hsapq

1. This statement was first developed in a thought experiment involving a microscope named for its formulator, which dealt with the resolution of an electron struck by a photon. One formulation of this statement considers the product of energy and time. It states that (*) delta $x$ times delta $p$ is greater than or equal to "h" bar over 2 . For 10 points, name this law of quantum mechanics that states that a particle's position and momentum cannot both be measured to infinite accuracy.
ANSWER: Heisenberg uncertainty principle
127-12-53-05102
2. Nomarski invented a version of this device that uses differential interference contrast, and the confocal type generates three-dimensional images using fluorescence. The bright-field type can use either stained or unstained specimens, and particularly high settings may require oil-immersion lenses. (*) Compound ones have a rotating nose piece with three or four objectives, and specimens are mounted under a coverslip on a slide. For 10 points, name these instruments used to observe small samples. ANSWER: microscope

048-12-53-05103
3. In this novel, the title character insults Miss Bates at a picnic, for which she is reprimanded by the man whom she eventually becomes engaged to. A subplot involves the relationship between Jane and Frank Churchill, who is visiting Highbury. Though Harriet reveals her feelings for Mr. Knightley in this novel, she eventually accepts Robert Martin's proposal after her failed attempts at Mr. Elton. In this novel, the title daughter of the $\left(^{*}\right)$ Woodhouse family attempts unsuccessfully to play matchmaker. For 10 points, name this novel by Jane Austen.
ANSWER: Emma
4. This state's peasantry was governed by the Farmer's Laws. Its navy terrorized and annihilated invaders with a type of fire that could burn on water. This empire's army was crushed by the Turks at the Battle of Manzikert. One of its early rulers faced the Nika revolts, which were quelled by Belisarius, and created a law code called the Corpus Juris Civilis. This empire's rulers included (*) Justinian. For 10 points, name this successor state to the Roman Empire centered at Constantinople. ANSWER: Byzantine Empire [or Byzantium; or the Eastern Roman Empire before it is read]

080-12-53-05105
5. This author wrote a story about a talented pianist who rejects George Brainard's marriage proposal called "Wiser Than a God." A woman adopted by the Valmonde family flees to the swamp before learning that Armand Aubigny (OH-bin-yee) is secretly black in her story, "Desiree's Baby." Other women created by this author include the piano-playing Mademoiselle Reisz and the domesticated Adele (*) Ratignolle (RAT-in-YOLE), neither of whom can dissuade the lover of Alcee Arobin (air-oh-BAN) and Robert Lebrun from leaving her husband. For 10 points, name this author who created Edna Pontellier (pahn-TELL-ee-ay) in The Awakening.
ANSWER: Kate Chopin (show-PAN) [or Katherine O'Flaherty]
6. MIT sued this architect for deficient design of the distorted Ray and Maria Stata Center. One of this man's designs contains a "Sky Church" that pays homage to Jimi Hendrix. Another of this man's buildings curves randomly and has an exterior constructed of titanium which resembles (*) fish scales. The exterior of another of his buildings is composed of many concave panels. For 10 points, name this architect of the Experience Music Project, the Guggenheim Museum Bilbao, and the Walt Disney Concert Hall.
ANSWER: Frank Gehry
066-12-53-05107
7. Islands controlled by this country include Warbah and Bubiyan. The two largest governorates by area of this country are Al-Jahra and Al-Ahmadi. The Uqair Protocol established this country's boundary with (*) Saudi Arabia. This country has the world's fourth-largest oil reserves, and it is the site of the Burgan Field, which was set on fire in 1991. For 10 points, name this country on the Arabian Peninsula that was invaded by bordering Iraq, sparking the first Gulf War.
ANSWER: State of Kuwait
088-12-53-05108
8. Pope Paul V placed this city under interdict in 1606 . This city was temporarily given unrestricted trade privileges in the Byzantine Empire by Alexius I Comnenus in return for help against the Normans. This city ruled by the Council of Ten was attacked by the League of Cambrai. This city's demands for transporting the $\left({ }^{*}\right)$ Fourth Crusade helped lead to the sack of Constantinople. For 10 points, name this rival of Genoa, an Italian city on the Adriatic once led by doges and known for its canals. ANSWER: Venice [or Venezia]

105-12-53-05109
9. An R.E.M. album with this word as its title opens with "What's the Frequency, Kenneth?" The singer of a song with this title references another one of her works with the lyrics "I wanna 'Just Dance,' but he took me home instead," and the chorus sings "That boy is" the title word. (*) Bon Iver begins "I shoot the lights out, hide till its bright out" in a song with this title, in which Jay-Z asks what creatures including Sasquatch and Godzilla have in common. For 10 points, name this word that titles songs by Lady Gaga and Kanye West.
