

NAQTSM

National Academic Quiz Tournaments, LLC

Invitational Series #168
Packet 1

Tossups

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1. **This character is called "a regular Belasco" by an acquaintance who is surprised to discover that the books in this man's library are real, rather than "nice durable cardboard." This World War I veteran is observed gazing at a "single (*) green light" shining at the end of a dock in East Egg, as he pines for the unattainable Daisy Buchanan. For 10 points—what title character of an F. Scott Fitzgerald novel is described as "great"?**

answer: Jay Gatsby (or James Gatz or Jimmy Gatz; accept any underlined portion; accept The Great Gatsby)

<424830>

2. **In blood, this quantity is kept steady thanks to carbonic anhydrase ["car"-BAH-nik an-"HI"-drayss] enzymes. This quantity's dependence on the equilibrium constant and a ratio of two concentrations is given by the Henderson-Hasselbalch [HAH-sil-bahk] equation. (*) Methyl red and phenolphthalein [fee-nul-THAY-leen] detect changes in this quantity. For 10 points—name this quantity, the negative logarithm ["LOG-uh-rhythm"] of the hydrogen ion ["EYE"-ahn] concentration, which equals 7 for pure water.**

answer: pH (accept hydrogen ion concentration or proton concentration or H+ concentration before "negative")

<430878>

3. **This man designed Crown Hall at the Illinois Institute of Technology. Lilly Reich and this man created a black chair for the 1929 International Exposition, for which he also designed the Barcelona Pavilion. This architect of the Lake Shore Drive Apartments worked with (*) Philip Johnson on New York's Seagram Building. The phrase "less is more" was a motto of—for 10 points—what German who was the last leader of the Bauhaus ["bough-house"]?**

answer: Ludwig Mies van der Rohe [LOOT-veeg MEEZ van dair ROH-eh] (or Maria Ludwig Michael Mies; prompt on "(van der) Rohe")

<430970>

4. **This man died of yellow fever while traveling to Trinidad to sign an anti-piracy agreement with the Gran Colombia government of Simón Bolívar [see-MOHN boh-LEE-var]. His flagship, the USS *Lawrence*, was destroyed at a battle fought near (*) Put-in-Bay. A battle flag reading "don't give up the ship" was flown by—for 10 points—what naval commander, who reported that "we have met the enemy and they are ours" after winning the Battle of Lake Erie?**

answer: Oliver Hazard Perry

<436854>

5. **This poem's title character wears a uniform made from a "piece o' twisty rag." The narrator of this poem imagines taking a "swig in Hell" from the title man, who is given the order "*Panee lao*" [PAN-ee LAO]. This poem, which describes warfare "in (*) Injia's [IN-juh'z] sunny clime," ends as the narrator admits that the title character is "a better man than I am." For 10 points—name this Rudyard Kipling poem about a heroic Indian water-carrier.**

answer: Gunga Din [GUN-guh DEEN]

<294802>

6. **In July 2017 this country began closing an offshore detention center it had operated on Manus [MAN-iss] Island as part of the “PNG Solution.” It's not Mexico, but in a phone call leaked in July 2017, Donald Trump and this country's (*) prime minister discussed a deal for the U.S. to take 2,000 refugees. A 2015 Liberal Party leadership split led Malcolm Turnbull to replace Tony Abbott as leader of—for 10 points—what “down under” nation?**

answer: Australia (or Commonwealth of Australia)

<435359>

7. **Island arcs mark many boundaries named for this type of motion. This type of evolution results in analogous [uh-NAL-uh-guss] structures in unrelated organisms. This term describes the alternating harmonic series, but not the regular harmonic series. Subduction zones occur at this type of (*) plate boundary, where two tectonic plates move toward each other. For 10 points—give this term for a sequence that approaches a finite limit.**

answer: convergent (accept convergent plate boundary or convergent evolution or convergent series or convergent sequence; accept converging or convergence; accept converges before “evolution”)

