

## Bulldog High School Academic Tournament 2017 (XXVI): Revenge of the BH-SAT

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### Packet 12 Tossups

1. For a body undergoing circular motion due to gravity, total energy equals potential energy times *this* factor. In special relativity, length contraction is proportional “one minus beta-squared” all *raised to this* power. The reduced mass of a pair of identical bodies equals *this* number times the mass of one body. For a solid disk in the  $x$ - $y$  plane, the moments of inertia about the  $x$  and  $y$  axes both equal (\*) this constant times the moment of inertia about the  $z$  axis. This fraction appears in the potential energy formula for a harmonic oscillator, and it multiplies “ $a$   $t$ -squared” in the acceleration term for projectile motion. Kinetic energy equals—for 10 points—what fraction, times mass times velocity-squared?

ANSWER: one half [or one over two; or 0.5] <AF>

2. *Warning: description acceptable.* One of these places in Sri Lanka includes a room framed by long elephant tusks and is located in Kandy. Most of these places in Japan follow the *Shichido Garan*, a floorplan that mimics the structure of the human body, placing the *butsuden* at the heart and the *hojo* outside of the body. One of these places called Ryoanji, has a (\*) garden consisting entirely of 15 rocks. These places often have *stupas* in the form of pagodas. A Hindu temple was turned into one of these places in Cambodia. Borobudur and the Angkor Wat are—for 10 points—what kind of religious structure, where you might meditate or contemplate relics of Siddhartha Gautama?

ANSWER: Buddhist temples [accept reasonable equivalents] <IKD>

3. This place is often described by the adjective *chthamale* or “low-lying.” A story about a king of this place is compared to the Abraham and Isaac story in the first chapter of Erich Auerbach’s book *Mimesis*. A bed in this place can’t be moved since it’s made of a living olive tree. A dog dies of excitement after seeing a king of this place, whose (\*) identity is given away by a scar. A queen of this place daily unweaves a burial shroud to stave off a pack of suitors. It was ruled by a son of Laertes who returns to it in a namesake Homeric epic. For 10 points, name this island home of Penelope and Odysseus.

ANSWER: Ithaca [or Ithake; if they answer with things like Odysseus’s house, prompt by asking “What kingdom is that in?”] <JW/JR>

4. These are the most common elements used to form carbon-carbon bonds in coupling reactions. Several of these elements take an electron or two from a higher-energy  $s$  orbital to get a round 5 or 10 electrons in another orbital. Orbitals of these elements split according to crystal field theory. These elements include the lightest elements that violate the (\*) Aufbau principle. Ligands bind to these elements in colorful coordination complexes. They include the only elements with partially filled  $d$ -shells. For 10 points, name these metals in the central block of the periodic table, which include copper and nickel.

ANSWER: transition metals [or transition elements; prompt on metals] <AF>

5. A London power station, including the crane in its Turbine Hall, was remodelled into one of these buildings by Herzog & De Meuron. One of these buildings in New York recently changed hands and was partially renamed for its architect, Marcel Breuer [“BROY-ur”]. A complex of this kind in Washington D.C. consists of John Russell Pope’s (\*) West Building and a modernist East Building. One of these buildings in New York consists of a skylight and a long, all-white spiral ramp, and was designed by Frank Lloyd Wright. I.M. Pei designed a glass pyramid for one of these complexes in Paris. For 10 points, name these buildings that include the Guggenheim and the Louvre.

ANSWER: museums [accept more specific answers like art museums] <JR>

6. This dynasty established the standard form of the Three Departments and Six Ministries system, and it promulgated the equal-field system of farming. Its first emperor built the new capital Daxing [“dah-shing”] on the site of Chang’an, and its second emperor rebuilt Luoyang. This dynasty’s government inspired the Taika Reforms. This dynasty collapsed following a failed war with Goguryeo. This dynasty began the construction of the (\*) Grand Canal. It took power under Wen Di in 581, unifying China for the first time in nearly 400 years, after the fall of the Han dynasty. For 10 points, name this three-emperor dynasty that was succeeded by the Tang.

ANSWER: Sui [“sway”] dynasty [or Sui chao] <JR>

7. In a play by this author, a town is shocked when a woman dances in a white dress on top of a cave during a ceremony for the dead. In that play by this author, only an “Idiot Boy” will talk to the main character, who refuses to repent to Zeus. In another play by this man, a woman offers to act as a mirror, and that woman is angered by a man’s twitching mouth. In that play by this man, characters are escorted to the main setting by a (\*) Valet, and a character reveals that she killed her baby by dropping it off a balcony. That play by this man stars Joseph, Estelle, and Inès, and contains the quote “Hell is other people.” For 10 points, name this French author of *The Flies* and *No Exit*.

