

1. The temperature dependence of the change in this quantity is given by Kirchoff's law in terms of the change in specific heat. The change in this quantity when dissolving a substance at infinite dilution is zero for an ideal solution. Its differential equals $TdS + Vdp$, and its partial derivative with respect to temperature is the heat capacity at constant pressure. The change in this quantity equals the (*) heat transferred in a reaction at constant pressure. The Born-Haber cycle calculates this quantity for ionic lattices using the fact that this quantity is a state function and hence path-independent, as stated by Hess's law. It is equal to internal energy plus pressure times volume. For 10 points, name this thermodynamic quantity symbolized H.

ANSWER: enthalpy

<Chen>

2. After fleeing England, Peter Payne became one of this man's posthumous devotees. A Compactata that legitimized the followers of this man was vigorously upheld by King George of Podebrady. This one-time student of Stanislav of Znojmo clashed with Archbishop Zbynek Zajic over the issue of Utraquism. He wrote the treatise *De ecclesia* while in exile, and some of his followers formed the (*) Taborite faction. This one-time leader of the Bethlehem Chapel was supported by King Wenceslaus IV and influenced by the ideas of John Wycliffe. After having his safe passage guaranteed by Emperor Sigismund, he was nonetheless burned at the stake in 1415 at the Council of Constance. For 10 points, name this Czech religious reformer.

ANSWER: Jan Hus [or Jan Huss]

<Bentley>

3. This artist saw "the ascendancy of poetry over painting" in a painting that moved him to tears, de Chirico's *The Song of Love*. This artist painted his patron Edward James staring at the back of his head in a reflection in *Not to be Reproduced*. A streetlight on a dark road is juxtaposed with a daytime sky in one of his (*) *Empire of Light* paintings. He painted dozens of identical men floating in the air in *Golconda*. In another of his paintings, a clock rests on a mantle above a train emerging from a fireplace. For 10 points, name this Belgian artist of *Time Transfixed* who included the phrase "This is not a pipe" in *The Treachery of Images*.

ANSWER: Rene Magritte

<Bentley>

4. One of these objects has a wolf hair tied to it as a secret message from Gudrun. Another one was created along with a boar and a hammer by Brokk and Eitri; Hermod received that example of these objects from Baldur in Hel after it was placed on Baldur's funeral pyre. One of these objects named for its owner (*) Andvari was taken by Loki. Odin had one of these which activated every ninth night to make eight copies of itself. A cursed Norse one was taken from the dragon Fafnir and changed hands inside a ring of fire when Brynhild got it from Sigurd. For 10 points, name these objects which include Draupnir, a type of jewelry that caused the downfall of a Nibelung.

ANSWER: rings [or arm rings; accept armbands]

<Silverman>

5. One constant named for this man is equal to one-half of an object's rotational velocity over its distance from the galactic center plus one-half of the derivative of its velocity with respect to its radial position. That constant is used to describe the rotational properties of stars in our galaxy. Part of WISE's mission was to verify John Matese's hypothesis that a gas giant named Tyche existed in an (*) entity named for this man. The existence of a brown dwarf named Nemesis lying in that object has largely been disproven. It is thought that long period comets originate from an entity named for this man that lies outside the scattered disc and Kuiper Belt. For 10 points, what astronomer lends his name to a "cloud" at the outer edge of the solar system?

ANSWER: Jan Oort

<Hothem>

6. The finale of this work was cited by the composer as his first use of metrical irregularity due to it largely being in 7/4 time. Previously, a bassoon introduces the melody of a piece in which the title character lulls the enemy soldiers to sleep, which is this work's "Berceuse". This work is more commonly performed in the form of suites arranged in (*) 1919 and 1945. The central character of this ballet destroys an egg containing the soul of Kaschei the Immortal with the help of the title creature. That central character is Prince Ivan. Followed up by *Petrushka* and *The Rite of Spring*, for 10 points, name this ballet by Igor Stravinsky about a mythical avian.

ANSWER: *The Firebird* [or *L'Oiseau de Feu*]

<Rosenberg>

7. In one poem, this man concludes "your shadow covers this page" and repeatedly asks the reader to "listen to me as one listens to the rain". In another poem, he described the "inexpressible presence of presences" resulting from "the spring of origin which will dissolve our faces". A work by this man set in the temple of Galta explores the divine nature of language partly through the eyes of (*) Hanuman. The line "willow of crystal, a poplar of water" opens a poem by this author based on the structure of the Aztec calendar. "The Day of the Dead" and "The Sons of La Malinche" are two essays in a collection by this author of *The Monkey Grammarian*. For 10 points, name this author of "Sunstone" and *The Labyrinth of Solitude*, a Mexican poet.