<426787>

8. **A quarterback for this university won the 2003 Heisman [HYZ-man] Trophy. The following year, the second-place finisher in the Heisman voting was a running back from this university who went on to play for the Minnesota Vikings, (*) Adrian Peterson. This university won its seventh national title in 2000 under coach Bob Stoops. For 10 points—name this Big 12 university that plays home games in Norman and is nicknamed the “Sooners.”**

answer: University of Oklahoma (prompt on “Sooners” before “Sooners”; prompt on “OU”)

<431028>

9. **This country's walled city of Ait Benhaddou [“ayt” ben-HAH-doo] has been featured in multiple Hollywood films due to its red mud brick architecture. A mountainous region in the northern part of this country is known as the Rif [reef] and is home to many (*) Berbers. This country borders the Spanish exclaves of Melilla [muh-LEE-yuh] and Ceuta [say-OO-tah]. The fez hat is named after a city in—for 10 points—what North African country that contains Marrakesh [mar-uh-KESH] and Casablanca?**

answer: Morocco (or Kingdom of Morocco or al-Mamlakah al-Maghribiyah)

<425780>

10. **In Classical Greece these people were often referred to as *andrápodon* [ann-DRAP-oh-don], or “one with the feet of a man.” Examples of the privileged *oikogeneia* [“IKE-oh-JEAN”-ee-uh] class of these people include Meno [MEH-noh], who titles a Platonic dialogue. Draco [DRAY-koh] made it a (*) capital crime to kill these people. Until Solon's [SOH-lahn's] reforms, people who could not pay their debts were given this status. For 10 points—name this class of people whom the Greeks considered property.**

answer: (Athenian or Greek) slaves (accept doulos) [The Greeks used the term *andrápodon* to differentiate slaves from livestock.]

<435310>

11. **The square root of this quantity over the linear mass density is used to calculate wave velocity on a wire. This force and gravity are the only forces in an ideal Atwood machine. This force cannot have negative magnitude, as the object on which it acts would go (*) slack. This force provides the centripetal [sen-TRIP-uh-tul] acceleration when swinging a mass on a string. For 10 points—name this force exerted by pulling a wire on its ends.**

answer: tension

<427599>

12. **This type of event kills Lise Bolkanskaya [LEE-zah BOHL-kahn-SKY-uh] in *War and Peace*, as well as Agnes Fleming in *Oliver Twist*. Other victims of this kind of event include the title character of *Lolita* [loh-LEE-tah], Catherine Barkley in (*) *A Farewell to Arms*, and Catherine Earnshaw in *Wuthering Heights*. For 10 points—name this cause of death that befalls Emily Webb in *Our Town*, who is said to have had “some trouble bringing a baby into the world.”**

answer: death in childbirth or death while giving birth (accept similar answers that mention the notion of a mother dying while having a baby; do not accept or prompt on “pregnancy,” “miscarriage,” or “stillbirth”)

<427274>

13. **A recurring course in this video game series, Baby Park, requires players to complete seven laps instead of three. An item in this series uses an inverted question mark to indicate it is a (*) bomb, not a real item box.** In games in this series, the Special Cup usually ends with the brightly-colored course Rainbow Road. Explosive blue shells target players in first place in—for 10 points—what Nintendo racing series?

answer: Mario Kart (accept Super Mario Kart)

<430870>

14. **This war was interrupted by a period called the "re-adeption," in which one side's court was exiled to Bruges** [broozh]. **This war's last major battle ended after the intervention of the Stanley brothers allowed (*) Henry VII** ["the seventh"] to become the first Tudor king. The Battle of Bosworth Field was fought during—for 10 points—what 15th-century British conflict named for the red and white symbols used by the Houses of Lancaster and York?

answer: War(s) of the Roses (accept Rose Wars)

<371694>

15. **In Welsh myth, King Arthur's men hunted one of these animals that had a razor, a comb, and scissors on its head. Hercules's fourth labor involved capturing one of these animals on Mount Erymanthus** ["air"-uh-MAN-thiss]. **Frey** ["fray"] **owned a magical golden one of these animals called (*) Gullinbursti** [goo-lin-"BURST"-ee]. **Meleager** [mel-ee-AY-gur] killed one of these animals after it was wounded by Atalanta [at-uh-LAN-tuh]. For 10 points—what kind of animal was hunted by a group of heroes in Calydon [KAL-ih-don]?

answer: boars or pigs [The first sentence refers to the boar Twrch Trwyth; the second refers to the Erymanthian Boar; and the last two sentences refer to the Calydonian Boar.]

