



1. The skin of organisms in this phylum is embedded with small calcareous (CAL-suh-riss) ossicles. The mouth of a group of organisms in this phylum was described by Aristotle and is known as his namesake "lantern". A madreporite (MAD-rep-ore-ite) allows fluid into a structure characteristic to this phylum, which then runs through the stone canal. Connected tube feet make up this phylum's water vascular system, enabling members to move across the ocean floor. For 15 points, identify this phylum of "spiny-skinned" marine animals such as starfish and sea urchins.

ANSWER: echinodermata [or echinoderms]

233-13-104-13101

BONUS: What British family includes Ralph, a deceased Marxist historian, David, the former Foreign Secretary, and Ed, the current leader of the Labour Party?

ANSWER: Milibands

153-13-104-1310-11

2. A 1957 concert by this man and his band at Harlem's Apollo Theater is dramatized in a biopic starring Gary Busey as this singer. One of his songs states that, "Love like yours will surely come my way, A hey, a hey hey," and is "Everyday." This man makes use of the Bo Diddley Beat in "Not Fade Away." He played in a band called The Crickets, and his hits included "That'll Be the Day" and "Peggy Sue." For 15 points, name this rock and roll pioneer who died in a 1959 plane crash with the Big Bopper and Richie Valens.

ANSWER: Charles "Buddy" Holly

030-13-104-13102

BONUS: What silent, apart from ambient noise, piece by John Cage is named for its duration?

ANSWER: 4'33"

233-13-104-1310-11

3. The owner of a mansion called Iranistan, this man sponsored legislation outlawing contraceptives in Connecticut that was overturned in the landmark *Griswold* case. This man brought the "Swedish Nightingale," Jenny Lind, to America and employed men such as General Tom Thumb and the conjoined twins Chang and Eng. For 15 points, name this man who, with James A. Bailey, founded a circus known as the Greatest Show on Earth.

ANSWER: Phineas Taylor Barnum

030-13-104-13103

BONUS: What kind of figurative language constructs a comparison using "like" or "as"?

ANSWER: simile

014-13-104-1310-11

4. One character in this poem possesses a "sparkling Cross" which "Jews might kiss, and Infidels adore." Another character journeys into the Cave of Spleen to retrieve a vial and a bag filled with negative emotions. The main character of this poem flashes "living lightning" in her eyes soon after winning a game of ombre at Hampton Court and is asleep at the beginning of this poem, until she is warned of "some dread event" by "her guardian Sylph," Ariel. The real-life Lord Petre and his suitor Arabella Fermor were parodied in this poem as the Baron and Belinda. For 15 points, name this mock-heroic epic about the thievery of some hair, written by Alexander Pope.

ANSWER: *The Rape of the Lock*

020-13-104-13104

BONUS: During the Second World War, which country was the site of the Altmark Incident and the rule of Vidkun Quisling?

ANSWER: Kingdom of Norway [or Kongeriket Norge]

153-13-104-1310-11

5. This compound inhibits prolactin secretion when it is released from the tubero-infundibular pathway. The enzyme tyrosine hydroxylase plays a key role in this neurotransmitter's synthesis. The mesolimbic and mesocortical pathways of the brain both use this neurotransmitter. Depletion of this neurotransmitter in the substantia nigra (NYE-gruh) leads to a disease characterized by shaking and other issues with movement. For 15 points, identify this neurotransmitter whose deficiency is a cause of Parkinson's disease.

ANSWER: dopamine

126-13-104-13105

BONUS: What Heian-era woman wrote the early Japanese novel *The Tale of Genji*?

ANSWER: Lady Murasaki [or Murasaki Shikibu]

014-13-104-1310-11

6. BH3-only proteins such as Bim and Bid promote this process once they are activated by Fas ligand binding its receptor. Trophic factors prevent this process from occurring. Mutant CED protein in *C. elegans* causes defects in this pathway. In eukaryotes, it is caused when Bcl-2 no longer prevents the release of cytochrome C from the mitochondria. This process results in a cascade of caspases. Damage to p53 causes this process to occur in healthy cells, though defects in it are indicative of cancer. For 15 points, name this process of programmed cell death.

ANSWER: apoptosis [prompt on cell death until it is read]

190-13-104-13106

BONUS: What data structure is first-in, first-out, as opposed stacks, which are last-in, first-out?

ANSWER: queue

066-13-104-1310-11

7. Julius Caesar described seeing men dyed with woad while twice doing this action. The last successful instance of this feat was followed by the Harrying of the North and included a battle that featured the death of several housecarls. Napoleon envisioned accomplishing this feat with balloons and a massive tunnel, and Operation Sea Lion was a failed German attempt to do this action. It was most recently performed by the king who ordered the creation of the Domesday Book. For 15 points, identify this kind of military conquest which gave William the Conqueror his name.