ANSWER: Octavio Paz Lozano

<Mehigan>

8. During a historical period with this number in its name, a major figure would wander the countryside offering his expertise in siegecraft to imperiled cities if they allowed him to tell them about universal love. Lian Qichao and Kang Youwei led a reform identified by this number under Guangxu that ended with an 1898 coup by Cixi. The speech "On the Correct Handling of Contradictions Among the People" ended a (*) "campaign" defined by this number, which briefly allowed anti-state criticism. Mao's abortive reform was named for this many flowers, equal to the number of days between Napoleon's escape from Elba and defeat at Waterloo. For 10 points, give this number of years identifying a medieval war between France and England actually lasting from 1337 to 1453.

ANSWER: 100

<Bentley>

9. Speakers of this language play a game of tone and syllable reversal called “noi lai,” which can be used to spread politically subversive messages. Henri Maspero mapped the dialect areas of this language, including the Haft Anna zone. This six-toned language is currently written under the Quoc Ngu (UK nuh-uh) system. Like several languages spoken in a neighboring country, this language is a member of the Austroasiatic or Mon-(*)Khmer family, of which it is the most widely spoken tongue. This language's vocabulary displays influence from both Chinese and French colonization. For 10 points, identify this language written in the Latin alphabet with up to two diacritics per letter, and spoken in Hue and Hanoi.

ANSWER: Vietnamese [or ti?ng Vi?t]

<Weiner>

10. This character is at one point punished by being forced to wear the head of a woman he had decapitated. One of this character's sons is known as "Le Bel Inconnu", or "The Fair Unknown". This man's power grows stronger in the morning and weaker in the afternoon. In one work, this character wears a shield emblazoned with a pentangle and goes to the Chapel Perilous after accepting a (*) magic girdle. This son of Lot and brother of Mordred loses an epic battle with Lancelot at the end of *Le Morte d'Arthur*. In a different work, he resists seduction by Sir Bercilak's wife, but is nicked by the final blow in a beheading contest with the title figure. For 10 points, name this nephew of King Arthur who has a confrontation with the Green Knight.

ANSWER: Sir Gawain [or Gwalchmei; or Gualgvanus; or Gauvain]

<Silverman>

11. This poet opened an elegy to her father David with the line "A dryness is upon the house". The title character states "I'd like to live in the country, and spread my arms all day" in this author's poem "Rudolph Is Tired of the City". Faith Ringgold illustrated a book by this author set in a neighborhood that also titled her first poetry collection, *A Street in* (*) *Bronzeville*. This poet included the sections "Notes from Childhood and Girlhood" and the mock epic "The Anniad" in one of her collections and described people who "lurk late", "strike straight" and "sing sin" in a poem about some pool players who "die soon". For 10 points, name this African-American poet of *Annie Allen* and "We Real Cool".

ANSWER: Gwendolyn Elizabeth Brooks

<Bentley>

12. One movement in this piece opens with a solo flute playing a melody beginning with the six eighth notes: "B - G-sharp - F-sharp - E - F-sharp - G-sharp". A bevy of Moroccan maidens are depicted in this work's "Arabian Dance". A triangle accompanies the strings in a mazurka in (*) "Anitra's Dance" from this work. A violin is sometimes substituted for a voice in performances of "Solveig's Song" from this work. This work also contains a piece in B minor that begins with the low register instruments depicting the title character quietly creeping before growing to a loud and frantic climax as he is chased by trolls. "Morning Mood" and "In the Hall of the Mountain King" are found in, for 10 points, what work of incidental music by Edvard Grieg?

ANSWER: Peer Gynt [or Peer Gynt Suites; but NOT "Peer Gynt Suite No. 1"]

<Berend>

13. In one of this man's analogies, a rowdy crowd, betting businessmen, and athletes all attend a sporting event where the contemplation of the crowd is the most praiseworthy. Short maxims called *acusmata* were attributed to this man. Numa Pompilius talks to this man in book 15 of the *Metamorphoses* about this man's theory of metempsychosis, or transmigration of souls. This man developed the idea that the humming noise of each (*) planet combines into harmonic "music of the spheres". His followers gathered in Croton, and refused to quash the souls of beans by eating them. For 10 points, name this pre-Socratic philosopher from Samos who associated mathematical ratios with music intervals and did math on triangles.