<435196>

16. **This author wrote about Eduard** [ayd-WARD], **a married man whose love for the beautiful Otilie** [oh-TEEL-yeh] **is compared to a chemical reaction, in the novel *Elective Affinities*.** **In another book by this author, the title character reads his own translation of the poet Ossian** [AH-see-un] **to a resident of (*) Wahlheim** [VAHL-hyme] **named Lotte** ["LOT-uh"]. For 10 points—what German author wrote about a man who is driven to suicide by unrequited love in *The Sorrows of Young Werther* [VAIR-tair]?

answer: Johann Wolfgang von Goethe [GUR-tuh]

<419198>

17. **Between 1847 and 1901 these people fought a Caste** ["cast"] **War against descendants of European settlers. The collapse of this civilization's Classical period in the 8th and 9th centuries involved the decline of cities such as Palenque** [pah-LAYNG-kay] **and Tikal** [tee-KAHL]. **The (*) Long Count calendar, which caused fears that the world would end in 2012, is often named after these people.** For 10 points—name this civilization that built Chichén Itzá [chee-CHEN eet-SAH].

answer: Maya [MYE-uh] or Mayan civilization (accept Mayas or Mayans; accept Mayan calendar or Mayan apocalypse)

<435807>

18. **Pencil and paper ready. Hasina needs to know the *smallest* value of x that will satisfy the expression the absolute value of the quantity $2x$ plus 4 is less than or equal to 12. By realizing that the left-hand side of the expression must be both less than or equal to 12, and *greater* than or equal to (*) negative 12, she is able to compute—for 10 points—what smallest value of x ?**

answer: $x = -8$ (do not accept or prompt on "8" or "4") [abs(2x + 4) <= 12, so -12 <= 2x + 4 <= 12, so -16 <= 2x <= 8, and -8 <= x <= 4]

<424655>

19. **In William Faulkner's *As I Lay Dying*, Vardaman is encouraged to eat this fruit instead of pondering his mother's death. It is the less starchy of two similar fruits one can fry to make the Asian snack *pisang goreng*** [pee-"SONG" goh-RENG]. **Jacobo Árbenz Guzman** [AR-baynz "goose"-MAHN] **was overthrown at the urging of a company that mainly grew this fruit in (*) Guatemala, which along with Honduras was this type of "republic."** For 10 points—name this fruit sold by Chiquita [chee-KEE-tah].

answer: bananas (accept Banana Republic after "republic"; do not accept or prompt on "plantain") [Plantains are the starchier variety that can be used in *pisang goreng*.]

<434809>

20. **In 1890 Ohio attorney general David Watson brought a lawsuit against this company. A Supreme Court case concerning this company was decided on the same day as one concerning the American Tobacco Company. A “history” of this company was written by (*) muckraker Ida Tarbell [“EYE”-duh tar-“BELL”]. In 1911 this company was dissolved for violating the Sherman Antitrust Act. For 10 points—name this petroleum company founded by John D. Rockefeller.**

answer: Standard Oil Company (accept Standard Oil Company of New Jersey vs. U.S. or The History of the Standard Oil Company)

<425873>

21. **In February 2017 Muslim groups in this city's suburbs campaigned to repair the vandalized Chesed Shel Emeth [KEH-sed “shell” EM-eth] Jewish cemetery. This city announced it would drop its 10-dollar minimum wage to comply with a “preemption law” put into effect by (*) Eric Greitens [rhymes with “titans”] in 2017. Its suburbs were the site of the December 2014 shooting of Antonio Martin and the earlier 2014 protests in Ferguson. For 10 points—name this city in Missouri.**