ANSWER: "Monster"
121-12-53-05110
10. This composer's settings of poems by Wilhelm Muller include those in his song cycle Winterreise (VIN-ter-'RYE'-za). Another of his songs is "Die Forelle" ('four'-REHL-a), which he used as the basis for a variation set that constitutes the fourth movement of one of his piano quintets. This man also used one of his own songs in his string quartet (*) "Death and the Maiden," and his eighth symphony has only two movements and is known as the "Unfinished." For 10 points, identify this Austrian composer of the "Trout" Quintet.
ANSWER: Franz Schubert
126-12-53-05111
11. Lord Cavendish discovered one member of this group by comparing the masses of different samples of nitrogen. Linus Pauling predicted that a member from this group could form a compound with six fluorine atoms. All the elements of this group are predicted to have electron affinities of zero since it would require a jump to a higher (*) energy level. Because of their extremely low reactivity, they are sometimes called inert gases. For 10 points, name this group of elements that include radon and neon.
ANSWER: noble gas [or group 18 elements before it is mentioned; prompt on inert gases]
12. The target in this event was accompanied by George Cortelyou and John Milburn. The perpetrator of this event was inspired by Emma Goldman and hid his weapon within a bandage on his hand. Thomas Edison supplied an unused $X$-ray machine in the aftermath of this event. It occurred in front of the Temple of Music at the (*) 1901 Pan-American Exposition in Buffalo. For 10 points, identify this action carried out by Leon Czolgosz that led to the succession of Theodore Roosevelt to the Presidency.
ANSWER: Assassination of William McKinley [accept equivalents that indicate McKinley being killed]
13. This poet wrote, "I have done one braver thing than all the Worthies did" in his poem "The Undertaking." The speaker remarks of his love, "That fish that is not catched thereby, alas, is wiser far than I" in this poet's "The Bait." This poet stated that "Dull sublunary lovers' love...cannot admit absence" and compared lovers to two "stiff twin (*) compasses" in "A Valediction: Forbidding Mourning." For 10 points, name this metaphysical poet who wrote a "Holy Sonnet" beginning, "Death, be not proud."
ANSWER: John Donne
014-12-53-05114
14. Expressions in postfix notation can be evaluated using one of these structures, while infix expressions require two of them. This data structure can be implemented with a linked list and a pointer to one end of the list. Commands issued by a computer program are stored on the "call" type. They may (*) overflow if too much information is stored in them. They use the "push" and "pop" operations to add and remove elements. For 10 points, name this last in, first out data structure, often contrasted with a queue.
ANSWER: stacks
132-12-53-05115
15. The protagonist of this work writes a letter to his friend's mistress so the former can spit in her face. Another character in this work, Salamano, is distraught over the death of his dog. Marie Cardona proposes to this novel's protagonist, who had already told her that he doesn't love her. Beginning, (*) "Mother died today. Or maybe yesterday," it describes how Masson and Raymond are present when the title character kills an Arab for no good reason. For 10 points, name this existential novel about Meursault (mur-SOE) written by Albert Camus (al-BAIR kah-MOO).
ANSWER: The Stranger [or The Outsider; or L'Etranger ]
131-12-53-05116
16. One ruler of this empire came to power with the help of Kautilya before passing the rule on to Bindusara. Megasthenes recorded that the first ruler of this dynasty authored the Arthashastra. Another ruler of this dynasty converted to Buddhism after trying to defeat the kingdom of Kalinga and had his (*) edicts carved into pillars written in Prakrita. For 10 points, name this Indian dynasty that overthrew the Nanda dynasty that was founded by Chandragupta and ruled for a time by Ashoka.