ANSWER: Pythagoras of Samos

<Jackson>

14. Procuste mutants have defects in the synthesis of this compound. *Sarcina* and *Acetobacter* are bacteria that synthesize this compound, which in other organisms uses a sitosterol dextrose primer for its synthesis. This compound is synthesized by the product of the *CesA* gene, which forms hexagonal rosette-shaped complexes. This compound, which is often strengthened by (*) pectins and lignins, contains beta-1,4 linkages between D-glucose molecules, forming microfibrils that then form paracrystalline arrays. Ruminants are able to digest this compound, which allows them to eat grass. For 10 points, name this most common organic compound on earth, a complex polysaccharide that makes up the cell walls of plants.

ANSWER: cellulose

<Mukherjee>

15. In one scene in this play, several drunkards in this play remove wax stoppers from bored holes, resulting in a miraculous flow of wine. At the end of this play, angels suddenly appear to drop burning rose petals, after which a "Chorus Mysticus" proclaims that "The Eternal Feminine leads us onward". This play's title character visits the Auerbach's Cellar tavern, celebrates the anniversary of Oberon and Titania on the (*) Blocksberg, and fathers a child named Euphorion with Helen of Troy. In its first section, Wagner and the title character are followed home by a poodle who transforms into a character who assists in the seduction of Gretchen. For 10 points, name this play in which Mephistopheles makes a bargain with a scholar, written by Goethe.

ANSWER: Faust [or Faust: The First Part of the Tragedy; or Faust Part One; or Faust: The Second Part of the Tragedy; or Faust Part Two; or Faust: Der Tragödie erster Teil; or Faust: Der Tragödie zweiter Teil]

<Gupta>

16. Transitions named for these objects are subject to the selection rule that L must change by one. The Synchrotron Radiation Source uses magnets in this configuration to generate synchrotron radiation. This configuration, which corresponds to the l equals one spherical harmonic, is the highest-order one unable to radiate gravitational waves. An oscillating one of these radiates power proportional to the fourth power of (*) frequency. The electric field of these entities drops off as the third power of the distance. The torque on one of these in an electric field is equal to the cross product of its namesake moment and the electric field. For 10 points, name this arrangement in which one positive and one negative charge are paired together.

ANSWER: dipole

<Mukherjee>

17. Early in this man's administration, a flood largely destroyed the city of Pueblo, Colorado. This president personally presented a capsule of radium worth one hundred thousand dollars to Marie Curie. During his administration, the Nine Power Treaty was signed, reaffirming the earlier Open Door Policy for China. He appointed hanger-on Harry Daugherty as Attorney General and was plagued by a (*) scandal involving a company owned by Harry F. Sinclair that had been given mineral rights in Wyoming by his Interior Secretary Albert Fall. Known for promising a “return to normlacy” after World War I, for 10 points, name this president who endured the Teapot Dome scandal and was succeeded by Calvin Coolidge after dying in office.

ANSWER: Warren Gamaliel Harding

<Bentley>

18. Any function from a set with the discrete topology will have this property, as the discrete topology includes all elements and thus all subsets are open. A function has this property if the preimage of all open sets in the range are also open. Any function with this property on a closed interval will also meet the criterion for the stronger (*) “uniform” type of it. On a closed interval, a function of this type will assume all intermediate values. Real functions have this property if for all x in the domain, the limit of the function as it approaches x equals the function's value at that point. For 10 points, name this property of functions that can be drawn without lifting the pencil.

ANSWER: continuity

<Bailey>

19. One ruler with this first name renovated the city of Betharamptha, renaming it Livias and then Julias. The first ruler of this name built the Antonia Fortress and was granted a monopoly on the Cyprus copper mines. That ruler with this name was a son of Antipater the Idumaeon, and executed his second wife Mariamne for adultery. A ruler with this name honored the second Roman Emperor by founding the city of (*) Tiberias, while another founded Caesarea. A “Great” ruler with this name ordered the reconstruction of the Second Temple in Jerusalem; that man's successor, Antipas, was influenced by Salome to execute John the Baptist. For 10 points, give this common name of rulers of Judea, one of whom orders the Massacre of the Innocents in the Gospel of Matthew.