ANSWER: Jean-Paul (Charles Aymard) Sartre <LL>

8. A book about this general field of philosophy presents three “figures” based on the ordering of the components of “major” and “minor” elements. Some statements in this field are represented by mnemonics like “Barbara.” A series of six works on this subject begins with a text about substance, quantity, relation, and the other seven *Categories*. This field is the subject of the *Prior* (\*) *Analytics* and other works in Aristotle’s *Organon*. This field uses rules like *modus ponens* and the law of the excluded middle, and often proceeds via syllogistic deduction. For 10 points, name this field of philosophy that evaluates the validity of arguments like “If A, then B.”

ANSWER: logic [accept deduction until that word is read; accept more specific answers like propositional logic] <JR>

9. *Warning: description acceptable.* The most famous description of this event was made at the naval base of Misenum. This event destroyed a graffiti-laden brothel called the Lupanar, as well as the Villa of the Papyri and much of the Alexander Mosaic. This event occurred a few months into the reign of (\*) Titus. The author of the encyclopedic *Natural History* died trying to rescue a friend during this event. The aftermath of this event was excavated near Naples starting in 1748. This 79 AD event was described in letters of Pliny the Younger, whose father was killed in it. For 10 points, name volcanic eruption that buried Herculaneum and Pompeii.

ANSWER: the eruption of Mount Vesuvius [prompt on partial answer; accept descriptions that involve Mount Vesuvius doing the volcano; prompt on any answer involving Pompeii or Herculaneum, until mentioned] <JR>

10. One of piece in this genre begins with low, slow repeated “C”s, followed by the sustained notes A-flat, E-flat, and A-natural. A Mozart piece in this genre was the direct model for Beethoven’s Opus 18 No. 5, which is also in this genre. Mozart’s late works in this genre are nicknamed for the publisher Hoffmeister and the King of Prussia. Beethoven’s pieces in this genre have nicknames like (\*) “Harp” and “Serioso.” Mozart included pieces in this genre nicknamed “Hunt” and “Dissonance” in a set of six dedicated to Haydn. Beethoven dedicated three of them to count Razumovsky. For 10 points, name this chamber music genre played by two violins, a viola, and a cello.

ANSWER: string quartets <JR>

11. These compounds always include three fused six-carbon rings fused to a five-carbon ring. Ibuprofen and aspirin are part of a group of anti-inflammatory drugs that are *not* these compounds. ACTH stimulates the release of both epinephrine and one of these compounds in response to (\*) stress. These lipid-soluble compounds include the androgens, and are contrasted with amino acid-derived peptide hormones. These compounds, which are named for their precursor, cholesterol, include all the sex hormones, as well as “cortico-” and “anabolic” types. For 10 points, name these hormones often used to build muscle.

ANSWER: steroid hormones [prompt on hormones; accept corticosteroids or anabolic steroids; prompt on glucoccorticoids or mineralcorticoids] <BY/JR>

12. Near its beginning, this book describes “small fowls” that “make melody” and sleep with one eye open. This book’s characters “wend” to seek a person that helped them “when that they were sick.” In one part of this book, watching a woman pick flowers causes two men imprisoned in a tower to fall in love with her. This book includes the most famous version of the legend of the (\*) fox and the rooster Chanticleer. This book begins when the “drought of March” has been “pierced to the root” by the “sweet showers” of April. A pilgrimage to the shrine of Thomas à Becket is made by the Nun’s Priest and the Knight in—for 10 points—what poetic collection of stories by Geoffrey Chaucer?

ANSWER: *The* Canterbury Tales <JR>

13. In Brazil, these places have seen a 2017 wave of violence, resulting in the deaths of many members of the PCC and the Red Command. Operation Community Shield has led to a surge of violence and overcrowding in these places in El Salvador and Honduras. In 2015, journalists were given a public tour of one of these places in Altiplano, and were shown the entrance to a (\*) tunnel that once contained a mini-motorcycle on rails. A former resident of that one of these places was extradited to the U.S. in 2017, following a *Rolling Stone* interview with Sean Penn. For 10 points, name these places, where MS-13 members and El Chapo have both recently done time.

