Tossup 1. What quantity, whose values on the Pauling scale range from 0.7 for francium [“france’-ee-um”] to 4.0 for fluorine, measures an atom’s attraction for bonding electrons?

answer: electronegativity (accept electronegative; do not accept or prompt on “electropositivity”)

Bonus 1. Pencil and paper ready. What is the value of 8 factorial divided by 6 factorial?

answer: 56 [8!/6! = (8 × 7 × 6!)/6! = 7 × 8 = 56]

Tossup 2. What Russian-born author of the autobiography Speak, Memory wrote about Humbert Humbert’s obsession with an adolescent girl in the novel Lolita [loh-LEE-tuh]?

answer: Vladimir (Vladimirovich) Nabokov [nah-BAW-kawf]

Bonus 2. Dillon v. Gloss upheld the constitutionality of what Constitutional amendment that enabled Prohibition?

answer: Eighteenth Amendment (or Amendment 18)

Tossup 3. Tyrone’s Rebellion took place on what island that was invaded by Oliver Cromwell in 1649 and devastated by a potato famine in the 1840s?

answer: Ireland (or Éire)

Bonus 3. Which Elizabethan playwright wrote about the scheming Barabas in The Jew of Malta?

answer: Christopher Marlowe

Tossup 4. What events, which can be classified on the moment magnitude or Modified Mercalli scales, begin below an epicenter and produce seismic waves?

answer: earthquakes (accept temblors; prompt on “tremors” or “seismic events”)

Bonus 4. “It’s raw!” is a catchphrase of what Scottish-born celebrity who hosts the reality shows Hell’s Kitchen and MasterChef?

answer: Gordon (James) Ramsay

Tossup 5. What British actor, who played the villain Deckard Shaw in the most recent Fast and Furious movie, starred with Melissa McCarthy in 2015’s Spy?

answer: Jason Statham [STAY-thum]

Bonus 5. Acetylene [uh-SEH-tuh-leen] is the simplest member of which class of hydrocarbons that have four fewer hydrogen atoms than an analogous alkane?

answer: alkynes [al-KYNE] [Acetylene is also known as ethyne.]
Tossup 6. The main product of Russia’s Rosneft and Malaysia’s Petronas [puh-TROH-nus] firms is what chief export of Venezuela and the good around which OPEC [oh-peck] formed?
answer: crude oil (or petroleum) [The “petro-“ in “Petronas” comes from petroleum.]

Bonus 6. What former Portuguese colony on the Pearl River Delta west of Hong Kong was returned to China in 1999?
answer: Macau (Special Administrative Region) (or Macao or Aomen (Tebie Xingzhengqu) or (Região Administrativa Especial de) Macau)

Tossup 7. What British scientist, who stated a version of the second law of thermodynamics also named for Max Planck [plahnk], is the namesake of an SI [“S-I”] temperature unit?
answer: Lord Kelvin (or William Thomson or 1st Baron Kelvin; accept Kelvin-Planck statement)

Bonus 7. What New Deal “administration” run by Harry Hopkins employed millions in construction and fine arts projects during the Great Depression?
answer: WPA or Works Progress Administration or Work Projects Administration

Tossup 8. What German composer, who paired his Tragic Overture with his Academic Festival Overture and wrote the Hungarian Dances, is best known for a lullaby?
answer: Johannes Brahms

Bonus 8. The relationship between antiderivatives and definite integrals is given by the second part of the “fundamental theorem of” which branch of mathematics?
answer: calculus (accept fundamental theorem of calculus)

Tossup 9. Alison Grimes lost a 2014 Senate midterm election to what man who succeeded Harry Reid as Senate majority leader in 2015, a Kentucky Republican?
answer: (Addison Mitchell) Mitch McConnell (Jr.) (prompt on “Kentucky” before “man”)

Bonus 9. What 1929 William Faulkner novel about the decline of the Compson family takes its noisy title from Macbeth?
answer: The Sound and the Fury