ANSWER: Herod [or Hordos or Herodes]

<Bentley>

20. In oral tradition, this man joins Balaam and Jethro as one of Pharaoh's three advisers during the Book of Exodus. This man is the father of Keziah and Jemima. His narrative omits the Ziz in mentioning two of the Ziz's mythical counterparts. This man is confronted by the young man Elihu, and earlier he notes that he will (*) die naked, as he came from his mother's womb. This resident of Uz is asked if he can capture the Behemoth or use a fishhook to pull in the Leviathan. This man rejects the advice from Eliphaz, Bildad, and Zophar, who insist that he must be a sinner after his house collapses. For 10 points, name this Old Testament man who loses his possessions and family after a dispute between God and Satan.

ANSWER: Job [or Iyyov]

<Cheyne>

21. Pope Pius XI issued the encyclical “Dilectissima Nobis” about church persecution in this country. A writer from this modern day country was imprisoned for four years for translating the Song of Songs. The Jewish vizier Joseph ibn Naghrela was killed in a 1066 massacre in here during an overall peaceful period of religious tolerance known as “The Coexistence.” Important centers of scholarship in what is now this country include the Nasrid court and the University of (*) Salamanca. Along with its western neighbor, this country carried out many auto-da-fe rituals against heretics. This modern day country expelled Sephardic Jews in 1492 after the Alhambra decree was issued. For 10 points, name this site of Ferdinand II’s brutal Inquisition against non-Christians.

ANSWER: Kingdom of Spain

<Cheyne>

22. The scheduling of this event was altered by the "Normas Nonnullas" decree. It began with an oath read by Giovanni Battista Re and the order "extra omnes." Julius Darmaatmadja declined an invitation to this event for medical reasons, and Keith O'Brien's plans to attend were derailed by accusations of innappropriate (*) sexual conduct. Candidates passed over at this event included Marc Ouellet of Canada and Angelo Scola, the archbishop of Milan. For 10 points, name this event that ended with white smoke being sent up to announce the selection of Jorge Bergoglio as Francis I.

ANSWER: the 2013 Papal conclave [prompt on any answer related to "selecting a Pope" that does not include the word "conclave"]

<Weiner>

23. Lawlor developed a multivariate version of this statement that applies to functions on a smooth curve. This theorem is proven by invoking Cauchy's mean value theorem to show that one quantity involved is bounded by two functions. This theorem can be applied to the expression x to the power of x by using a logarithm. This theorem cannot be applied when ratios of certain trigonometric functions are involved due to repeated (*) oscillations, and it is able to transform indeterminate forms to determinate ones. This theorem states that $\frac{f(x)}{g(x)}$ has the same limit as $\frac{f'(x)}{g'(x)}$. For 10 points, name this theorem which is used to find the limit when a expression like zero divided by zero is involved.

ANSWER: L'Hôpital's Rule

<Mukherjee>

24. This man wrote about an emotional relationship between Felix de Vandenesse and Henriette de Mortsau in *The Lily of the Valley*. Marie de Verneuil falls in love with “Le Gars” in his novel *Les Chouans*, while Baron Hulot steals money to support Valerie Marneffe in another of his novels. One of this man's characters works for Prime Minister de Marsay and carries on an affair with (*) Delphine de Nucingen. In a novel by this author, Madame Vauquer’s boarding house is home to the criminal Vautrin and the title old man, who rages about his ungrateful daughters, one of whom hooks up with Eugene de Rastignac. For 10 points, name this French realist who included *Cousin Bette* and *Pere Goriot* in his *Human Comedy*.

ANSWER: Honore de Balzac

<Nutter>

1. This function uses a sigma term which is approximately equal to 0.9 times the distance at which energy is the lowest. For 10 points each:

[10] Name this common, simple potential modeling the energy between two neutral atoms. It includes a negative-sixth and negative-twelfth power of the radius, and was named for a British mathematician.

ANSWER: **Lennard-Jones** potential

[10] The negative-sixth power of potential arises due to these intermolecular attractive forces, which are caused by induced dipoles in a polarizable electron cloud. They are a type of van der Waals force.

ANSWER: **London** dispersion forces [or London **dispersion** forces]

[10] The Lennard-Jones potential only applies well to this group of elements, which do not form permanent dipoles. These elements are the ones which have a compressibility factor closest to one.

ANSWER: **noble gases** [or Group **18**]

<Silverman>

2. In reaction to his chief foreign rival winning an Olympics bid, this man ordered a bombing of Flight 858. For 10 points each:

[10] Identify this politician whose government developed the philosophy of “self-reliance” or *juche*.

ANSWER: **Kim Il Sung** [or **Kim Song-ju**]

[10] Kim Il Sung led this country, bordered to the south by the Demilitarized Zone.