ANSWER: prisons [or jails; accept reasonable equivalents] <IKD>

14. An incident at this location was followed by the Drexel Mission Fight. In 1973, a group led by Dennis Banks and Russell Means was besieged by FBI Agents and U. S. Marshals at its location. An incident at this location was sparked after a deaf man didn’t hear a soldier’s orders to give up his rifle, and was exacerbated by some supposedly bulletproof shirts. Dee Brown wrote a 1970 book titled (\*) *Bury My Heart at [this location]*. Black Coyote was killed at this location, along with many practitioners of the Ghost Dance at Pine Ridge Reservation. For 10 points, name this South Dakota location of an 1890 massacre of over 150 Lakota Sioux.

ANSWER: Wounded Knee Creek [accept Wounded Knee Massacre or Wounded Knee Incident] <LL>

15. The majority of this man's books were written in anapestic tetrameter. A character created by this author pays 15 cents, a nail, and a snail shell to hear a story about the title character. Another of his characters becomes known as "King of the Mud" (\*) after being offended by the moon. Another book by this man describes creatures that have "a little star" and "a little car." This man used fewer than 250 words in a book that begins "The sun did not shine." This man's characters include an environmentalist who protests against "thneeds," as well as "Thing 1" and "Thing 2." For 10 points, name this author of *The Lorax* and *The Cat in the Hat*.

ANSWER: Dr. Seuss [or Theodore Seuss Geisel] <BY/JR>

16. Near the end of this play, three male characters unconsciously raise their glasses at the same time. Characters in this play covers up their family members' drinking by adding water to a decanter of whiskey. The patriarch of a family in this play is an actor famous for only one role, whose wife showed promise as a pianist and once lived in a Catholic convent. That character from this play believes her son purposefully infected (\*) Eugene with measles. In this play, Edmund is diagnosed with tuberculosis, and his mother Mary is addicted to morphine. For 10 points, name this play about the Tyrone family, a late work by Eugene O'Neill.

ANSWER: Long Day's Journey Into Night <LL>

17. A Semitic goddess of this domain overthrew Mot's disastrous rule of the world, and a kami of it is called "the god of the eight banners." This was the domain of Hachiman and Ba'al's sister Anat. Another god of this domain was also sometimes worshipped as be a sun god who is constantly attacked by the stars, and emerged fully grown when his siblings attacked his mother (\*) Coatlicue after she was impregnated by a ball of feathers. That god of this domain requires constant human sacrifice to nourish him and is named Huitztziolopochtli. Another god of this domain had an affair with his sister Aphrodite. For 10 points, name this domain, which in Greek myth is governed by Ares.

ANSWER: war [also accept answers like battle or violence; also accept answers like sex or fertility until "kami"] <JG>

18. This is the smaller of two quantities affected by Bessel's correction. The square of this quantity gives a variable's second central moment. A value outside of  $k$ -times-this-quantity happens with probability one-over- $k$ -squared, in Chebyshev's inequality. This value is in the denominator of  $t$  and  $z$ -scores. Using 2-times-this-value as a rule of thumb gave rise to the (\*) threshold " $p$  equals 0.05." Multiples of this value produce bands that include 68, 95, and 99.7 percent of a normal dataset. The *square* of this value is given by the expected value of the square of a random variable minus its mean. The square root of the variance gives—for 10 points—what measure of how spread out a dataset is?

ANSWER: standard deviation [or SD; accept sigma] <JR>

19. This man painted a girl in blue and white looking at a billow of steam through an iron fence, while her mother, dressed in black, stares at us. In another of his paintings, green shutters frame two women in white dresses, who stare out above a green iron railing. The title pale woman of one of his paintings wears a black choker and an orchid. This painter of *The Railway* and *The* (\*) *Balcony* featured Victorine Meurent ["mur-ON"] in a painting whose background includes an "incorrectly large" woman bathing near a rowboat. He scandalized 1863 Paris with a painting of two clothed men having a picnic with a nude woman. For 10 points, name this painter of *Luncheon on the Grass* and *Olympia*.

ANSWER: Édouard Manet [do not accept pronunciations that sound more like "moh-nay," but otherwise be generous about pronunciations; prompt on "muh-nay" if you're unsure] <JR>

20. This city was aided in an operation created by Lucius Clay. Operation Clausewitz was an attempt to defend this city, which is where Yevgeny Khaldei took a photo of two soldiers raising a Soviet flag over a government building. A 1961 tank standoff occurred when one of this city's four zones was blocked off. After Soviet troops blockaded the supply routes in this city, a 1948 (\*) airlift was organized to deliver necessities to it. That structure was built by Walter Ulbricht and included Checkpoint Charlie. Ronald Reagan gave a speech telling "Mr. Gorbachev" to "tear down" a structure in this city. For 10 points, name this German city that was once bisected by a namesake Wall.