Tossup 10. The red supergiant star Betelgeuse (“beetle-juice”) forms a shoulder of what constellation with a three-star “belt” that is named after a hunter in Greek mythology?
answer: Orion (accept Orion’s Belt; prompt on ”(The) Hunter” before “hunter”)

Bonus 10. The 1983 invasion of what Caribbean island was referred to as a “predawn vertical insertion” by the U.S. government?
answer: Grenada [gruh-NAY-duh]

Tossup 11. What woman delays revealing the fate of a condemned merchant as she tells her husband the story of a vengeful genie in the Thousand and One Nights?
answer: Scheherazade [shuh-“hair”-uh-ZAH-D] (or Shahrzad or Sahrzåd or Seherzada)

Bonus 11. What Italian music term means to play notes in a connected manner, the opposite of staccato [stuh-KAH-toh]?
answer: legato [luh-GAH-toh]

Tossup 12. What speech, which ended with a quote from the “old Negro spiritual” “Free at last,” was given by Martin Luther King Jr. during the March on Washington?
answer: I Have a Dream speech (prompt on “King’s March on Washington speech” or similar answers before “March”)
Bonus 12. What phenomenon is said to “dilate” at relativistic speeds and has a namesake “arrow” pointing toward higher entropy in thermodynamics?
answer: time (accept time dilation or time’s arrow or arrow of time)

Tossup 13. What grammar term taken from the Latin for “to add to” is a part of speech that in English usually precedes and modifies a noun, such as “strong” or “old”?
answer: adjective(s)

Bonus 13. What term, which derives from the Greek word for “finger,” denoted a large formation of hoplites [“HOP-lights”], or Greek infantrymen who fought with spears?
answer: phalanx [FAY-lanks] (accept phalanxes or phalanges)

Tossup 14. Which physicist proclaimed ”God does not play dice with the universe,” [pause] explained Brownian motion, [pause] developed relativity, [pause] and stated “E = mc²” [“E equals M C squared”]?
answer: Albert Einstein
[The quote about God and dice was meant to express dismay about the fundamentally random worldview of quantum mechanics.]

Bonus 14. What South American city is generally called the world’s highest capital city, even though it is only a de facto capital?
answer: (Nuestra Señora de) La Paz [11,975 feet above sea level, in Bolivia]

Tossup 15. What theologian included a chapter on “The Doctrine of Election” in his The Institutes of the Christian Religion, which he revised in Geneva?
answer: John Calvin (or Jean Cauvin)

Bonus 15. Which university in Indiana made consecutive finals in the NCAA men’s basketball tournament in 2010 and 2011?
answer: Butler University (prompt on “Bulldogs”)

Tossup 16. What man, who said “what an artist dies with me” as he expired at the start of the Year of the Four Emperors, allegedly fiddled in AD 64 as Rome burned?
answer: Nero (Claudius Caesar Augustus Drusus Germanicus)

Bonus 16. In July 2015 Cecil the lion was killed by a hunter in what country whose capital is Harare [huh-RAR-ay]?
answer: (Republic of) Zimbabwe

Tossup 17. What lake fed by the Chari [SHAH-ree] River has shrunk drastically as the Sahara Desert has expanded and is near NDjamena [en-juh-MAY-nah] in its namesake African country?
answer: Lake Chad (or Lac Tchad)

Bonus 17. By what colorful nickname is Manfred von Richthofen, a World War I German ace, better known?
answer: Red Baron (do not accept or prompt on “red” or “baron”)

Tossup 18. What novelist wrote about Ona’s marriage to the immigrant Jurgis Rudkus [YOOR-gis rud-kiss] in a 1906 expose of the Chicago meatpacking industry titled The Jungle?
answer: Upton (Beall) Sinclair (Jr.)