answer: St. Louis, Missouri

<434528>

22. **This country has the most UNESCO [yoo-NEH-skoh] World Heritage Sites, with 51. Many of M. C. Escher's early works depict this country's picturesque [“picture”-esk] Amalfi [ah-MAHL-fee] Coast. Its tourist destinations include the Dolomites [DOH-luh-mites] and the rugged cliffside villages of Cinque Terre [CHEEN-qweh TAIR-ey] on its (*) Ligurian [lih-GYOO-ree-un] Coast. The Tyrrhenian [tih-REE-nee-un] Sea contains its volcanic Aeolian [ee-OH-lee-un] Islands and its island of Capri [kuh-PREE]. Mount Etna is in—for 10 points—what country that contains Sicily?**

answer: Italy (or Italian Republic or Italia or Repubblica Italiana)

<429340>

23. **In 2015 a St. Petersburg archive was found to contain this composer's lost “Funeral Song,” which commemorated the death of his teacher Nikolai Rimsky-Korsakov [RIM-skee-KOR-suh-kawf]. This man composed a ballet in which an “Infernal Dance” is performed by Kashchei [kah-SHEE] the Immortal. A (*) riot occurred at the 1913 premiere of this man's ballet about a pagan [“PAY-gun”] human sacrifice. For 10 points—name this Russian composer of *The Firebird* and *The Rite of Spring*.**

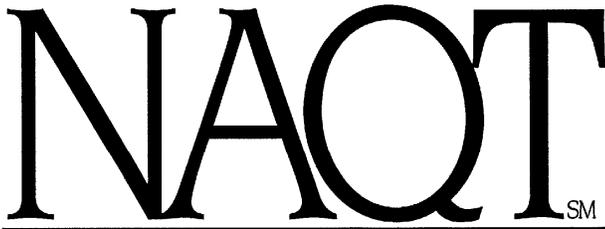
answer: Igor (Fyodorovich) Stravinsky [EE-gor struh-VIN-skee]

<408972>

24. **This disease causes red and gray hepatization [HEP-uh-“ties”-AY-shun]. A bacterium in the genus *Mycoplasma* [MYE-koh-plasma] causes an atypical, “walking” form of it. Cystic fibrosis patients are at high risk of this disease, which involves coughing up sputum [“spew-tum”]. Patients on (*) ventilators are at risk of its “hospital-acquired” form, as opposed to the “community-acquired” form. For 10 points—what disease causes inflammation of the alveoli [al-vee-OH-lye] of the lungs?**

answer: pneumonia [noo-MOHN-yuh] (prompt on “lung infection(s)” or “lung disease” before “lungs”; do not accept or prompt on “pseudomonas pneumonia”)

<431450>



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Bonuses

1. For 10 points each—answer the following about German war literature:

A. “Kat” Katczinsky [“cat”-ZIN-skee] serves as a mentor to Paul Bäumer [BOY-mur] in this World War I novel by Erich Maria Remarque [“remark”].

answer: All Quiet on the Western Front (or Im Westen nichts Neues)

B. This Romantic author's historical dramas set in wartime include his *Wallenstein* [VAH-lin-styne] trilogy, about a general in the Thirty Years' War.

answer: Friedrich Schiller (or (Johann Christoph) Friedrich von Schiller)

C. The Thirty Years' War provides the setting of this Berthold Brecht [BAIR-tohlt brekt] play whose title character loses her three children—Katrin, Eilif [“EYE”-liff], and Swiss Cheese—in the war.

answer: Mother Courage and Her Children (or Mutter Courage und ihre Kinder)

<415870>

2. For 10 points each—answer the following about Philip the Handsome:

A. He married “Joanna the Mad” to become king of this region. This kingdom united with Aragon [“AIR-uh-gone”] to form modern Spain.

answer: (Kingdom of) Castile (or Crown of Castile)

B. Philip became brother-in-law to Henry VIII [“the eighth”] after Henry married this woman, Joanna's sister and the first of Henry's six wives.

answer: Catherine of Aragon (or Catalina de Aragón; prompt on “Catherine”)

C. Philip's father-in-law was this king of Aragon who co-presided over the end of the Reconquista [ray-kohn-KEES-tah].

answer: Ferdinand (or Fernando; accept Ferdinand II)