ANSWER: **Berlin** [accept **East Berlin** or **West Berlin**; accept **Berlin**] <LL>

*Tiebreaker*

21. Complexes between elements from this group and halides form excimers, which can be used to make a special type of laser. An element in this group is used in a dating method with potassium-40. These elements' high effective nuclear charges give them the smallest atomic radii. These elements appear in (\*) brackets in electron configurations. The synthesis of a hexa-fluoro-platinate confirmed that these elements can form compounds. Elements in this group have the highest ionization energy in each period, since elements in this group have eight valence electrons, making their electron shells full. For 10 points, name this group of inert elements like helium and neon.

ANSWER: **noble gases** [or group **18**; or group **VIIIA**] <AF>

## Bonuses

1. For 10 points each—answer the following about English culture under Henry VIII:

[10] Henry VIII brought Renaissance music to England by importing a group of viol players of *this* religion. The word “ghetto” comes from the name of the area where members of this religion were forced to live in Venice.

ANSWER: **Judaism** [or **Jews**]

[10] Henry VIII was a huge fan of this activity, which was a centerpiece of the meeting at the Field of the Cloth of Gold. Henry II of France died participating in this activity.

ANSWER: **jousting**

[10] It wasn’t all Jews and jousts under Henry—he also intensified the use of *this* secret court for prosecuting powerful people. This court, named for the room in which it was held, was formally established by Henry VII.

ANSWER: **Star Chamber** <JR>

2. This artist’s painting *Destruction* features a massive statue of a warrior leaning forward with his shield flung out to the left. For 10 points each:

[10] Name this artist who depicted a lone column in his painting *Desolation*. An angel guides a boat full of flowers in his painting *Childhood*.

ANSWER: Thomas **Cole**

[10] Thomas Cole was already pretty unfashionable by the time he died, since all the hip landscape painters were adopting *this* practice of painting outdoors. We need the specific French phrase, which is either two or three words.

ANSWER: **plein-air** painting [or painting **en plein air**]

[10] Plein-air painting was a core practice of this French art movement, which focused on the effect of light, depicted using small, visible brushstrokes. This movement was exemplified by Monet and Renoir.

ANSWER: **Impressionism** <JR>

3. In some climates, this process happens in the “active layer,” causing a downward slide of soil called solifluction. For 10 points each:

[10] Name this process that, by definition, never happens to permafrost.

ANSWER: **melting** [or **thawing**]

[10] Melting of permafrost itself can create so-called “drunken trees” in *this* biome, which occurs in subarctic climate zones.

ANSWER: **taiga**

[10] When thawed-out soil refreezes with a water source, this often-destructive phenomenon occurs. In this phenomenon, the accumulation of ice raises the soil, which can damage structures like roads.

ANSWER: **frost heaving** [or **frost heaves**] <JR>

4. Alcyone killed herself in this manner after learning that her hubristic husband died at sea. For 10 points each:

[10] Name this rather frequent manner of death in Greek mythology, which befell Icarus after the wax in his wings melted, and which befell Aegaeus after Theseus forgot to take down his black sails.

ANSWER: **drowning** [also accept answers like **falling into the sea** or **jumping into the sea**, prompt on any answer that involves **jumping** or **falling** but does not specify doing so into a body of water]

[10] The Hellespont got its name after Helle fell off of this flying mammal and drowned there. This animal carried Helle’s brother safely to Colchis, where King Aetetes sacrificed it.

ANSWER: The **Golden Fleece** [or the **crysomallon deras**; accept answers like “a **golden**, winged **ram**” or “the **sheep with the Golden Fleece**,” since the fleece is technically just its hide; prompt on partial answers]

[10] This man from Abydos swam across the Hellespont every night to meet with a priestess of Aphrodite, but drowned one night when a storm blew out the lamp that his lover lit to guide him.

ANSWER: **Leander** [or **Leandros**] <CX>

5. This poem titles a collection that includes a revised version of “Beyond the Alps.” For 10 points each:

[10] Name this 1964 poem that describes a monument that “sticks like a fishbone in the city’s throat.” It describes a Boston statue of Robert Gould Shaw “riding on his bubble” as “he waits for the blessed break.”