ANSWER: Mauryan dynasty
124-12-53-05117
17. One group within this religion is forbidden to be celibate, be circumcised, or eat Kutha, which is this religion's term for meat slaughtered by Muslims. Nama is the principle of praying in this religion, whose core prayer is the "Mool Mantra." Adult initiates to this religion are known as the (*) Khalsa, and must wear the bracelet Kara at all times and avoid cutting their hair. For 10 points, name this monotheistic religion that was founded by Guru Nanak and reads the Granth Sahib.
ANSWER: Sikhism
18. This artist made several depictions of his uncle Michel Musson's family along with a picture showing Musson's business going bankrupt titled The Cotton Exchange in New Orleans. A lonely woman stares at a glass of green liquid in his L'Absinthe (ab-SANT). Other works by this man are known for depicting large amounts of $\left(^{*}\right)$ girls in tutus practicing various dances. For 10 points, name this French impressionist painter best known for his depictions of ballerinas.
ANSWER: Edgar Degas (day-GAH)
064-12-53-05119
19. This figure was responsible for drugging the giant Talos and removing the nail holding his single vein shut, and she also gave her husband a salve that protected him against fire-breathing oxen. After killing Mermeros and Pheres, this child of Aeetes (aye-EY-teez) fled to Athens and married Aegeus (ay-JEE-us), and she had earlier sent a poisoned dress to Glauce (GLOW-say). She accompanied her future husband on the quest for the (*) Golden Fleece, along with the rest of the Argonauts. For 10 points, identify this witch and vengeful wife of Jason.
ANSWER: Medea
048-12-53-05120
20. In his later work, this man has addressed the problem of partial agency. Braess's paradox concerns how adding capacity to a network can decrease its performance when a concept named for this man is not optimal. An important model developed by this man was expanded upon by John Harsanyi, who added factors for predictability. Other examples of his idea at work are coordination $\left(^{*}\right)$ games such as the prisoner's dilemma. For 10 points, name the Princeton economist whose 1994 Nobel Prize was awarded for his work on a namesake "equilibrium" within game theory.
ANSWER: John Forbes Nash
147-12-53-05121
21. This playwright wrote of an architect's love for the title creature in The Goat, or Who Is Sylvia? He wrote another play in which one character accuses a biology professor of trying to make everyone ugly. In another work by this man, one character forces another to listen to "The Story of Jerry and the Dog." This author of The (*) Zoo Story also wrote one work in which a couple plays "Bringing up Baby." For 10 points, name this playwright who wrote of George and Martha in Who's Afraid of Virginia Woolf?
ANSWER: Edward Franklin Albee
149-12-53-05122
22. According to one equation, this quantity is proportional to the temperature times the natural logarithm of the reaction rate. That equation contains a physical constant based off collision frequency called the pre-exponential factor and is named for $\left(^{*}\right.$ ) Arrhenius (ah-RAY-nee-uhs). Transition states form when a system overcomes this barrier. Catalysts speed up reactions by lowering this quantity. For 10 points, name this quantity, the minimum energy needed for a reaction to take place. ANSWER: activation energy [prompt on energy]
23. This man defeated and annexed the Kazan Khanate and created an assembly called the zemsky sobor. Many boyars under this man were subject to mistreatment by a secret police he formed called the oprichniki. After his death, he was succeeded by his feeble son Feodor I, effectively ending the Rurikid dynasty and ushering in the (*) Time of Troubles. For 10 points, name this Russian tsar who murdered his oldest son and was known to have violent outbursts.
ANSWER: Ivan the Terrible [or Ivan IV; or Ivan Vasilyevich; or Ivan Grozny; prompt on Ivan]

## hsapq

1. This sculptor's St. Mark was initially rejected because its proportions were off. For 10 points each: [10] Name this 15th century sculptor, whose other works include a bronze, nude David.
ANSWER: Donatello [or Donato di Niccolo di Betto Bardi]
[10] Donatello designed St. Mark for the Orsanmichele in this city, where artists were sponsored by the Medici family.
ANSWER: Florence [or Firenze]
[10] Donatello also sculpted this equestrian statue of Erasmo of Narni, whose nickname means "The Honeyed Cat." The horse's hoof stands on a sphere representing the world.
