arms." Grieg's composition of this type opens with a timpani roll that leads into a fortissimo A minor chord. Maurice Ravel composed one of these in G major and another in D major for Paul Wittgenstein that is "for the left hand," and Beethoven's final one is in E flat major and is often nicknamed the "Emperor." For 10 points, name this type of composition for orchestra and solo keyboard instrument.

ANSWER: **piano concerto** [prompt on **concerto**]

032-09-2-01108

9. A disease related to this organelle is caused by a lack of hexosaminidase (HEX-ose-am-IN-ih-dace) A, characterized by a red spot in the iris, and called Tay-Sachs disease. Mannose-6-phosphate tags proteins destined for this organelle. This organelle contains namesake hydrolases and can absorb material via autophagy. This organelle's V-class proton pumps create an acidic environment to carry out its main function. For 10 points, name this organelle that breaks down macromolecules and cellular waste.

ANSWER: **lysosome**

032-09-2-01109

10. In one work by this author, the prisoner Sologdin attempts to trade his "voice encoder" for his freedom. In another of this man's novels, Pavel Rusanov, the government informer with a large tumor on his neck, is one of the figures that Oleg Kostoglov meets at the hospital. This author of *First Circle* and *The Cancer Ward* also wrote a work that begins with a trumpet signaling the awakening of the title character, who lives in a gulag labor camp. For 10 points, name this Soviet author who emigrated to the U.S. and wrote *One Day in the Life of Ivan Denisovich*.

ANSWER: Aleksandr Isayevich **Solzhenitsyn**

034-09-2-01110

11. He collaborated with Alfred Hitchcock on the set design for the dream sequence in the film *Spellbound*. His thoughts on birth and rebirth are evident in the motifs of eggs and egg-shaped objects that persist in his sculptures and paintings, as well as the decor of his home in Spain. His love for Gala, his wife, also made her a popular subject in his work. For 10 points, what twentieth-century artist is perhaps most famous for including dripping clocks in his painting *The Persistence of Memory*?

ANSWER: Salvador **Dali**

045-09-2-01111

12. Confederate forces withdrew to Corinth after this battle. This battle's second day saw the Union side reinforced with the troops of Don Carlos Buell's Army of the Ohio. The main Confederate force at this battle had recently been named the Army of the Mississippi. That army at this battle lost many troops fighting in a dense bunch of oak trees nicknamed the "hornet's nest." General Albert Sydney Johnston died during this battle. This battle was fought near Pittsburg Landing. For 10 points, name this Civil War battle fought on April 6th and 7th, 1862, in Tennessee.

ANSWER: Battle of **Shiloh** [or Battle of **Pittsburg Landing** before mentioned]

004-09-2-01112

13. This author used a line from Tennyson's "Tithonus" to title his novel in which Dr. Obispo searches for immortality for the Hollywood millionaire Jo Styte. This man's most famous novel features an inane movie titled *Three Weeks in a Helicopter*. One character in that work by this author reads from *Othello* and dates Lenina Crowne. This author created the characters Mustapha Mond and John the Savage. For 10 points, name this British author who wrote about Bernard Marx living in a soma-consuming society in his novel *Brave New World*.

ANSWER: Aldous Leonard **Huxley**

034-09-2-01113

14. This dynasty was opposed by the Liao in the north and their predecessors, the Jin, who sacked their capital of Bianjing. This dynasty was unable to unify all of China. This dynasty made its last stand at the Battle of Yamen. This dynasty was founded by Zhao Kuangyin, or Emperor Taizu. This dynasty was the first to issue paper money. Technological advances during this dynasty included the first compass and the first use of gunpowder. For 10 points, name this Chinese dynasty which emerged from the Five Dynasties and Ten Kingdoms Period, and was defeated by the founder of the Yuan Dynasty, Kublai Khan.

ANSWER: **Song** Dynasty

035-09-2-01114

15. The narrator of this author's most famous work discovers that Albertine Simonet was a lesbian after her death. That work by this author has volumes such as *Sodom and Gomorrah* and *Within a Budding Grove*, and opens with memories brought on by the consumption of a tea-soaked madeleine. For 10 points, name this French author who discussed the narrator's childhood memories in the section *Swann's Way* of his monumental work *In Search of Lost Time*.

ANSWER: Valentin Louis Georges Eugène Marcel **Proust**

034-09-2-01115

1A. Dictators like Stalin and Hitler asserted that it was part of a Zionist conspiracy. Name this language that, according to creator Ludovic Zamenhof, was created to further peace and communication.

ANSWER: **Esperanto**

1B. Upon his assimilation, he was renamed "Locutus of Borg." Name this captain of the U.S.S. Enterprise-D and Enterprise-E, portrayed by Patrick Stewart.