ANSWER: invading Britain [or invading England or other equivalents]

141-13-104-13107

BONUS: This is a 20-second calculation question. For how many values of x between π over 4 and 9 π over 4, inclusive, does $\cos x$ equal $\cos^2 x$?

ANSWER: 3

003-13-104-1310-11

8. This procedure is carried out by the DEFLATE algorithm, which combines Lempel-Ziv and Huffman coding. The .gz and .bz2 formats can be used when performing this procedure on .tar files. This procedure comes in lossy and lossless varieties, exemplified for images by the JPG and PNG standards. For 15 points, identify this procedure in computer science where input data is encoded to make it smaller, which is done when storing files in a zip archive.

ANSWER: data **compression** [or source **coding**; or **bit**-rate **reduction**; or word forms]

066-13-104-13108

BONUS: What name is given to a line or set of lines that is repeated periodically throughout a poem?

ANSWER: **refrain**

014-13-104-1310-11

9. A player from this country was nicknamed the "King" while playing for Arsenal. That player's handball foul against Ireland during the qualifier stage of World Cup 2010 went unnoticed by the referees, which allowed this country to secure a spot in the World Cup. Another player from this country head-butted Marco Materazzi in the 2006 World Cup Final. For 15 points, name this home country of Thierry Henry and Zinedine Zidane.

ANSWER: **France**

227-13-104-13109

BONUS: What American singer-songwriter has recorded the hits "Grenade," "The Lazy Song," and "Locked Out of Heaven"?

ANSWER: Bruno **Mars**

015-13-104-1310-11

10. According to the biographer Proclus, this man taught at Alexandria during the rule of Ptolemy I. He is not Plato, but he wrote a book which concludes by explaining how to construct the five Platonic solids. This man put forth the "windmill proof" of the Pythagorean theorem and wrote axioms such as "given two points there is one straight line that joins them" in his book, the *Elements*. For 15 points, name this Greek "father of geometry."

ANSWER: **Euclid** [or **Eukleides**]

019-13-104-13110

BONUS: In which 1973 war did Egypt and Syria lead a surprise attack on Israel on the Jewish Day of Atonement?

ANSWER: **Yom Kippur** War

190-13-104-1310-11

11. This hero was rescued from the sea on the island of Seriphos by the fisherman Dictys. He accidentally killed his grandfather Acrisius with a discus. He was born after his mother Danae was impregnated by Zeus as a shower of gold. This man used a helm of invisibility and the reflection from a shield to accomplish his most famous task, which resulted in the birth of Chrysaor and Pegasus. For 15 points, name this Greek hero who killed Medusa.

ANSWER: **Perseus**

186-13-104-13111

BONUS: What leader of the Jacobins published the newspaper *Defense of the Constitution* and led the Committee of Public Safety before being overthrown in the Thermidorian Reaction?

ANSWER: Maximilien de **Robespierre**

030-13-104-1310-11

12. This novel begins with the titular character deciding she will "buy the flowers herself." Peter Walsh has returned to London to secure a divorce for Daisy, a married woman he met in India and plans to marry. Septimus Smith struggles with mental illness brought on by his experiences in World War I, but he ultimately commits suicide, despite the efforts of Dr. Holmes and Sir William Bradshaw. For 15 points, what is this 1925 Virginia Woolf novel that ends with the title character's successful London party?

ANSWER: Mrs. Dalloway

045-13-104-13112

BONUS: What 1909 experiment disproved J.J. Thomson's plum pudding model and led to the discovery of the nucleus?

ANSWER: Rutherford's gold foil experiment [or Geiger-Marsden experiment; prompt on partial answers]

153-13-104-1310-11

13. The main character of this novel is afraid that she might end up in a situation similar to that of Annie Tyler and Who Flung. After kissing Johnny Taylor, this novel's protagonist is pressured by her grandmother to marry Logan Killicks. A hurricane in this novel leads to a character getting bit by a rabid dog, forcing the main character to shoot her third husband, Tea Cake. For 15 points, name this novel narrated in Eatonville, Florida, by Janie Crawford, which was written by Zora Neale Hurston.

ANSWER: Their Eyes Were Watching God

023-13-104-13113

BONUS: What English engineer created the world's first computer with his "difference engine"?

ANSWER: Charles Babbage

190-13-104-1310-11

14. 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 15 points, name this country led by Hassan Rouhani, the successor to Mahmoud Ahmadinejad.