ANSWER: Gattamelata
2. Located in central Romania, Transylvania was formerly the center of the Kingdom of Dacia. For 10 points each:
[10] Before uniting with Romania after World War I, Transylvania was part of this multinational realm. ANSWER: Austria-Hungary [or Austro-Hungarian Empire; or Dual Monarchy; or Oesterreich-ungarn; or Oesterreich-ungarisches Reich; or Doppelmonarchie]
[10] This royal dynasty acquired Transylvania after the Battle of Vienna in 1683.
ANSWER: Habsburgs
[10] The sovereignty of Hungary was re-established by this agreement made after Austria's defeat in the Austro-Prussian War.
ANSWER: Ausgleich [or Austro-Hungarian Compromise of 1867; or Kiegyezes]
147-12-53-05202
3. Answer these questions about epigenetics (eh-pee-geh-NEH-ticks) for 10 points each.
[10] Epigenetics focuses on these observed characteristics that results from an individual's genotype. ANSWER: phenotype
[10] One important process in epigenetics is the wrapping of DNA around these proteins found in the nucleus.
ANSWER: histones
[10] An example of epigenetics is this process that distinguishes between Prader-Willi and Angelman syndrome. This term is also used to describe baby animals following their parents.
ANSWER: imprinting
4. Free elections were promised for this country in the Yalta Conference. For 10 points each:
[10] Name this country that has been led post-World War II by Wladyslaw Gomulka and Lech Kaczynski. ANSWER: Republic of Poland [or Rzeczpospolita Polska]
[10] Another influential twentieth century Pole was this man, who served as Pope from 1978 until his death in 2005.
ANSWER: Pope John Paul II [or Karol Jozef Wojtyla; prompt on John Paul]
[10] In a 1981 appearance in Saint Peter's Square, John Paul II was shot by this Turkish assassin, who had previously murdered a Turkish journalist.
ANSWER: Mehmet Ali Agca
5. Name these philosophers who worked at Harvard College, for 10 points each.
[10] This bearded author of Pragmatism studied the need for religious faith in works such as The Will to Believe. He taught psychology and philosophy at Harvard.
ANSWER: William James
[10] This Spanish-born thinker wrote in his The Life of Reason that "Those who cannot remember the past are condemned to repeat it."
ANSWER: George Santayana [or Jorge Agustín Nicolás Ruiz de Santayana y Borrás]
[10] In the 70s, this liberal thinker argued with fellow Harvard professor Robert Nozick over his ideas of a society founded on fairness, as outlined in his A Theory of Justice.
ANSWER: John Bordley Rawls
104-12-53-05205
6. This musical work begins with pieces representing Isaiah's prophecy of salvation. For 10 points each: [10] Name this 1741 oratorio based on a libretto compiled by Charles Jennens. Inspired by the King James Bible, its best known section is the "Hallelujah Chorus," which ends its second part.
ANSWER: Messiah
[10] The Messiah was written by this German Baroque composer, who became a naturalized British subject. He also composed such pieces as Water Music and Music for the Royal Fireworks.
ANSWER: George Frideric Handel [or Georg Friedrich Handel]
[10] Handel wrote this coronation anthem for George II. Its title comes from a biblical figure who had anointed Solomon as Israel's king. This work is traditionally sung at British coronations.
ANSWER: Zadok the Priest
7. A group of people arrested in 1968 were known as the Chicago Seven. For 10 points each:
[10] The Chicago Seven protested the National Convention of this political party, whose presidents have included Woodrow Wilson and John F. Kennedy.
ANSWER: Democratic Party [or Democrats]
[10] The Chicago Seven were originally the Chicago Eight since they included Bobby Seale, one of the founders of this militant African-American organization.
ANSWER: Black Panther Party for Self-defense
[10] The Chicago Seven included this anti-war activist and prominent "Yippie" who once attempted to levitate the Pentagon.
ANSWER: Abbie Hoffman [or Abbott Hoffman]
8. One work by this economist discussed liquidity preference and the consumption function. For 10 points each:
[10] Identify this economist, whose namesake "cross" shows the equilibrium of output and aggregate demand in a national economy.
ANSWER: John Maynard Keynes
[10] Keynes wrote The Economic Consequence of Peace, which detailed his experiences as a representative of the British treasury at this meeting after World War I.