Bonus 18. What astronomical phenomenon occurs when an object moves across the face of another, as Venus did with respect to the Sun in 2012?
answer: transit (accept transit of Venus; do not accept or prompt on “occultation” or “syzygy”)
Tossup 19. What monarch, who built the Rococo [roh-KOH-koh] palace of Sanssouci [sahn-soo-SEE], began the War of the Austrian Succession by invading Silesia [aih-LEE-zhee-uh] and was a “great” ruler of Prussia?
answer: Frederick the Great (or Frederick II of Prussia or Friedrich der Grosse or Friedrich II of Prussia; accept Frederick or Friedrich after “great”; prompt on “Frederick” or “Friedrich” before “great”)

Bonus 19. Cups, swords, wands, and pentacles are the traditional suits of cards one would find in what type of ostensibly prophetic deck?
answer: tarot deck (or tarot cards)

Tossup 20. What man, who illustrated division of labor with the example of a pin factory, created the metaphor of the invisible hand in The Wealth of Nations?
answer: Adam Smith

Bonus 20. What Beat Generation figure fictionalized himself as Sal Paradise in his novel On the Road?
answer: Jack Kerouac [‘CARE-uh-wak] (or Jean-Louis Lebris de Kerouac)

Tossup 21. Visitors cross the Propylaia [prah-“pie”-LEE-uh] to enter what historic area that houses the ruined Erechtheion [eh-REK-“theigh”-on], the Temple of Athena Nike [NYE-kee], and the Parthenon [PAR-thuh-nahn] in Athens?
answer: Athenian Acropolis [uh-KRAH-puh-lihs] (prompt on “Athens” before “landmark”)

Bonus 21. What chemistry principle holds that systems in equilibrium will react to external changes by finding a new equilibrium that counters the change?
answer: Le Châtelier’s [luh shaht-lee-YAY’Z] principle

Tossup 22. The van der Waals [vahlz] equation is an improvement on what law, derived from the kinetic theory of gases, that is usually written as PV [“P-V”] equals nRT [“N-R-T”]?
answer: ideal gas law (or universal gas law or general gas law or perfect gas law; prompt on “combined gas law” before “n”; prompt on “gas law” before “gases”)

Bonus 22. Which Asian country’s flag consisting of a blood-red disc on a green background was proudly flown by Sheikh Mujibur [MOO-jeeb-oo] Rahman at its 1971 independence?
answer: (People’s Republic of) Bangladesh (or Gana Prajatantri Bangladesh)

Tossup 23. What explorer, who in 1611 was marooned by the crew of the Discovery, gave his name to a bay in northern Canada and a river running through New York?
answer: Henry Hudson

Bonus 23. Which Dutch artist, who depicted birds transitioning into fish in Sky and Water I [“one”], also created an impossible staircase in Ascending and Descending?
answer: M(aurits) C(ornelis) Escher [EH-“sure”]

Tossup 24. In 2014 Beji Caïd Essebsi [BAH-zhee KAH-id eh-SEB-see] won a presidential election in what nation where the Arab Spring began, a country that is Africa’s northernmost?
answer: Tunisia (or Tunisian Republic or al-Jumhuriya al-Tunisiyya)

Bonus 24. What R&B singer whose albums include Evolver, Get Lifted, and Love in the Future, has had hits with “Used to Love U” and “Green Light”?
answer: John Legend (or John Roger Stephens)

Tossup 25. Pencil and paper ready. What is the maximum whole number of 45-cent stamps that Joanne can buy if she has 13 dollars available?
answer: 28 stamps [1300/45 = 28r40]
Sample TV Packet

Bonus 25. Sukarno led the independence movement of what Asian archipelago whose second president was Suharto?
answer:  (Republic of) Indonesia (or Republik Indonesia)  <271561>

Tossup 26. What author described Flemish youths who try to kill Death in a story told by a “Pardoner” to other traveling pilgrims in The Canterbury Tales?
answer: Geoffrey Chaucer [CHAW-surr]  <368174>

Bonus 26. In Charles Dickens’s A Christmas Carol, Ebenezer Scrooge is visited by how many ghosts?
answer: four ghosts [Christmas Past, Christmas Present, Christmas Future, and Jacob Marley.]  <233389>