ANSWER: **North Korea** [or **Democratic People's Republic of Korea** or **DPRK**; do not accept or prompt on just “Korea”]

[10] This American ship, captained by Lloyd M. Bucher, was captured by Kim Il Sung’s government in 1968. Its crew gave the “Hawaiian good luck sign” in propaganda photos.

ANSWER: USS **Pueblo**

<Bentley>

3. Note to Moderator: DO NOT read the alternate answer to the first part.

The triumphant, energetic march which comprises this work's third movement is followed by a startlingly somber adagio fourth movement. For 10 points each:

[10] Identify this B-minor symphony, its composer's last, whose second movement is a limping waltz in 5/4 time. The composer's death a few days after the premiere has led many to call the work a suicide note.

ANSWER: **Symphony No. 6** in B minor, Op. 74, “**Pathétique**” [accept symphony number or nickname; also accept “Tchaikovsky's Sixth Symphony” and clear equivalents]

[10] The “*Pathétique*” Symphony was written by this Russian composer of *Marche Slave* and the *1812 Overture*.

ANSWER: Pyotr Ilyich **Tchaikovsky**

[10] This work by Tchaikovsky opens with a four-note melody for French horn in the home key of B-flat minor. It was premiered in Boston with Hans von Bulow as the soloist and led to an infamously angry argument with Nikolai Rubinstein.

ANSWER: **Piano Concerto No. 1** in B-flat minor, Op. 23 [accept clear equivalents like “First Piano Concerto”]

<Rosenberg>

4. In some accounts, these beings live in a celestial mountain range called the Kaf, and according to the Qu'ran, Allah created them out of smokeless fire. For 10 points each:

[10] Name these spritual beings which, like angels and men, have free will. They include winged *ifrit*.

ANSWER: **djinn** [or **jinni**; or **genies**]

[10] According to Islam, this king ordered the djinn to build the first Temple in Jerusalem. He was the son of king David.

ANSWER: King **Solomon** [or **Jedidiah**; or **Shlomo**; or **Suleyman**]

[10] In Islam, a chief djinn with this name became the Devil when he refused to bow to Allah for creating Adam. He and his followers are sometimes called *Shaitan* by analogue with "Satan".

ANSWER: **Iblis** [or **Arazil**]

<Bentley>

5. A man crouches on a pedestal underneath another man in a version of this scene by Giambologna. For 10 points each:

[10] Identify this common artistic scene. Rubens' version portrays the title characters in 17th-century Flemish clothes despite its classical setting.

ANSWER: **Rape of the Sabine Women** [or **Rape of the Sabine Woman**; do not accept "Intervention of the Sabine Women"; prompt on just "Sabine Women"]

[10] This Neoclassical French artist depicted the later scene of the *Intervention of the Sabine Women* in a 1799 canvas. He also painted *The Death of Marat* and *Oath of the Horatii*.

ANSWER: Jacques-Louis **David**

[10] David's *Intervention of the Sabine Women* contains several infants crawling on the ground, much like this earlier French artist's *Rape of the Sabine Women*. This artist of *A Dance to the Music of Time* painted a woman possibly representing death putting her hand on the back of a shepherd looking at a tomb.

ANSWER: Nicolas **Poussin**

<Bentley>

6. This man and Michel Mongourit had plans to invade Florida and New Orleans with an American militia. For 10 points each:

[10] Name this minister of the French Republic, who was asked to step down from his post when he refused to stop arming privateers and organizing American volunteers to attack British territory.

ANSWER: Edmond-Charles **Genêt** [or Citizen **Genêt**]

[10] Genêt made arrangements with this Revolutionary general to invade New Orleans with 800 men. This "Conqueror of the Old Northwest" defeated the British at Fort Kaskaskia in one of the westernmost battles of the war, and had a better-known younger brother.

ANSWER: George Rogers **Clark**

[10] By commissioning privateers, Genêt was asking Americans to violate this proclamation issued by Washington in 1793. It was made into law in 1794, and stated the United States would not support either France or Britain in their present fighting.

ANSWER: **Neutrality** Proclamation [or Proclamation of **Neutrality**]

<Bailey>

7. The protagonist of this novel is reproached by Mozart for using a knife that magically appeared in his pocket to stab Hermine in the Magic Theater. For 10 points each:

[10] Name this novel in which the middle-aged intellectual Harry Haller is given a treatise describing his own mental struggle between the higher, human and the lower, animalistic sides of his personality.