<436234>

3. For 10 points each—answer the following about the abbreviation SAS [“S-A-S”]:

A. In mathematics, the 'S' and 'A' of the SAS congruence theorem stand for the names of these geometric elements.

answer: sides and angles (of a triangle) (accept answers in either order; accept side-angle-side)

B. The SAS, or Special Air Service, is part of the special forces of this country's military. They rescued 24 of 25 hostages during the a 1980 siege of the Iranian embassy in this country's capital city.

answer: United Kingdom of Great Britain and Northern Ireland or U.K. (accept any underlined portion; do not accept or prompt on “England”)

C. Online box scores on the official NBA website use SAS as the abbreviation for this team. It is the only team that originated in the American Basketball Association to have won an NBA championship.

answer: San Antonio Spurs (accept either underlined portion)

<427350>

4. Pencil and paper ready. A is a 2-by-2 matrix whose top row is (2, 3) ["two comma three"] and whose bottom row is (3, 5) ["three comma five"]. For 10 points each—

A. What number appears in the upper-left corner of the matrix that is the product of A times the *inverse* of A ? You have 10 seconds.

answer: 1 [The product of any matrix times its inverse is the identity matrix, which has all 1's on the main diagonal and zeroes everywhere else.]

B. A is *not* a singular matrix because what property of A is nonzero? For a 2-by-2 matrix, this property may be calculated as ad ["A-D"] minus bc ["B-C"].

answer: determinant

C. What is the trace of A , given that the trace is the sum of the entries along the main diagonal?

answer: 7 [2 + 5 = 7]

<423987>

5. The Surah [soo-rah] of the Cave was revealed to this man after rabbis from Medina [mah-DEE-nah] advised that he should be asked some questions to see whether he was making things up. For 10 points each—

A. Name this member of the Quraysh [ku-RAYSH] tribe, who received revelations from the angel Gabriel.

answer: Muhammad (ibn Abd Allah) (or Abu al-Qasim Muhammad ibn Abd Allah ibn Abd al-Muttalib ibn Hashim)

B. The Surah of the Cave tells that a ruler named Dhul-Qarnayn [thu-el-kar-NAYN] built a barrier that will keep these two monsters contained until the end times. The Book of Ezekiel prophesies a future battle against these two creatures.

answer: Gog and Magog (or Yajuj and Majuj; accept answers in either order)

C. The Surah of the Cave also tells part of the story of this earlier prophet's encounters with a wise man. The Qur'an [kuh-RAHN] also considers this man's brother, Aaron, to have been a prophet.

answer: Moses (or Musa or Moshe or Moseh or Mose or Moushe or Moyses)

<436862>

6. This man served as Barack Obama's director of the Defense Intelligence Agency from 2012 to 2014. For 10 points each—

A. Name this briefly-serving former National Security Advisor who resigned in February 2017.

answer: Michael (Thomas) Flynn (or Mike Flynn)

B. Flynn resigned in part over his December 2016 communications with this Russian ambassador to the U.S.

answer: Sergey (Ivanovich) Kislyak

C. This deputy attorney general under Barack Obama warned the White House about Flynn's relationship with the Russians. Donald Trump fired her in January 2017 for refusing to enforce his travel ban.

answer: Sally (Caroline) Yates (or Sally Caroline Quillian)

<428801>

7. The Carolingian Renaissance occurred under the rule of this son of Pepin the Short. For 10 points each—

A. Name this king of the Franks.

answer: Charlemagne [SHAR-luh-"main"] (or Charles the Great or Charles I or Carolus Magnus or Karl der Grosse; prompt on "Charles")

B. Charlemagne was given this title by Pope Leo III on Christmas Day in 800.

answer: Holy Roman Emperor (or Emperor of the Romans; prompt on "emperor"; do not accept or prompt on "Roman emperor")

C. This English scholar from York was the leading driver of the Carolingian Renaissance.

answer: Alcuin [al-KYOO-in] (of York)