ANSWER: Captain Jean-Luc **Picard**

2A. Famous ones include "Do Not Go Gentle Into That Good Night." Name this poetic form consisting of five three-line stanzas and one four-line stanza that contain two refrain lines.

ANSWER: **villanelle**

2B. Name the archipelago that was first connected to the state to which it belongs by Henry Flagler's Overseas Railway. It is more famous today for its Seven-Mile Bridge.

ANSWER: Florida **Keys**

3A. Most cases result from a lack of Factor VIII, and most sufferers of this disease are male. Name this sex-linked disorder that inhibits clotting.

ANSWER: **hemophilia**

3B. Derek Freeman asserted that islanders were playing a practical joke on this anthropologist while she conducted her study of Tau island adolescents for her best-known work. Name this author of *Coming of Age in Samoa*.

ANSWER: Margaret **Mead**

4A. This is a 10-second calculation question. Multiply:  $(7x+5)(x+4)$ .

ANSWER:  **$7x^2 + 33x + 20$**

4B. This is a 10-second calculation question. Subtract:  $37/5 - 13/15$ .

ANSWER: **98/15** [or **6 8/15**]

5A. Name the group of rocks that includes basalt and obsidian and that results from the solidification of magma.

ANSWER: **igneous** rock

5B. What law of optics states that the concentration of a sample and path length through it are proportional to the sample's absorption of light?

ANSWER: **Beer-Lambert** law

6A. This is a 20-second calculation question. A woodworker needs to cut two pieces, each five and five-eighths inches long, from a one-foot-long board. How much of the board will be unused?

ANSWER: **3/4** inch

6B. This is a 20-second calculation question. Solve the system:  $7x + y = 22$  and  $-2x - y = -7$ .

ANSWER: **(3,1)** [or **x=3, y=1** or equivalent]

7A. Name the British and Sri Lankan musician whose song "Paper Planes" off her album *Kala* was featured in the film *Slumdog Millionaire*.

ANSWER: **MIA** [or Mathangi Maya **Arulpragasam**]

7B. Name the scientist and vaccination pioneer whose namesake process is used to heat and kill dangerous bacteria in foods like milk and juice.

ANSWER: Louis **Pasteur**

8A. Name the sculptor whose "stabiles" include the enormous *Flamingo*, and whose "mobiles" include the Museum of Modern Art's *Lobster Trap and Fish Tail*.

ANSWER: Alexander **Calder**

8B. Name the common metrical form used in such poems as "Shall I compare thee to a summer's day" that includes five repetitions of an unstressed syllable followed by a stressed syllable.

ANSWER: **iambic pentameter**

9A. This is a 30-second calculation question. Find the arithmetic mean of the numbers 96, 63, 25, 69, 6, and 12.

ANSWER: **45**

9B. This is a 30-second calculation question. What is the area of a trapezoid with a height of 6 inches and bases of 10 and 14 inches?

ANSWER: **72 square inches**

10A. Name the religious organization in which liberal and conservative factions have been quarreling over whether or not to permit gay marriage and the ordination of female and homosexual clerics.

ANSWER: **Anglican** Church

10B. Name the Italian prime minister who faced scandal over marital troubles stemming from his affection for an 18-year-old named Noemi Letizia.

ANSWER: Silvio **Berlusconi**

032-09-2-01116

1. This thinker described the beautiful, agreeable, good, and sublime types of the titular action in one work. This man distinguished between analytic and synthetic propositions and put forth the possibility of a priori knowledge in his most famous work. This author of *Critique of Judgement* outlined an ethical rule based in duty that states that every moral question has an absolute answer that must be followed. For 10 points, name this German Idealist philosopher who wrote *Critique of Pure Reason* and formulated the Categorical Imperative.

ANSWER: Immanuel **Kant**

005-09-2-01117

2. Georgi Chicherin signed the Treaty of Rapallo with this now defunct regime. This government faced a coup by Walter von Luttwitz and Wolfgang Kapp. The Enabling Act signaled the demise of this regime. This government was opposed by the Spartacist League in its early history. The Dawes Plan was created to help this government. This regime's downfall was brought about by the leader of the Beer Hall Putsch against it. Friedrich Ebert and Paul von Hindenburg were members of, for 10 points, which post World War I government of Germany, which was eventually replaced by the Third Reich.

ANSWER: **Weimar** Republic

035-09-2-01118

3. This writer used a Rococo-style stageset in his play centered on the Night of the Long Knives, *My Friend Hitler*. A thirteen year-old boy kills his mother's lover in this author's *The Sailor Who Fell from Grace with the Sea*. The stammering protagonist of another work by this man is traumatized when Uiko is shot by her lover and his friend Tsurukawa commits suicide. In addition to Mizoguchi, this writer created a character that is reincarnated in books like *Runaway Horses* and *Spring Snow*, part of this man's *The Sea of Fertility* tetralogy. For 10 points, what seppuku-committing author wrote *The Temple of Golden Pavilion*?