ANSWER: *Der Steppenwolf* [or *The Steppenwolf*]

[10] *Steppenwolf* was written by this German-Swiss author of *The Glass Bead Game*. He wrote about the spiritual journey undertaken by a Brahmin's son in *Siddhartha*.

ANSWER: Hermann Hesse

[10] This Hesse novel, set in the Middle Ages, is about a teacher and a novice at the monastery of Mariabronn. The former becomes an abbot, while the latter becomes a wanderer after an inspiring affair with a Gypsy woman.

ANSWER: *Narcissus and Goldmund* [or *Death and the Lover*; or *Narziss und Goldmund*]

<Gupta>

8. Identify the following about security exploits in computer programs, for 10 points each.

[10] Python mitigates overflow in these data types by converting them to arbitrary length longs. Unlike floats, these data types do not store numerical value that comes after a decimal point.

ANSWER: integers [or ints or shorts; or integral]

[10] A common security exploit involves overflowing one of these entities. In Java, an object of this type has a capacity, limit and position and can be used in conjunction with streams in namesake Reader and Writer objects to perform File IO.

ANSWER: data buffer

[10] One way to reduce the possibility of security exploits is by using these types of tests. These white-box tests make use of mock objects or fakes in order to test the input and output of one specific function, and should not be confused with end-to-end tests.

ANSWER: unit tests

<Bentley>

9. This play was originally published in two parts under the names *Millennium Approaches* and *Perestroika*, the first of which sees Roy Cohn offer Joe Pitt a position in the Justice Department. For 10 points each:

[10] Identify this play in which Louis Ironson is horrified to learn that his lover Prior Walter has contracted AIDS.

ANSWER: *Angels in America: A Gay Fantasia on National Themes*

[10] Tony Kushner's *Angels in America* was the three thousand seventy-first, and last, work listed in the appendices to this Harold Bloom tome, which also outlines Bloom's opposition to the so-called "School of Resentment".

ANSWER: *The Western Canon: The Books and School of the Ages*

[10] Kushner also wrote the screenplay for the film *Lincoln*. Lincoln's "Prairie Years" and "War Years" were the subject of a two-volume biography by this earlier author, who wrote such popular poems as "Fog", "Grass", and "Chicago".

ANSWER: Carl Sandburg

<Bentley>

10. This man used a nervous girl on a date and a waiter attempting to imitate the idea of being a waiter as examples of “bad faith.” For 10 points each:

[10] Name this modern French philosopher who pioneered existentialism in his *Being and Nothingness* after his time as a prisoner of war.

ANSWER: Jean-Paul **Sartre**

[10] “Existentialism is a” type of this philosophy according to a 1945 Sartre lecture. Erasmus exemplified the Renaissance type of this philosophy, which encouraged the cultivation of good men through classical learning.

ANSWER: **humanism** [or **humanist** philosophy]

[10] People who overcome bad faith are in this state of pride in one’s own choices. Heidegger also praised people who reach this state by embracing Being-towards-Death.

ANSWER: **authenticity** [or **authenticité**; or **authentisch**; or **Authentizität**]

<Jackson>

11. A simple qualitative picture of them is that a free electron exerts attractive forces on positive ions, which in turn exerts an attractive force on another free electron, bounding the two. For 10 points each:

[10] That aforementioned description is a simplified model of what interacting groups of two electrons, whose contribution to a system only becomes sufficiently large when thermal motion is low?

ANSWER: **Cooper pairs**

[10] Cooper pairs are predicted by BCS theory, which describes this phenomenon, in which a substance has developed a near-zero value for resistance.

ANSWER: **superconductivity** [accept word forms]

[10] Superconductivity is exploited to create these very precise magnetometers, in which the magnetic flux is measured at a Josephson junction.

ANSWER: **SQUIDS** [accept **superconducting quantum interference device**]

<Jose>

12. This church is the largest in the world, which it snarkily proves with floor markers showing where other churches would fit if placed inside. For 10 points each:

[10] Name this basilica in Vatican City which was partly designed by Michelangelo and Carlo Maderno.

ANSWER: **St. Peter's** Basilica [or Papal **Basilica of Saint Peter** in the Vatican; or Basilica Papale di **San Pietro** in Vaticano]

[10] Much of the interior of St. Peter's, including the baldachin over its altar and the Cathedra Petri in the apse, was designed by this sculptor.

ANSWER: Gian Lorenzo **Bernini**

[10] This architect, who marked the location of St. Peter's martyrdom with his small and well-proportioned Tempietto, was selected as the main architect of St. Peter's Basilica by Julius II.