Tossup 27. What country, which disputes the region of Nagorno-Karabakh [nah-GOR-noh-KAR-uh-bahk] with Armenia, has a coastline along the Caspian Sea that includes its capital, Baku [bah-KOO]?
answer: (Republic of) Azerbaijan [AH-zur-by-ZAHHN] (or Azerbaycan Respublikasi)  <364325>

Bonus 27. Pencil and paper ready. What is the measure of the fourth internal angle of a quadrilateral [kwahd-ruh-“lateral”] whose other internal angles are 70, 80, and 90 degrees?
answer: 120 degrees (accept 2 pi/3 radians or 2/3 pi radians; do not accept or prompt on “2/3”) [The internal angles of a quadrilateral always sum to 360 degrees, so x = 360 - (70 + 80 + 90) = 360 - 240 = 120.]  <364432>

Tossup 28. Human, All Too Human is an aphoristic work by what German philosopher, who also wrote Beyond Good and Evil and theorized about the “Übermensch” [OO-ber-menah]?
answer: Friedrich (Wilhelm) Nietzsche [NEET-shuh]  <367340>

Bonus 28. Spanish conquistador [kohn-KEESS-tah-dor] Francisco Coronado explored the American Southwest in search of which mythical golden cities often paired with Quivira [kee-VEER-ah]?
answer: Seven Cities of Cibola [SEE-buh-luh]  <230701>

Tossup 29. What medication is a beta-lactam [“beta-LAK-tam] that is used to treat syphilis and ”strept throat” and was discovered in a moldy Petri [PEE-tree] dish by Alexander Fleming?
answer: penicillin(s)  <366710>

Bonus 29. What Anglo-Indian novelist wrote both Midnight’s Children and a controversial 1988 novel titled for words allegedly said— and retracted— by Muhammad?
answer: (Ahmed) Salman Rushdie [RUSH-dee] [That second novel was The Satanic Verses.]  <228670>

Tossup 30. What poet described his AD 8 exile to the town of Tomis in Letters from the Black Sea and depicted mythological transformations in the Metamorphoses [MEH-tuh-MOR-fooh-seez]?
answer: Ovid [OH-vid] (or Publius Ovidius Naso)  <373612>

Bonus 30. The 1986 Chernobyl [chair-NOH-bul] nuclear disaster occurred in which former Soviet republic, near its northern border with Belarus [BEH-luh-rooss]?
answer: Ukraine (or Ukrayina)  <239985>

Tossup 31. What Titan—who gave his name to one of the world’s oceans— helped Heracles by fetching the golden apples while on break from holding up the heavens?
answer: Atlas [The indirect namesake of the Atlantic Ocean.]  <370203>

Bonus 31. Which British prime minister claimed “Peace for our time” after signing the 1938 Munich Agreement with Adolf Hitler?
answer: (Arthur) Neville Chamberlain  <241130>
Tossup 32. Pencil and paper ready. Two answers required. What are the two roots of the equation $x$ squared plus $11x$ plus $30$ equals zero?

answer: $x = -5$
$x = -6$ (accept answers in either order; do not accept or prompt on answers including “5” or “6”; do not accept or prompt on partial answers) [$x^2 + 11x + 30 = 0$, so $(x + 5)(x + 6) = 0$, and $x = -5$ or $x = -6$] <315889>

Bonus 32. The rapid growth of tulips makes them useful in studying what tendency of a plant to grow in the direction of sunlight?

answer: phototropism or phototropic response (prompt on “tropism” or “tropic”) <224250>

Tossup 33. What country conducted Operation Wrath of God and was led by Golda Meir [may-EER] when it was invaded by Syria and Egypt in the 1973 Yom Kippur War?

answer: (State of) Israel (or Medinat Yisra’el) <385217>

Bonus 33. What children’s author, who died in May 2012, wrote My Side of the Mountain and Julie of the Wolves?