ANSWER: **Mishima** Yukio

034-09-2-01119

4. Computer graphics specialist Henrik Jensen developed a mapping algorithm that depicts this phenomenon more realistically. Depth of field is accounted for when trying to model the effects of this phenomenon in the ray tracing algorithm. For 10 points, name this phenomenon whose accurate depiction in computer science is necessary for photorealism.

ANSWER: **light**

033-09-2-01120

5. This composer parodied Clementi's didactic piano books in "Doctor Gradus ad Parnassum," part of a suite with movements like "Jimbo's Lullaby" and "Golliwogg's Cakewalk," *Children's Corner*. Another work by this composer of *Prelude for the Afternoon of a Faun* was inspired by a Paul Verlaine poem and appears in the same suite as a Menuet and Passpied. For 10 points, name this Impressionist composer of the *Suite Bergamasque*, which includes the "Clair de lune."

ANSWER: Claude **Debussy**

032-09-2-01121

6. Deviations from this law depend on whether the activity coefficient is greater than or less than one. The success of fractional distillation relies on solutions for which this law holds. Liquids that conform to this law are called perfect solutions. Deviations from this law occur when mixtures are nonideal and nonbinary, and liquids deviating from this law form azeotropes. For 10 points, name this law that states that the vapor pressure of a solution is equal to the products of the partial pressure of each component of the solution and its mole fraction.

ANSWER: **Raoult's** law

032-09-2-01122

7. One invasion under this ruler led to the death by beating of Cornelis and Johan de Witt before the treaty of Nijmegen ended the Dutch War. That war led to the ascension to power of this man's longtime enemy, William III. Charles II's granting of Spain to this ruler's grandson sparked the War of the Spanish Succession. This man revoked the rights given to Protestants in his country by Henry IV in the Edict of Nantes in his own Edict of Fontainebleau. For 10 points, name this French monarch, whose long rule led to his being named the Sun King.

ANSWER: **Louis XIV** [accept **Sun King** before read; prompt on **Louis**]

023-09-2-01123

8. In a semi-autobiographical work, this author described Leo's attempt to create the Happiness Machine and other events during Douglas Spalding's summer break. In one work by this author, Mr. Dark and Mr. Cooger try to take over Green Town with their evil carnival. In another novel by this author, Clarisse McClellan and Professor Faber help the protagonist rebel, although he is betrayed by his wife Mildred. This author of *Something Wicked This Way Comes* and *Dandelion Wine* also created fireman Guy Montag in a novel named for the temperature at which books burn. For 10 points, name this author of *Fahrenheit 451*.

ANSWER: Ray Douglas **Bradbury**

034-09-2-01124

9. This ruler seized power after the death of consuls Hirtius and Pansa. This emperor is said to have cried, "Varus, give me back my legions," after a loss to Arminius at the Battle of Teutoburg Forest. This ruler was the subject of a philippic by Cicero. This man's general Agrippa was successful in the Battle of Actium over his political opponent, who formed the Second Triumvirate with himself and Marcus Lepidus. This emperor was succeeded by Tiberius and he defeated Mark Antony and Cleopatra. For 10 points, name this first emperor of the Roman Empire, the adopted son of Julius Caesar.

ANSWER: Gaius Julius Caesar **Augustus** [or **Octavian**; or Gaius **Octavius** Thurinus]

035-09-2-01125

10. Addo Elephant National Park is located near one city in this nation, and another city includes the tourist district known as the Golden Mile. Those cities in this nation are Port Elizabeth and Durban. This nation is home to the Drakensberg Mountains and the Great Escarpment, and this nation completely surrounds the Kingdom of Lesotho. For 10 points, name this nation whose judicial capital is in Bloemfontein and whose legislative capital is in Cape Town.

ANSWER: Republic of **South Africa**

030-09-2-01126

11. He played Darrell Curtis, older brother of Sodapop and Ponyboy in *The Outsiders*, and Jed, the leader of a teenage militia battling Russian invaders in *Red Dawn*. He turned dancing skills into martial arts moves as Dalton in *Roadhouse* and played the lovely Vida in *To Wong Foo Thanks For Everything Julie Newmar*. His final role was Chet Barker in the television series *The Beast*, which he filmed while receiving treatment for pancreatic cancer. For 10 points, name this actor who danced with Baby in *Dirty Dancing*.