ANSWER: Versailles Conference [or Paris Peace Conference]
[10] Keynes also wrote a book titled A Treatise on this mathematical field, in which he argued that the field was based on truth values.
ANSWER: probability
9. Regarding the title place, the poet writes, "They tell me you are wicked and I believe them." For 10 points each:
[10] Name this poem about the "City of the Big Shoulders" and "Hog Butcher for the World."
ANSWER: "Chicago"
[10] "Chicago" is a poem by this man, who wrote collections such as Good Morning, America and The People, Yes. He also wrote storybooks such as Rootabaga Stories.
ANSWER: Carl Sandburg
[10] Another poet of Chicago was this woman who wrote the collections Annie Allen and A Street in Bronzeville and the poem "We Real Cool."
ANSWER: Gwendolyn Elizabeth Brooks
030-12-53-05209
10. The Hall effect is the creation of a voltage difference when one of these is applied perpendicularly to the direction of current. For 10 points each:
[10] Name these vector fields created by moving charges.
ANSWER: magnetic fields
[10] Gauss's law states the net flux through any arbitrarily defined surface of a magnetic field is zero, which prevents the existence of these objects in classical electrodynamics. Unlike all known magnets, these would have only a north or south pole, not both.
ANSWER: magnetic monopoles
[10] In differential form, Gauss's law states performing this operation on the magnetic field yields zero. This operation, represented as the dot product of del and a vector, it is the sum of the partial derivatives with respect to position.
ANSWER: divergence
121-12-53-05210
11. One character in this work frames Justine Moritz for murder and kills the protagonist's wife. For 10 points each:
[10] Name this novel about a monster created by the title man, written by Mary Shelley.
ANSWER: Frankenstein
[10] Frankenstein opens with a series of letter from this explorer written to his sister. This explorer discovers Victor Frankenstein on the ice.
ANSWER: Robert Walton [or Robert Walton]
[10] The monster also kills this friend of Victor's, for which Victor is blamed after he dumps the corpse of his second creation in the lake.
ANSWER: Henry Clerval [or Henry Clerval]
124-12-53-05211
12. The eastern portion of this mountain range is called the Tell, and the Great Western Erg is just to its south. For 10 points each:
[10] Name this range whose highest peak is Jebel Toubkal. A now-extinct subspecies of bear named after this range was its continent's only variety of bear.
ANSWER: Atlas Mountains
[10] Most of the Atlas Mountains lie in Algeria and this country to its west. This country's cities include Agadir, Tangier, and Rabat.
ANSWER: Morocco
[10] The Atlas Mountains lie between the Mediterranean Sea and this desert.
ANSWER: Sahara Desert
13. This artist depicted William Pitt's sudden collapse in a painting that includes portraits of 55 British nobles, The Death of the Earl of Chatham. For 10 points each:
[10] Name this artist of The Death of Major Pierson, who depicted his half-brother Henry Pelham in Boy with a Squirrel.
ANSWER: John Singleton Copley
[10] This Copley painting depicts a boy swimming nude being approached by the title creature, which a man in a nearby boat is preparing to spear.
ANSWER: Watson and the Shark
[10] Copley also did a portrait of this silversmith, better-known for his "Midnight Ride."
ANSWER: Paul Revere
080-12-53-05213
14. Cuban governor Diego Velasquez de Cuellar recalled this man's expedition, but this man ignored the order. For 10 points each:
[10] Name this Spanish conquistador who toppled the Aztec Empire, thus bringing present-day Mexico under Spanish control.
ANSWER: Hernan Cortes
[10] Cortes captured this Aztec emperor, who believed Cortes to be the Aztec deity Quetzalcoatl. After this man's death, the Aztecs massacred many of Cortes' men on La Noche Triste.
ANSWER: Montezuma II [or Moctezuma II]
[10] This Aztec woman served as Cortes' translator and bore him a son. Because of her dealings with the Spanish, her name is today synonymous in Mexican culture with treachery and betrayal.
ANSWER: La Malinche [or Dona Marina]
079-12-53-05214
15. This god's servants fought off Apep every night, when he journeyed into the underworld on his barque.

For 10 points each:
[10] Name this Egyptian solar deity and supreme god.