answer: Jean Craighead George <316658>

Tossup 34. What mountain range includes Mount Assiniboine [uh-SIN-uh-BOYN], Mount Robson [ROB-sun], and Mount Alberta in its Canadian portion, and extends south into Wyoming and Colorado?

answer: Rocky Mountains (or Rockies; accept Canadian Rocky Mountains or Canadian Rockies) <367881>

Bonus 34. Funerals following the Sandy Hook shooting and Boston Marathon bombing were picketed by what anti-gay “church” whose founder, Fred Phelps, died in 2014?

answer: Westboro Baptist Church (prompt on “WBC”) <372588>

Tossup 35. In June 2014 what musical group won a case regarding the illegal use of its songs, including “Sabotage,” in commercials for Monster energy drinks?

answer: Beastie Boys <364488>

Bonus 35. What are all the possible blood types in the ABO system that could result if a man with type AB blood and a woman with type O blood have children?

answer: type A
type B (do not accept or prompt on partial answer) <216369>

Tossup 36. What man, who wrote five of the Federalist Papers, names a 1794 treaty with Great Britain and was the first Chief Justice of the Supreme Court?

answer: John Jay (accept Jay’s Treaty) [John Jay wrote 5 Federalist Papers, James Madison wrote 29, and Alexander Hamilton wrote 51.] <547994>

Bonus 36. In which 1759 satire does Dr. Pangloss repeatedly declare this to be “the best of all possible worlds” despite the ridiculous tragedies he suffers?

answer: Candide; or, Optimism) [kan-DEED] (or Candide, ou l’Optimisme) <233981>

Tossup 37. What Catalan [KAT-uh-lun] creator of Swans Reflecting Elephants and The Hallucinogenic Toreador painted melting timepieces in The Persistence of Memory?

answer: Salvador (Domingo Felipe Jacinto) Dalí [dah-LEE] (i Domènech) <321245>

Bonus 37. What squire and lover of Achilles [uh-‘KILL’-eez] borrowed Achilles’ armor and was subsequently killed by Hector in the Trojan War?

answer: Patroclus [puh-‘TROH-kluhs] <237223>

Tossup 38. Amalie [AE-muh-lee] Arena is the home of what NHL team captained by Steven Stamkos [STAM-kohss], which lost in the 2015 Stanley Cup Finals and is based in Florida?

answer: Tampa Bay Lightning (accept either underlined portion; accept Tampa) <369822>
Bonus 38. Which Bolshevik [BOHL-shuh-vik] revolutionary was exiled from Russia in 1929 and assassinated in Mexico in 1940?  
answer: Leon Trotsky (or Lev Davidovich Bronshtein)  

Tossup 39. During what battle, in which the Japanese were commanded by Tadamichi Kuribayashi [tah-dah-MEE-chee koor-ee-"by"-YAH-shee], were U.S. Marines photographed on Mount Suribachi [soo-rith-BAH-chee] raising a flag?  
answer: Battle of Iwo Jima [EE-woh JEE-muh] (accept Raising the Flag on Iwo Jima)  

Bonus 39. What physical quantity—equal to two-thirds times mass times radius squared for a hollow sphere—is considered the rotational analogue of mass?  
answer: moment of inertia (or rotational inertia; prompt on “moment” or “mass moment” or “angular mass”; do not accept or prompt on “inertia”)  

Tossup 40. What polysaccharide [pah-lee-"SACK-uh-ride"] made of repeating units of N-acetylglucosamine ["N" uh-SEE-til-gloo-KOH-suh-meen] is found in fungal cell walls and in the exoskeletons of crustaceans and insects?  
answer: chitin [KYE-tin]  