ANSWER: Patrick **Swayze**

045-09-2-01127

12. The formation and dissolution of this mineral created the Snowy River Cave in New Mexico. One variety of it known as Iceland Spar is used in optics, and Rasmus Bartholin discovered birefringence in one of its single crystals in 1669. It is found in metamorphic marble as well as in most stalagmites and stalactites. Along with aragonite and vaterite, it is a polymorph of calcium carbonate. For 10 points, name this mineral, the main constituent of sedimentary rocks such as limestone and of marine organisms' shells.

ANSWER: **Calcite**

040-09-2-01128

13. This person criticized the Draft Ordinance of 1906. This man led a division of stretcher bearers during a 1906 Zulu rebellion. This leader emphasized the importance of swaraj. This man supported a protest in Champaran. This leader's most famous protest was a 248-mile march to Dandi against taxes on the titular substance, known as the Salt March. For 10 points, name this man who created the concept of satyagraha, or non-violent resistance, a leader of the Indian independence movement prior to his 1948 assassination.

ANSWER: Mahatma **Gandhi** [or Mohandas Karamchand **Gandhi**]

038-09-2-01129

14. The narrator of one of this author's poems observes "Blue--blue--as if that sky let fall, a flower from its cerulean wall" In another work, this author of "To the Fringed Gentian" notes that the title figure should soon depart from his heart, even though "the abyss of heaven has swallowed up" its form. Earlier, the speaker of that poem by this author asks, "Far, through their rosy depths, dost thou pursue thy solitary way?" This poet also wrote than one should approach the grave like a person who "lies down to pleasant dreams" in his meditation on death, "Thanatopsis." For 10 points, name this early American poet of "To a Waterfowl."

ANSWER: William Cullen **Bryant**

034-09-2-01130

15. One of her sons, Parthenopaeus (PAR-then-o-PAY-us), was one of the Seven Against Thebes. This figure and her husband were turned into lions after making love in the shrine of Cybele. She was suckled by a bear as a child. She offered to marry anyone who could outrace her, but killed anyone she passed. This figure lost a race to Hippomenes by stopping three times to pick up the golden apples of the Hesperides. For 10 points, name this huntress from who took first blood from the Caldydonian Boar.

ANSWER: **Atalanta**

030-09-2-01131

1. When preceded by the word "concert," this term can be used to describe works like Beethoven's "Ah, perfido!" and Mozart's "Conservati fedele." Handel's oratorio Messiah contains three of the "da capo" variety of this form, which is named for its improvisational section. Famous examples of this form include "Vesti la Giubba" and "Largo Al Factotum," in which the Barber of Seville introduces himself as "Figaro, Figaro, Figaro." For 10 points, name this Italian term which is usually used to describe the individual songs in an opera.

ANSWER: **aria**

015-09-2-01132

2. Ring current occurs when deshielding takes place in this type of molecule. Compounds exhibiting this property tend to have  $4n + 2$  pi electrons, according to a rule named for Huckel. Specific compounds that exhibit this property include coronene and naphthalenes. Compounds with the homo- variety of this property exhibit it despite an  $sp^2$  carbon that interrupts electron delocalization across a ring. For 10 points, name this property in which systems of pi bonds are stabilized by bond conjugation, seen in benzene and the namesake smelly compounds.

ANSWER: **aromaticity**

032-09-2-01133

3. The title character of this play claims that Saturninus's words are "razors to my wounded heart." In this play, Lavinia is raped and her tongue and hands cut off to prevent her from identifying the guilty parties, who are later baked into a pie. The title character of this play captures a Gothic queen and executes her son Alarbus, incurring her vengeance. That queen is Tamora, who is the lover of Aaron the Moor in this play. For 10 points, name this play, thought to be Shakespeare's first tragedy, named for a vengeful Roman general.

ANSWER: **Titus Andronicus**

045-09-2-01134

4. The vastus intermedius attaches to the linea aspera on the posterior surface of this bone. The fovea capitis is located at the head of this bone. Its lateral epicondyle attaches to both the popliteus muscle and the fibular collateral ligament, while the medial epicondyle joins with the tibial collateral ligament. A broken hip is caused by a break in not the pelvis but this other bone. For 10 points, name this bone of the thigh, the longest bone in the body.

ANSWER: **femur** [prompt on early **thighbone**]

003-09-2-01135

5. The fourth book of this work is entitled "Of Systems of Political Economy," and argues against mercantilism. Its first section uses a pin factory to illustrate the concept of the division of labor. This work also introduced the concept that individuals pursuing their own interests promote the good of the market, which he called the "invisible hand." For 10 points, name this work published in 1776 by the economist Adam Smith.

ANSWER: An Inquiry into the Nature and Causes of the **Wealth of Nations**

024-09-2-01136