ANSWER: Ra [or Re]
[10] In another myth, Ra enters this god's mouth every night and exits her when he is born in the morning. This sky goddess is the consort of Geb.
ANSWER: Nut [do not accept "Tefnut"]
[10] This god helps protect Ra on the solar barque. He chopped his brother up into fourteen pieces.
ANSWER: Set [or Seth; or Setesh; or Suty; or Sutekh]
080-12-53-05215
16. Claude Shannon borrowed this term to denote the average amount of information contained in a random variable. For 10 points each:
[10] Name this state variable, measured in Joules per Kelvin, that measures the amount of disorder in a system.
ANSWER: entropy [prompt on $\underline{\mathbf{S}}$ ]
[10] The Second Law of Thermodynamics states that entropy is always increasing in this kind of system, in which work and heat but not matter can be transferred in and out of the system.
ANSWER: closed system
[10] This Austrian scientist defined entropy as a namesake constant times the natural $\log$ of the number of microstates of a system. That equation is seen on his tombstone.
ANSWER: Ludwig Eduard Boltzmann
17. Scientists are always looking for extraterrestrial life. Name some locations that they have deemed the likeliest to have life, for 10 points each:
[10] This red planet is often cited as a location where life used to exist, primarily due to the number of physical features that show that this planet once had water on its surface.
ANSWER: Mars
[10] This moon of Jupiter is said to have a subterranean ocean beneath its smooth icy surface as well as a form of plate tectonics driven by tidal forces between it and Jupiter.
ANSWER: Europa
[10] This moon of Saturn was found by the Cassini probe to have plumes on its southern hemisphere that had large water contents, showing it was geologically active.
ANSWER: Enceladus (en-seh-LAH-duhs)
18. This character shoots himself while wearing a "blue dress coat with a yellow waistcoat," and "no clergyman attended" his funeral. For 10 points each:
[10] Name this character, who commits suicide over his unrequited love for Albert's fiancée, Lotte.
ANSWER: Young Werther (VER-ter)
[10] Werther's predicament was inspired by this author's unrequited love for Charlotte Buff. This author of Faust was a leading author of the Sturm und Drang movement.
ANSWER: Johann Wolfgang von Goethe (GER-tuh)
[10] Werther reads to Lotte from his translation of this "son of Fingal," a fake Irish bard created by James MacPherson.
ANSWER: Ossian
19. Helen Burns, who represents the author's sister Maria, dies of consumption in the arms of this novel's title character. For 10 points each:
[10] Name this novel by Charlotte Bronte, about an orphaned girl who eventually marries Edward Rochester.
ANSWER: Jane Eyre
[10] This is the name of the residence of Rochester, where Jane Eyre works as a governness.
ANSWER: Thornfield Hall
[10] The most enigmatic character in Jane Eyre is this "madwoman in the attic," Rochester's first wife, who is treated sympathetically in Jean Rhys's novel Wide Sargasso Sea.
ANSWER: Bertha Mason [or Bertha Mason; prompt on Mason]
20. An owner of the New Jersey Nets has said he will run against this man in the 2012 presidential election. For 10 points each:
[10] Name this man, currently the prime minister of Russia, who served as its president until term limits forced him down and Dmitry Medvedev took his place.
ANSWER: Vladimir Putin
[10] Putin is a member of this party. After this party barely won parliamentary elections in December 2011, there were allegations of fraud and calls for Putin to resign.
ANSWER: United Russia [or Yedínaya Rossíya]
[10] Putin was designated as the successor to this post-Soviet Russian president through much of the 1990s during this man's unexpected New Year's Eve 1999 retirement speech.
ANSWER: Boris Yeltsin
21. This novel is narrated by fifteen characters over the course of fifty-nine chapters. For 10 points each: [10] Name this novel about the misadventures of the Bundren family as they travel towards Jefferson to bury Addie.
ANSWER: As I Lay Dying
[10] As I Lay Dying is one of the works of this Southern writer whose other novels include The Sound and the Fury and Light in August.
ANSWER: William Cuthbert Faulkner
[10] Many of William Faulkner's works are set in this fictional Mississippi county. ANSWER: Yoknapatawpha County