ANSWER: Donato **Bramante**

<Mehigan>

13. This man allied with Sulla early in his career and later reconciled with a co-consul at Luca. For 10 points each:

[10] Identify this notoriously wealthy Roman who suppressed the slave revolt led by Spartacus.

ANSWER: Marcus Licinius **Crassus**

[10] Crassus was a member of this group along with Pompey and Julius Caesar.

ANSWER: **First Triumvirate**

[10] This man helped save the remains of the Roman army after Crassus' fatal defeat at the Battle of Carrhae. He went on to defeat Publius Cornelius Dolabella in Syria, but this "Last of the Romans" met his end at Philippi.

ANSWER: Gaius **Cassius** Longinus

<Bentley>

14. Like Dido, this man was originally a noble in the Phoenician city of Tyre; he set out to find his abducted sister Europa. For 10 points each:

[10] Name this man who introduced the alphabet to Greece. He founded a city on a spot where he planted dragon's teeth in the ground.

ANSWER: **Cadmus** [or **Kadmos**]

[10] Cadmus founded this city. A group of "Seven Against" this city attacked it after its king Oedipus exiled himself.

ANSWER: **Thebes** [or **Thebai**]

[10] Two children of Antiope constructed the walls of Thebes with their burly arms and an enchanted lyre while ruling it in a joint kingship. Name either.

ANSWER: **Amphion** OR **Zethus** [accept **Amphion and Zethus**; or **Zethus and Amphion**]

<Silverman>

15. Answer the following about south Texas, for 10 points each:

[10] El Paso lies on this river, which forms the boundary between the United States and Mexico before it flows into the Gulf of Mexico.

ANSWER: Río **Grande** [or Río **Bravo** del Norte]

[10] The largest inland port on the Río Grande is this city, which in 1840 was briefly the capital of the Republic of the Rio Grande. This city is the third most populous on the US-Mexican border after San Diego and El Paso.

ANSWER: **Laredo**

[10] The southernmost major city in Texas is this city whose population is 93% Latino. It lies on the Rio Grande across from the Mexican city of Matamoros.

ANSWER: **Brownsville**

<Wasserman>

16. In *Doing Nothing*, Tom Lutz contrasted this man with Benjamin Franklin, calling him the man who "almost singlehandedly invent[ed] the slacker" with his *Idler* essays. For 10 points each:

[10] Identify this English author who published the periodical *The Rambler*.

ANSWER: Dr. Samuel **Johnson**

[10] Samuel Johnson was the subject of a massive, hugely important biography by this Scottish author of *Journal of a Tour to the Hebrides*.

ANSWER: James **Boswell**

[10] Johnson included this author of the play *Tyrannick Love* in his *Lives of the Most Eminent English Poets*. This Restoration dramatist's other works include the poem *Annus Mirabilis* and the play *Marriage a la Mode*.

ANSWER: John **Dryden**

<Bentley>

17. Identify the following about some dormant amendments to the US Constitution, for 10 points each:
[10] The twenty-seventh amendment, which limited Congress' ability to perform *this* action, was finally ratified in 1992 after being part of the original 12 amendments in the Bill of Rights.

ANSWER: Vote themselves a **pay increase** [accept equivalents that indicate **increasing Congressional salaries**]

[10] The Corwin Amendment, which has been ratified by Illinois, Maryland and Ohio, would have forbidden Congress from passing this later amendment. This amendment formally abolished slavery.

ANSWER: **Thirteenth** Amendment

[10] In 1810, Philip Reed, a senator from this state, proposed an amendment that would have stripped citizenship from US citizens who received foreign ranks of nobility. This state sent delegates like Daniel Carroll and Luther Martin to the Constitutional Convention.

ANSWER: **Maryland**

<Bentley>

18. This author narrated a trip from Paris to Marseilles with his wife Carol Dunlop in *Autonauts of the Cosmoroute* and described a man reading a book whose characters come to kill him in "Continuity of Parks". For 10 points each:

[10] Identify this author of the experimental *62: A Model Kit* and the more political *A Manual for Manuel*.

ANSWER: Julio **Cortazar** [or Jules Florencio **Cortázar**]

[10] Cortazar's most famous works are the short story "Blow-Up" and this novel about Horacio Oliveira's love for La Maga. Of its 155 chapters, 99 are termed "expendable".

