1. In F. Scott Fitzgerald's "Babylon Revisited," a resident of this city named Charlie Wales tries to get back his daughter Honoria. Hemingway's *A Moveable Feast* is set here, as is *The Autobiography of Alice B. Toklas*. Gertrude Stein described some residents of this city as a "lost generation," referring to the group of expatriate American artists and writers who came to live here after World War I. For 10 points, name this European capital.
ANSWER: **Paris**

015-12-85-20101

BONUS: What character fights Daniel Webster in court over the fate of the farmer Jabez Stone in a Stephen Vincent Benet short story?
ANSWER: the **Devil** [or Mr. **Scratch**]

104-12-85-2010-1

2. One king from this house was an ineffective ruler due to injuries sustained when he was kicked by a horse; that was Robert III. An attempt to restore this house to one throne it controlled included the Fifteen and Forty-Five Rebellions and was known as Jacobitism. This house's last reigning monarch was Queen Anne, whose childless death led George I of Hanover to take the throne. For 10 points, identify this ruling house of Scotland and England, whose rulers also included James I and Charles I.
ANSWER: House of **Stuart** [or **Stuart**s]

019-12-85-20102

BONUS: Identify the photo-sharing service which was purchased by Facebook for one billion dollars in April 2012 and caused controversy in December with a terms-of-service change allowing it to sell users' photos.
ANSWER: **Instagram**

019-12-85-2010-1

3. This organ is responsible for absorbing vitamin B12 because of its production of intrinsic factor with parietal cells. The mucosal lining of this organ can become the residence of *H. pylori*, which causes ulcers. This organ is connected to the duodenum by the pyloric sphincter. For 10 points, identify this digestive organ that uses enzymes and strong acids to break down food, and which is located between the esophagus and small intestine in humans.
ANSWER: **stomach**

066-12-85-20103

BONUS: Name the Dutch artist who painted *Ship of Fools* and *The Garden of Earthly Delights*.
ANSWER: Hieronymus **Bosch** [or Jheronimus van **Aken**]

088-12-85-2010-1

4. The Minkowski space includes three dimensions of space and one dimension of this quantity. This quantity is multiplied by the gamma factor to determine its namesake dilation. The derivative of position with respect to this quantity yields velocity. Entropy increases with respect to this quantity. The geologic scale for this quantity divides it into eons, eras, periods, epochs and ages. For 10 points, identify this quantity used to measure the duration of events.
ANSWER: **time**

066-12-85-20104

BONUS: What weak non-covalent interactions are responsible for holding water molecules together and for base-pairing in DNA?
ANSWER: **hydrogen** bond

5. The probability that this law is seemingly violated on small scales is given by the fluctuation theorem, which was used to explain away Loschmidt's paradox. One method of stating it sets the line integral of dQ over T around a closed path as equal to or less than zero, which is called Clausius' theorem. This law limits the maximum possible efficiency for a Carnot (CAR-nough) engine and rules out the possibility of a perpetual motion machine. For 10 points, name this law which states that the entropy of a closed system always increases.
ANSWER: **second law of thermodynamics** [accept obvious equivalents]

BONUS: The "last theorem" of what French mathematician was solved by Andrew Wiles?
ANSWER: Pierre de **Fermat**

6. At St. Augustine's Church, this organization initiated its Free Breakfast for Children program. One leader of this organization described how he raped women as an act of rebellion in his book *Soul on Ice*. This group used the phrase "What We Want What We Believe" to preface their Ten-Point program. This organization was led for a time by Eldridge Cleaver and was founded by Huey Newton and Bobby Seale in Oakland. For 10 points, name this radical black nationalist organization.
ANSWER: **Black Panther** Party for Self-Defense

BONUS: What religion is divided into "sky-clad" and "white-clad" sects and was founded by the last tirthankara (TERT-unk-ah-ruh), Mahavira?
ANSWER: **Jain**ism

7. This author's longest play opens with a prologue in the theater between a manager, a poet, and a clown. His prose works include the bildungsroman *Wilhelm Meister's Apprenticeship* and an epistolary novel about a youth who shoots himself out of unrequited love for Lotte (LAH-tuh). This author of *The Sorrows of Young Werther* (VAIR-ter) also created a scholar who impregnates and abandons Gretchen after making a pact with Mephistopheles (meff-ih-STAH-fuh-lees). For 10 points, name this German writer of the two-part drama *Faust*.
ANSWER: Johann Wolfgang von **Goethe** (GURR-tuh)

BONUS: What literary term, similar to synecdoche, refers to the substitution of something associated with an entity for the entity itself?
ANSWER: **metonymy**

8. One of this artist's paintings features a woman falling from a building through the clouds as well as her bloody corpse on the ground. Besides depicting the *Suicide of Dorothy Hale*, this artist depicted a woman with thorns around her neck and a monkey on her left shoulder. In another work, this painter featured two identical women with exposed hearts, with one woman holding a bloody pair of scissors. For 10 points, name this female Mexican painter and wife of Diego Rivera, who painted many bizarre self-portraits.
ANSWER: Frida **Kahlo** de Rivera [or Magdalena Carmen Frieda **Kahlo** y Calderon]