<360671>

8. Much of this film is centered on its title group's inability to get along well enough to be able to morph. For 10 points each—
- A. Name this 2017 action film about five teenage superheroes, based on a long-running children's TV series.
answer: Power Rangers (do not accept or prompt on “Mighty Morphin Power Rangers”)
- B. This actor, who played Walter White on *Breaking Bad*, appears as the Power Rangers' mentor Zordon.
answer: Bryan (Lee) Cranston
- C. “Cranston” is also the surname of Billy, the film's Blue Ranger, who is the first movie superhero depicted as having this condition.
answer: autism (accept high-functioning autism or answers describing being on the autism spectrum; do not accept or prompt on “Asperger(s) syndrome”)
9. After receiving the Pawnee, this river makes a “Great Bend” to the southeast and passes through Wichita [“WITCH”-it-tah]. For 10 points each—
- A. Name this tributary of the Mississippi River. It flows past Little Rock in its namesake state.
answer: Arkansas [“ARK”-un-saw or “are-kansas”] River
- B. The Arkansas begins in this mountainous state, where it flows through the steep Royal Gorge and past the city of Pueblo [PWEB-loh] before entering the Great Plains.
answer: Colorado
- C. The Arkansas River flows past this former military post, where the “hanging judge” Isaac Parker issued rulings. It is now the second most populous city in the state of Arkansas.
answer: Fort Smith
10. This programming language popularized the printf [“print-F”] function, which uses the percent sign to indicate format specifiers. For 10 points each—
- A. Name this language used to write most of Unix [YOO-nix] operating system.
answer: C (do not accept or prompt on “C++”)
- B. In contrast to interpreted languages, C uses this type of program that converts high-level source code into machine code.
answer: compiler(s)
- C. In many C-like languages, two vertical bars indicate this logical operator.
answer: logical or (or logical disjunction; do not accept or prompt on “exclusive or”)
11. In the “Corrupt Bargain” of 1824, Henry Clay backed John Quincy Adams over this man. For 10 points each—
- A. “Old Hickory” was the nickname of what victor of the Battle of New Orleans?
answer: Andrew Jackson
- B. Jackson's first vice president was what South Carolina politician, who resigned after a dispute over nullification?
answer: John C(aldwell) Calhoun [kal-HOON]
- C. The law Calhoun wanted to nullify was the 1828 tariff given what derisive nickname by Southerners?
answer: Tariff of Abominations
12. A painting of these trees was intended as a companion piece to *The Starry Night*. For 10 points each—
- A. Name this type of Mediterranean fruit tree, the subject of 18 paintings by Vincent van Gogh.
answer: olive tree (or olives or Olea europaea)
- B. Most of van Gogh's olive tree paintings, as well as *Starry Night*, were created during his self-imposed stay at an asylum in this southern French town.
answer: Saint-Rémy-de-Provence [san-ray-MEE-duh-proh-VAWNSS]
- C. Paul Gauguin [goh-GAN] used a “Garden of Olives” in Gethsemane [geth-SEM-uh-nee] as the setting for a painting depicting this man, whom both Gauguin and van Gogh depicted with vivid red hair.
answer: Jesus (the) Christ (accept either underlined portion; accept Jesus of Nazareth or Yesua or Yeshua or Iesous; accept Christ in the Garden of Olives or Christ on the Mount of Olives or Christ au Mont des Oliviers)