ANSWER: Iran

232-13-104-13114

BONUS: Which Goethe character is a scholar who fathers Euphorion with Helen of Troy after seducing Gretchen and encounters Mephistopheles as a poodle?

ANSWER: Faust

186-13-104-1310-11

15. This director gave a lecture popularizing the "MacGuffin" technique. Characters in a film by this director include a sexy dancer nicknamed "Miss Torso" and the suicidal "Miss Lonelyheart." He made a film where a wheelchair bound photographer suspects his neighbor has committed murder. This director made a film where motel proprietor Norman Bates kills a woman in a shower. For 15 points, name this portly film director of movies like *Rear Window* and *Psycho*, the so-called "Master of Suspense."

ANSWER: Alfred Hitchcock

052-13-104-13115

BONUS: In what condition can the spine appear curved in the shape of an S or question mark rather than straight and which is commonly tested by bending forward in the school nurse's office?

ANSWER: scoliosis

066-13-104-1310-11

16. One of these texts tells of how the thousand-headed "Primeval Man" cut his body up into the cosmos and the different classes of humans. The Samhitas are the first parts of these texts, which include three called the "threefold knowledge" and the fourth "Atharva" one. The Upanishads (oo-PAH-nee-shods) are commentaries on these texts, which contain *mantras*. The oldest of them, containing hymns to ten gods beginning with Agni, is the Rig. For 15 points, name these oldest Sanskrit Hindu texts.

ANSWER: the **Vedas**

080-13-104-13116

BONUS: This is a 30-second calculation question. What is the cosine of the third-quadrant angle with cotangent 40/9?

ANSWER: **-40/41**

003-13-104-1310-11

17. He isn't Spanish, but this composer produced an orchestral triptych called "Iberia." This composer included "The Sunken Cathedral" and "The Girl with the Flaxen Hair" in his collection of twelve piano preludes. The third piece in this composer's *Suite bergamasque* depicts a Paul Verlaine poem about moonlight. Another of his pieces depicts a lustful mythical creature pursuing some nymphs. For 15 points, name this French composer of "Clair de Lune" and *Prelude to the Afternoon of a Faun*.

ANSWER: Achille-Claude **Debussy**

186-13-104-13117

BONUS: What American painted *Automat* and *Nighthawks*?

ANSWER: Edward **Hopper**

015-13-104-1310-11

18. This letter denotes a constant that shows how much a certain material will contract or expand to changes in temperature, the coefficient of thermal expansion. In statistics, this letter represents a Type I error. Angular acceleration is symbolized by this letter. The highest ranking member of a community of organisms has this letter designation, as does the brightest star in a constellation. For 15 points, name the first letter of the Greek alphabet.

ANSWER: **alpha**

140-13-104-13118

BONUS: What type of conic section has an eccentricity greater than one and is the shape of the graph of $x^2 - y^2 = 1$?

ANSWER: **hyperbola**

185-13-104-1310-11

19. In one poem, this man compared Cromwell's return to England with a "three-forked lightning" blasting off the head of Caesar. The speaker of another of his poems claims that his "vegetable love should grow / Vaster than empires." In that poem, the speaker imagines "deserts of vast eternity" and hears "Time's winged chariot hurrying near." For 15 points, name this poet who penned the line "Had we but world enough, and time" in his "To His Coy Mistress."

ANSWER: Andrew **Marvell**

227-13-104-13119

BONUS: Which reedless woodwind instrument was played by Jean-Pierre Rampal and Frederick the Great?

ANSWER: **flute**

040-13-104-1310-11

20. In an AC circuit, the impedance of these elements is inversely proportional to the frequency. When one of these devices is connected to an inductor, the current exhibits simple harmonic oscillation. When in parallel in a circuit, their namesake quantities add, and an early example of them was the Leyden jar. Their strength can be increased using a dielectric, and they frequently consist of a series of parallel plates. The strength of these devices is measured in farads. For 15 points, identify these circuit elements that store charge.

ANSWER: **capacitors**

226-13-104-13120

BONUS: This is a 20-second calculation question. Labels for six packages going to six different cities are randomly placed on the packages. What is the probability that each package is sent to the correct city?

ANSWER: **$\frac{1}{720}$** [prompt on **1 over 6 factorial**]

003-13-104-1310-11

21. Beams of these particles can be used in a precise, but very expensive form of cancer treatment. These particles have been theoretically predicted to have a lifetime of around ten to the thirty-sixth power years. The number of these particles in an atom increases by one in beta-minus decay. They are composed of two up quarks and a down quark. A hydrogen ion consists of one of these particles. For 15 points, name this positively charged subatomic particle that is found in the nucleus.