Bonus 40. In what country has a multimillion-dollar kickback scheme linked with the Petrobras [PEH-troh-brahss] oil firm led to protests with signs like “Out with Dilma” [JEEL-muh]?  
answer: (Federative Republic of) Brazil (or República Federativa do Brasil) [Dilma Rousseff is the current president of Brazil.]
A. Produces both epinephrine [ep-ih-NEF-rin] and cortisol [KOR-tih-sol]?
   answer: adrenal [uh-DREE-nul] glands (or adrenals or suprarenal glands)
B. Produces large amounts of hydrochloric acid?
   answer: stomach (accept stomach lining or fundus of the stomach; accept parietal cells; prompt on “fundus”)
C. Includes the cecum (SEE-kum), colon, and rectum?
   answer: large intestine (accept large bowel; prompt on “intestine” or “bowel”)
D. Produces bile?
   answer: liver
E. Is the largest vein in the human body?
   answer: inferior vena cava [VAY-nah KAY-vah]
F. Is also known as the tailbone?
   answer: coccyx (“COCK-six”) or coccygeal vertebra
G. Drains urine from the kidneys?
   answer: ureters [YUR-uh-turz] (do not accept or prompt on “bladder”)
H. Secretes insulin?
   answer: pancreas (accept islets of Langerhans or beta cells)
I. Has red pulp and sequesters old red blood cells?
   answer: spleen
J. Is a sac that surrounds most of the abdominal organs?
   answer: peritoneum [‘pair-ih-tuh-NEE-um] (or peritoneal membrane or peritoneal sac)
2. Animal titles. Given a work of literature with an animal in the title, name the author.
   A. *Cat on a Hot Tin Roof*
      answer: Tennessee Williams (or Thomas Lanier Williams III)
   B. “I heard a Fly buzz—when I died—”
      answer: Emily (Elizabeth) Dickinson
   C. *The Sea-Wolf*
      answer: Jack London (or John (Griffith) London or John (Griffith) Chaney)
   D. *The Taming of the Shrew*
      answer: William Shakespeare
   E. “The Elephant’s Child”
      answer: (Joseph) Rudyard Kipling
   F. *The Seagull*
      answer: Anton (Pavlovich) Chekhov
   G. “Ode to a Nightingale”
      answer: John Keats
   H. *The Frogs*
      answer: Aristophanes
   I. *Of Mice and Men*
      answer: John (Ernst) Steinbeck (Jr.)
   J. *The Lion, the Witch, and the Wardrobe*
      answer: C(live) S(taples) Lewis

   A. Mesa Verde [VAIR-dee] National Park?
      answer: Colorado
   B. Badlands National Park?
      answer: South Dakota
   C. Mammoth Cave National Park?
      answer: (Commonwealth of) Kentucky
   D. Big Bend National Park?
      answer: Texas
   E. Yosemite [yoh-SEH-mih-tee] National Park?
      answer: California
   F. Isle Royale ['royal'] National Park?
      answer: Michigan
   G. Arches National Park?
      answer: Utah
   H. Acadia National Park?
      answer: Maine
   I. Theodore Roosevelt National Park?
      answer: North Dakota
   J. Dry Tortugas ['tore-TOO'-guss] National Park?
      answer: Florida
4. Weather. Give these places or things whose names include a weather phenomenon:
A. Owen Wilson-voiced character in Pixar’s Cars
   answer: Lightning McQueen (accept either underlined portion)
B. It “comes / on little cat feet” in a Carl Sandburg poem
   answer: fog
C. Official song of the U.S. president
   answer: Hail to the Chief
D. Video game company of World of Warcraft
   answer: Blizzard (Entertainment Inc.) (accept Activision Blizzard; do not accept or prompt on “Activision”)
E. Seattle’s WNBA team
   answer: Seattle Storm
F. Apple data storage service hacked in August 2014
   answer: iCloud (do not accept or prompt on “Cloud”)
   answer: Snow Country (or Yukiguni)
H. Nickname of Iowa State’s sports teams
   answer: (Iowa State) Cyclones
I. Scorpions song that repeats “Here I am”
   answer: Rock You Like a Hurricane
J. Ray Bradbury story about a post-apocalyptic house
   answer: There Will Come Soft Rains