ANSWER: **Hopscotch** [or **Rayuela**]

[10] Cortazar's minor works include a novella about a conflict between the comic villain Fantomas and some "multinational" beings of this type. Another of these beings imprisons Mina Murray and is pursued by Van Helsing in a Bram Stoker novel.

ANSWER: **vampires** [or **vampiros**]

<Mehigan>

19. This process is partially mediated by the Bcl-2 family of genes, which in *Drosophila* include *Buffy* and *death executioner Bcl-2 homolog*. For 10 points each:

[10] Name this process, which can be assayed for using trypan blue exclusion or the TUNEL assay. This type of ordered programmed cell death differs from unplanned necrosis.

ANSWER: **apoptosis**

[10] These proteases catalyze many of the cell disassembly reactions during their namesake "cascade." Many of them contain CARD domains.

ANSWER: **caspases** [or **cysteine-aspartic acid-specific protease**]

[10] One assay for apoptotic cells involves staining with 7-AAD and subjecting the cells to this technique, in which a stream of cells is passed through a laser and their scattering properties are measured.

ANSWER: **flow cytometry** [accept **FACS** or **fluorescent-activated cell sorting**]

<Wynne>

20. This book is published by the American Psychiatric Association and organizes conditions along five axes. For 10 points each:

[10] Name this recently revised book used by medical professionals to classify and identify mental diseases.

ANSWER: **DSM-5** [or **Diagnostic and Statistical Manual** of Mental Disorders]

[10] The DSM-5 controversially eliminated Asperger's syndrome and persistent developmental disorder and instead combined them into one "spectrum disorder" named for this condition. This childhood disorder causes delayed or impaired communication and social interaction.

ANSWER: **autism**

[10] The DSM-5 now includes Temper Dysregulation Disruptive Disorder, one alternative to diagnosing this disorder in children. Variants of this mental disease, including cyclothemia, are often treated with antipsychotics like Lamictal or Seroquel.

ANSWER: **bipolar** disorder [or **bipolar** affective disorder; or **manic depression**; or **manic depressive** disorder]

<Spencer>

21. This author wrote about tycoon Eric Parker's limo trip across New York City to get a haircut, during which he loses huge sums of money betting against the yuan, in his novella *Cosmopolis*. For 10 points each:

[10] Identify this American postmodernist, the author of *Libra* and *Mao II*. A large cast of characters, including J. Edgar Hoover and waste management executive Nick Shay, populates his novel *Underworld*.

ANSWER: Don **DeLillo**

[10] New Yorker Pammy Wynant works at a grief management firm in this complex in DeLillo's novel, *Players*. Keith Neudecker survives a 2001 terrorist attack on this building in *Falling Man*.

ANSWER: the **World Trade Center** buildings/complex/etc. [prompt on "North Tower"]

[10] In a scene from DeLillo's *White Noise*, Murray Siskind takes Jack Gladney to see a popular tourist attraction consisting of a much-photographed one of these buildings. Siskind claims that "once you've seen the signs about" it, it "becomes impossible to see" it, and that the tourists thronging it are "taking pictures of taking pictures".

ANSWER: a **barn** [or the Most Photographed **Barn** in America]

<Bentley>

22. This structure is composed of the amnion, allantois, and chorion. For 10 points each:

[10] Name this structure across which nutrients, gases, and other molecules pass between mother and fetus.

ANSWER: **placenta**

[10] The blood found in this structure's two arteries and one vein is often banked due to its richness in stem cells. This structure connects the fetus to the placenta.

ANSWER: **umbilical cord** [prompt on **cord**]

[10] Mesenchymal stem cells in the umbilical cord can be found in this mucous connective tissue that surrounds the umbilical blood vessels.

ANSWER: **Wharton's jelly**

<Wynne>

23. This agreement decreed that the religion of the ruling prince should determine the religion of that division of the empire, and was signed seven years after an interim peace negotiated at the same location. For 10 points each:

[10] Identify this 1555 agreement that provided an early settlement between Catholics and Lutherans in the Holy Roman Empire.

ANSWER: Peace of **Augsburg**

[10] The Peace of Augsburg shouldn't be confused with the Augsburg Confession, which was written by this man. He also summarized Luther's theology in the *Loci communes*.

ANSWER: Philipp **Melanchthon** [or Philipp **Schwartzerd**]

[10] An early test for the Peace of Augsburg was the destructive Seneschal's War, which was led by Gebhard Truchsess von Waldburg and often named for this city. This city's massive cathedral spent four years as the tallest building in the world.

ANSWER: **Cologne** or **Köln**

<Bentley>