BONUS: Which brain region behind the brain stem is responsible for ensuring coordinated, precise movements?
ANSWER: **cerebellum**

9. This author compared Mary Datchet and Katharine Hilbery in her novel *Night and Day.* One novel by this author concludes with Lily Briscoe finishing her painting and the long-awaited trip to the title location by what remains of the Ramsay family. Another of her novels depicts the suicide of Septimus Smith and a party thrown by the title woman. For 10 points, name this female modernist author of *To the Lighthouse* and *Mrs. Dalloway.*
ANSWER: Virginia **Woolf** [or Adeline Virginia **Woolf**]

BONUS: This is a calculation question. Solve for x in 59x+33-24=45-11x.
ANSWER: x = **18/35**

10. The discoverer of these functions is John Napier. This function of a root of x is equal to this function of x divided by the order of the root. Without a horizontal shift, these functions all possess a vertical asymptote at x equals zero. This function of a quotient is equal to this function of the numerator minus this function of the denominator. e is the base of the "natural" one of these functions, written as ln (L N). Ones that do not specify a base are assumed to be base 10. For 10 points, name these functions which can be thought of as reverse exponents.
ANSWER: **log**arithms

BONUS: In what Guy de Maupassant short story do Madame Mathilde Loisel and her husband work for ten years to pay back the 36,000 francs they borrowed to replace the title object, which is revealed at the end to have been fake?
ANSWER: "The **Necklace**" [or "La **Parure**"; or "The Diamond **Necklace**"]

11. Antoine-Jean Gros painted this man visiting plague victims at Jaffa. A depiction of this man commonly shown in biographies includes a clock displaying the time of 4:13 AM and a ruffled white-on-blue outfit, suggesting that this man has been working through the night. In another painting, he is pointing to the left while looking towards the viewer and riding a bucking horse in rocky terrain. For 10 points, identify this historical figure depicted "in his study at the Tuileries" and "crossing the Alps" by Jacques-Louis David.
ANSWER: **Napoleon** Bonaparte [or **Napoleon** I; or Napoleon **Bonaparte**]

BONUS: MD5, a mostly-collision-free example, is what type of algorithm that maps a variable size input to a fixed-length string?
ANSWER: **hash** function

12. In Mandarian Chinese, this item is called a "xiangjiao" (shee-ONG-JOW). The Arabic word for this item is "moza," which inspired its neo-Latin scientific name. Another Arabic word, for "finger," is a possible source of this item's English name. Though this English word has an identical cognate in Spanish, many Mexican speakers refer to the sweet varieties as "plátanos" (PLAH-tahn-os). For 10 points, identify this fruit, which Spanish and English speakers distinguish in different manners from a plantain.
ANSWER: **banana**

BONUS: This is a 30-second calculation question. What is the area of a regular octagon with side length 2?
ANSWER: **8 plus 8** times the square **root** of **2** [or **8 plus 8 rad**ical **2**; or **8 times** the quantity **one plus** the square **root** of **2** close quantity; or mathematical equivalents]

13. One poem by this author tells of an Assyrian army that "came down like the wolf on the fold." In addition to "The Destruction of Sennacherib," this author wrote an epic poem in which the title character pursues a romance with Haidee after fleeing Spain. A poem by this author notes how "all that's best of dark and bright meet in her aspect and her eyes," describing a woman who is "like the night of cloudless climes and starry skies." For 10 points, name this British Romantic poet of *Don Juan* who died in Greece.
ANSWER: George Gordon, Lord **Byron**

BONUS: This is a 30-second calculation question. What is sine theta times cosine theta when theta equals 75 degrees?
ANSWER: **1/4** [or **0.25**]

14. Fukui believed that reactions could entirely be modeled by analyzing the so-called "frontier" ones. These entities are found by finding the radial and angular components of a certain system's wavefunctions. One type of these entities is classified by whether they are formed by adding or subtracting wavefunctions and can be bonding or antibonding. Large atoms can have g, f, and d varieties of these constructs. Smaller atoms have only s and p ones of these. For 10 points, name these approximate paths in which electrons travel around the nucleus of an atom.
ANSWER: **orbital**s [accept **molecular orbital**s before "molecular"; accept **atomic orbitals** at any time]

BONUS: Who directed the comedies *Bananas, Annie Hall,* and *Manhattan?*
ANSWER: Woody **Allen** [or Allan Stewart **Konigsberg**]

15. This character resolves to have bloody thoughts after he passes a group of soldiers heading to Poland to dispute a worthless piece of land. This character decides not to kill his enemy at prayer, since that would send him to heaven. After shouting, "How now, a rat?" he blindly thrusts his sword through an arras, killing Polonius. This character declares Prince Fortinbras to be his successor as he dies in Horatio's arms after killing Claudius. For 10 points, name this Shakespearean Prince of Denmark.
ANSWER: **Hamlet**