13. For 10 points each—answer the following about astronomy at Harvard University:
- A. In 1973 Harvard partnered with this national institution to create a center for astrophysics. This institution runs the National Air and Space Museum.
answer: Smithsonian Institution
- B. The Harvard-Smithsonian Center for Astrophysics studied the universe's large-scale structure in two surveys named for this quantity. It is the change in the wavelength of light from receding objects.
answer: redshift (accept CfA Redshift Survey(s))
- C. The Harvard Classification Scheme puts these astronomical objects in spectroscopic classes ranging from O to M.
answer: stars (accept stellar classification)
- <436337>
14. For 10 points each—answer the following about the history of Damascus:
- A. In the 1260s BC this “great” Egyptian pharaoh [“FAIR-oh”] led a campaign against the Hittites [“HIT-tights”] through Syria, including a march on Damascus.
answer: Ramses II [RAM-zeez “the second”] (or Rameses II or Ramses the Great or Rameses the Great or Ozymandias)
- B. From 661 to the mid-8th century Damascus was the capital of this Islamic caliphate [KAL-ih-“fate”], which fell to the Abbasids [“AB”-uh-sidz] at the Battle of the Zab [zahb].
answer: Umayyad [oo-“MY”-yed] Caliphate (or Al-Hilafat al-umawiyya; accept Umayyads)
- C. In April 1947 Michel Aflaq [“off-lock”] and others founded this Arab nationalist political party in Damascus. Hafez al-Assad [HAH-fizz el-ESS-ed] later ruled Syria as a member of this party.
answer: Ba'ath [bahth or bah-ahth] Party (or Arab Socialist Ba'ath Party or Hizb Al-Ba'ath Al-'Arabi Al-Ishtiraki; accept Ba'athism or Ba'athist)
- <435669>
15. This man describes imperialism as an “altruistic” endeavor in a report to which he later adds the postscript “exterminate all the brutes!” For 10 points each—
- A. Name this ivory trader who goes mad while stationed in the interior of Africa.
answer: (Mr.) Kurtz
- B. Charles Marlow [“MAR-low”] embarks on a mission to find Mr. Kurtz in this author's novel *Heart of Darkness*.
answer: Joseph Conrad (or Józef Teodor Konrad Korzeniowski)
- C. Marlow also appears in this Conrad novel about a sailor who abandons the distressed ship *Patna*.
answer: Lord Jim
- <416983>
16. In a 1905 paper, Albert Einstein wrote that this phenomenon provided evidence for the existence of atoms. For 10 points each—
- A. Identify this random motion of particles in a fluid, such as pollen grains moving in water. It is named for a British scientist.
answer: Brownian [“BROWN”-ee-in] motion [Brownian motion is named after the scientist Robert Brown.]
- B. Brownian motion describes this process in which particles move from an area of high concentration to an area of low concentration.
answer: diffusion (accept answers indicating that particles diffuse; do not accept or prompt on “osmosis”)
- C. This German scientist proposed two namesake laws describing diffusion. His first law says that the diffusion flux is proportional to the negative of the concentration gradient [GRAY-dee-unt].
answer: Adolf Fick (accept Fick(’s) laws of diffusion)
- <416918>

17. In China, a company with a distinctive orange-colored product offers this service in a “dockless” form, and is rivals with Ofo [ˈoff-oh]. For 10 points each—
- A. What type of service is offered by Hubway in Boston, Divvy in Chicago, and a Citigroup-sponsored system in New York?

answer: bikeshare or bike-sharing (accept any reasonable answer mentioning bikes or bicycles and, possibly, the notion of sharing, rental, or a public system)

- B. Mobike and Ofo are bike-sharing companies based in this Chinese capital city.

answer: Beijing (or Peking)

- C. The world's largest bike-sharing program, with over 60,000 bicycles, is in China's city of Hangzhou [hahng-zhoh]—which in the 7th century was connected to Beijing by a “grand” one of these structures.

answer: canal (accept Grand Canal; accept da yunhe [DAH YOON-ˈhuh])

<436153>

18. For 10 points each—answer the following about Greek myths explaining the constellations:

- A. What modern Americans call the “Big Dipper” was viewed in ancient Greece as a “great” one of these furry mammals. Artemis's [ART-em-iss's] follower Callisto [kuh-LISS-toh] was turned into one of these animals.

answer: bears (or Ursidae; accept Great Bear; prompt on “Ursa”)

- B. Orion represents a warrior who was killed by one of these stinging creatures, which itself became a zodiac constellation.

answer: scorpions (or Scorpiones; prompt on “Scorpio”)

- C. According to one story, Pisces [ˈPIE-seez] represents Aphrodite [af-roh-DYE-tee] and Eros [EE-rohss], who took the form of fish to flee this monster. A fight with this creature cost Zeus [zooss] several sinews [SIN-yooz].

answer: Typhon [ˈTIE-fawn] (or Typhoeus)