ANSWER: **proton** [accept **antiproton** until “thirty-sixth power”]

185-13-104-13121

BONUS: What American river runs past the city of Lake Havasu and through the Grand Canyon?

ANSWER: **Colorado** River

015-13-104-1310-11

22. This city was the original site of the company that makes CaramelCrisp popcorn, Garrett Popcorn Shops. This city is home to the three-million-gallon Abbott Oceanarium, inside its Shedd Aquarium. The Lurie Garden and Crown Fountain are both located in a park in this city, where Anish Kapoor's sculpture *Cloud Gate* sits. The Smith Museum of Stained Glass Windows and a Ferris wheel can be found on this city's Navy Pier. For 15 points, name this Midwestern city where Millennium Park is home to a stainless-steel, bean-shaped sculpture.

ANSWER: **Chicago**

023-13-104-13122

BONUS: What names the area surrounding the Pacific plate where many volcanoes are found?

ANSWER: **Ring of Fire**

228-13-104-1310-11

23. Nationalization of this country's copper industry began during the administration of Carlos Ibañez. It fought two other countries for control of nitrate deposits in the Atacama Desert in the War of the Pacific. The “tank putsch” failed to remove its first Marxist president, who was removed just a few months later in 1973. For 15 points, name this country whose president was Salvador Allende until a coup installed Augusto Pinochet.

ANSWER: **Chile**

121-13-104-13123

BONUS: What American architect built the Imperial Hotel in Japan and created a house called Fallingwater in Pennsylvania?

ANSWER: Frank Lloyd **Wright**

015-13-104-1310-11

24. In a story by this writer, Johnny is kidnapped by Bill and Sam in hopes of making some money. That story by this author ends instead with Ebenezer Dorset being paid to take his son back. This author of "The Ransom of Red Chief" also wrote a story in which twenty-one dollars is spent on a fob chain by Della after she sells her hair and her husband, Jim, sells his watch. For 15 points, name this American short story writer who used twist endings in such stories as "The Gift of the Magi."

ANSWER: O. **Henry** [or William Sidney **Porter**]

023-13-104-13124

BONUS: What longtime director of the New York Philharmonic composed the music for *West Side Story*?

ANSWER: Leonard **Bernstein**

233-13-104-1310-11

25. A poem by this writer describes some plums as "so sweet and so cold" after its speaker admits to eating them even though they were probably being saved for breakfast. This poet of "This Is Just To Say" wrote that there are "no ideas but in things" in his long poem *Paterson*. A title object in a poem by this writer is "glazed with rain water beside the white chickens." For 15 points, name this Imagist poet who claimed that "so much depends upon" the title object in "The Red Wheelbarrow."

ANSWER: William Carlos **Williams**

023-13-104-13125

00--20-1310-11

26. In Jeffrey Eugenides's novel *Middlesex*, the hermaphrodite Callie reads one of these texts, only to find the word "MONSTER." A non-fictional example of these texts contains satiric verses credited to "that learned and ingenious cleric, Father Gassalasca Jape, S.J." The author of that text styles himself a "cynic" and describes lawyers as being "skilled in the circumvention of law." George and Charles Merriam won publishing rights to a series of early 19th century American ones. For 15 points, Ambrose Bierce created a satiric "devil's" version of what kind of reference book written by Noah Webster?

ANSWER: **dictionaries** [or **word books**]

020-13-104-13126

00--20-1310-11



27. In the Cori cycle, this compound is formed in the liver. GLUT1 transports it into cells. This pyranose (PIE-rah-nose) is phosphorylated by hexokinase in the first step of the EMP pathway. Maltose consists of two monomers of it. This compound, which has only equatorial hydroxyl groups in its cyclic form, is modified to make the monomer of chitin (KITE-in). Glycogen acts as storage for this compound. Insulin responds to high blood levels of it. This compound is metabolized into two pyruvates, producing 2 ATP and 2 NADH, during glycolysis. For 15 points, name this six-carbon sugar.

ANSWER: glucose [or dextrose; or C 6-H 12-O 6]

190-13-104-13127

00--20-1310-11

28. This actor played “Pretty Boy” Floyd, who is killed by Melvin Purvis in the opening of *Public Enemies*. He wore a mask and a leash as the pet of a cannibalistic Danny McBride in *This Is the End*. In one role, this actor and Jonah Hill bust a high school drug ring as part of an undercover unit. In another movie, he and Matthew McConaughey work at the Equisite Strip Club. For 15 points, name this star of *21 Jump Street* and *Magic Mike*.

ANSWER: Channing Tatum

015-13-104-13128