BONUS: What Babylonian king promulgated his namesake law code, which often punished 'an eye for an eye?'
ANSWER: **Hammurabi** [or **Hammurapi**]

16. After this event, one perpetrator attempted to commit suicide by consuming a cyanide pill and jumping into a shallow river. This event took place during a military inspection near the Latin Bridge, and it was perpetrated by a member of the Black Hand. One casualty in this action was Duchess Sophie. After this event, several European powers mobilized their armies. For 10 points, identify this incident perpetrated by Gavrilo Princip that ultimately led to World War I.
ANSWER: **assassination** of Archduke **Franz Ferdinand** [accept equivalents for "assassination"; accept additional information mentioning Duchess Sophie]

BONUS: What state is home to Mesa Verde National Park and Rocky Mountain National Park?
ANSWER: **Colorado**

17. A failed attempt to influence this issue through the courts resulted in the 2006 *Wilkinson v. Kitzinger* case. Michael Gove and Boris Johnson are among those who have endorsed this status, though Rowan Williams has spoken out against it. At the 2011 Conservative Party conference, David Cameron announced that he supports this change not "despite" but "because" of his conservatism. For 10 points, a free vote by 2015 may implement what change to marriage laws in the United Kingdom?
ANSWER: **same-sex** marriage in the United Kingdom [or **gay** marriage or other obvious equivalents; or "England" or "Wales" or the "UK" in the place of "United Kingdom" if given]

BONUS: What blind Theban prophet saw Odysseus in the underworld, changed genders, and warned Oedipus about his wife?
ANSWER: **Tiresias**

18. The baryon-to-photon ratio can be used to compute the products of the nucleosynthesis predicted by this theory. As originally posited, this theory suffers from the flatness, horizon, and monopole problems, which prompted Guth and Linde to develop inflation. This theory, which was partly confirmed by Penzias and Wilson's discovery of the CMB, was originally posited by Lemaitre after Hubble discovered redshift. For 10 points, name this theory which states that a singularity of infinite density and temperature exploded into the universe.
ANSWER: **big bang** theory

BONUS: Prokofiev's first symphony pays homage to what era of music, situated between the Baroque and Romantic eras?
ANSWER: **Classical** era

19. One of these locations features a semicircular portion known as the Garganta del Diablo, or Devil's Throat. Another one of these sites starts on the Auyan-Tepui, or Devil's Mountain, and was named for an American who crash-landed his plane nearby. The largest one of these sites creates a mist that led it to be named "The Smoke that Thunders" and occurs along the course of the Zambezi River. Iguazu, Angel, and Victoria all name, for 10 points, what areas of rapidly descending rivers?
ANSWER: **waterfall**s

BONUS: What contact force counteracts gravity and points perpendicular to and away from a surface?
ANSWER: **normal** force [prompt on $\mathbf{F_N}$]

20. In this novel, one character avoids seeing his love interest by sending a requested saddle by courier rather than delivering it in person. This novel begins by asserting, "Happy families are all alike; every unhappy family is unhappy in its own way." This novel's secondary plotline follows Levin's courtship of Kitty. After having an affair with Count Vronsky, the title character of this novel ultimately commits suicide by throwing herself in front of a train. For 10 points, name this novel by Leo Tolstoy.
ANSWER: *Anna Karenina*

BONUS: This is a 20-second calculation question. A certain raffle sells 1000 tickets, each for $20. One winner is drawn, who will receive $15,000. What is the expected value of buying a ticket?
ANSWER: **-$5** [or **lose five** dollars; or equivalents for "lose"]

21. Like rays, although unlike skates, these marine organisms exhibit ovoviviparity. These organisms use ampullae of Lorenzini to detect the electromagnetic fields of living organisms. The skin of these organisms is composed of dermal denticles, which feel like sandpaper when rubbed the wrong way. These organisms are in the class Chondrichthyes, which means they have a cartilaginous skeleton. For 10 points, identify these organisms whose well-known species include the tiger and great white.
ANSWER: **shark**s

066-12-85-20121

BONUS: What political party nominated Jill Stein for president in 2012 and received 0.36% of the popular vote?
ANSWER: **Green** Party of the United States [or **GPUS**]

052-12-85-2010-1

22. The "D-" and "L-" configurations of these molecules are distinguished in the Fischer Projection. The absence of these compounds can force the body into ketosis and accelerate the breakdown of proteins into amino acids for use in gluconeogenesis. More complex examples of these compounds are built up from several of them linked by glycosidic bonds. These compounds include chitin and starches. For 10 points, name these molecules including glucose and other sugars that are made up of hydrogen, oxygen, and carbon.
ANSWER: **Carbohydrates** [or **sugars** before it is read; or **saccharides** before it is read; or poly **saccharides**; or di**saccharides**; or mono**saccharides**]

080-12-85-20122