<432869>

19. This pathway has been studied in the *C. elegans* [ˈC EL-uh-gahnz] embryo, in which it occurs to 113 cells. For 10 points each—

- A. Name this process that involves a “caspase [KASS-ˈpase] cascade” and a “death-inducing signaling complex.”

answer: apoptosis [AY-pop-TOH-siss]

- B. During apoptosis, this small protein is released from the mitochondria [ˈMY-toh-KAHN-dree-uh]. It normally transfers electrons between complex III [ˈthree] and complex IV [ˈfour] of the electron transport chain.

answer: cytochrome c [ˈSIGH-tuh-kroh ˈC] (or cytochrome complex; accept cyt c; prompt on “cytochrome”)

- C. Apoptosis is distinct from this process of premature or “uncontrolled” cell death due to some external event, such as hypoxia [ˈhi-POCK-see-uh] or infection.

answer: necrosis [nuh-KROH-siss]

<435366>

20. In Britain, this kind of government is the alternative to a minority government in the event of a hung parliament. For 10 points each—

- A. Name this kind of government formed from the cooperation of several political parties, none of which have a majority.

answer: coalitions (or coalition government(s))

- B. A coalition government generally refers to the makeup of this governmental branch, which includes the prime minister in parliamentary systems.

answer: executive branch

- C. A coalition can be dissolved by a parliamentary vote declaring that there is “no” amount of this concept held in the current leaders.

answer: confidence (accept confidence vote or vote of no confidence or motion of no confidence)

<435822>

21. This book includes a chapter on the “natural condition of mankind” which argues that competition, diffidence, and glory are the three causes of “quarrel” among people. For 10 points each—
- A. Name this work of political philosophy that was published in the 1650s; it is titled for a biblical monster.
answer: Leviathan [luh-VYE-uh-thun] (or The Matter, Form and Power of a Commonwealth Ecclesiastical and Civil)
- B. This English philosopher wrote *Leviathan*.
answer: Thomas Hobbes
- C. The prior chapter of *Leviathan* addresses this subject, which Hobbes thought was caused by “anxiety” about “the time to come.” David Hume wrote a set of dialogues on the “natural” form of this subject.
answer: religion (accept Dialogues Concerning Natural Religion)
- <430727>
22. One translation of this law's Latin wording is “the mutual actions of two bodies upon each other are always equal, and directed to contrary parts.” For 10 points each—
- A. Name this law of motion originally stated in the *Principia* [prin-KIP-ee-uh].
answer: Newton's third law of motion (prompt on partial answer)
- B. Newton's third law implies that this dynamic quantity is conserved; its time rate of change equals the net force on an object.
answer: (linear) momentum
- C. A more advanced treatment using Noether's [NOY-tur'z] theorem derives conservation of momentum from the fact that physical laws are independent of this property.
answer: position or location or place or spatial coordinates (accept where the experiment is performed or similar answers that mention the notion of place; accept answers mentioning invariance with respect to spatial translation; prompt on “coordinate(s)”)
- <427309>
23. For 10 points each—name these American performing venues:
- A. Abraham Lincoln was assassinated during a showing of *Our American Cousin* at this Washington, DC, theater.
answer: Ford's Theatre
- B. The Rockettes are based in this Manhattan theater, which has hosted both the Grammy and Tony Awards. Its name refers to a broadcast medium.
answer: Radio City Music Hall
- C. The Los Angeles Philharmonic performs in a theater designed by Frank Gehry [“gary”] and named for this man, whose family donated 50 million dollars for the building's construction.
answer: Walt Disney (or Walter Elias Disney; accept Walt Disney Concert Hall)
- <430766>
24. A poem about this ship claims that “many an eye has danced to see” this ship's “banner in the sky.” For 10 points each—
- A. What ship, launched in the 1790s, is described in the poem “Old Ironsides”?
answer: USS Constitution
- B. “Old Ironsides” was written by this 19th-century poet of “The Last Leaf.”
answer: Oliver Wendell Holmes Sr.
- C. Holmes also wrote this poem, whose speaker thanks the title “ship of pearl” for its “heavenly message.”
answer: The Chambered Nautilus
- <417827>