ANSWER: “**For the Union Dead**”

[10] “For the Union Dead” was written by Confessional poet Robert Lowell. Probably the best-known Confessional poet is this woman, who wrote “Lady Lazarus” and described “A man in black with a Meinkampf look” in “Daddy.”

ANSWER: Sylvia **Plath**

[10] Another huge influence on Lowell was an earlier Imagist poet whose most famous poem recounts taking *these* items. That short poem describes these items as “delicious, so sweet and so cold.”

ANSWER: the **plums** that were in the icebox, and which you were probably saving for breakfast <JR>

6. For 10 points each—answer some questions about everybody’s favorite seven-foot opera connoisseur:

[10] This Spanish NBA center, who plays for the Spurs and whose favorite opera is *Tosca*, was the 2002 Rookie of the Year. He helped Kobe Bryant to titles in 2009 and 2010, and his brother Marc plays for the Memphis Grizzlies.

ANSWER: Pau **Gasol** (Saéz)

[10] Until he was traded to the Spurs in 2016, Pau Gasol played for this city’s Bulls, who were led to six titles in the 1990s by Michael Jordan.

ANSWER: **Chicago**

[10] Chicago’s most important player is definitely not Dwyane Wade, but rather *this* 25-year-old all-star shooting guard and winner of the 2015 Most Improved Player award, who was drafted 30th overall in 2011 from Marquette.

ANSWER: Jimmy **Butler** III <LL>

7. For 10 points each—answer the following about American presidents who died on July 4th, 1826:

[10] This man was the second president to die on that date, and also the second president of the U.S. His presidency saw the XYZ affair and the Quasi-War with France.

ANSWER: John **Adams**

[10] Another casualty of that day was Thomas Jefferson, whose criticism of Adams led to these laws. These laws criminalized making false statements about the government and allowed the president to deport non-citizens.

ANSWER: **Alien and Sedition** Acts [prompt on partial answer]

[10] In response to the Alien and Sedition Acts, Jefferson secretly wrote this pro states-rights document. Along with a similar document by James Madison, this document outlined the “Principles of ‘98.”

ANSWER: **Kentucky Resolutions** [or **Kentucky Resolves**; prompt on **Virginia and Kentucky** Resolutions or Resolves] <LL>

8. For 10 points each—answer the following about rivers in West Africa:

[10] Until its 1984 renaming under Thomas Sankara, this country was named after the Volta River, which it shares with its southern neighbor Ghana. This small-ish landlocked country is home to the Mossi people.

ANSWER: **Burkina Faso**

[10] Like the Volta, this other river drains into the Gulf of Guinea. This river bends back on itself to form an inland delta, and it flows past the capital of Niamey in one of its two namesake countries.

ANSWER: **Niger** River

[10] Although there are some pretty sweet gold deposits by the Niger River, the main export of Niger is *this* metal.

ANSWER: **uranium** [accept more specific answers, including **yellowcake** uranium] <MK>

9. One of these people is assumed to be at the pub, but actually turns out to be dead, in the story “Odour of Chrysanthemums.” For 10 points each:

[10] Name this profession of Gertrude Coppard’s husband, who is Paul Morel’s father, in a 1913 novel.

ANSWER: **coal miners** [prompt on partial answer]

[10] “Odour of Chrysanthemums” and Paul Morel were created by this English author. In his most famous novel, Sir Clifford is paralyzed by an injury from the Great War.

ANSWER: D.H. **Lawrence** [David Herbert Lawrence] (Paul Morel is from *Sons and Lovers*.)

[10] The publisher of that novel, *Lady Chatterley’s Lover* was put on trial for this crime. Other books that led to trials for this crime included James Joyce’s *Ulysses* and Henry Miller’s *Tropic of Cancer*.

ANSWER: **obscenity** [accept rough equivalents like **indecentcy** or **explicitness**] <JR>

10. For 10 points each—answer the following about revolutionary lab techniques in biology:

[10] Molecular biology got a whole lot easier in 1983 after *this* technique was invented. This technique uses synthetic primers to match bits of DNA.

ANSWER: **PCR** [or **polymerase chain reaction**]

[10] Everyone in current biology is *really* excited about *this* system, which uses the Cas9 protein from a bacterial immune system. This system has been used to edit out the genes that make mushrooms turn brown when cut.

ANSWER: **CRISPR/Cas9** [or **Clustered regularly interspaced short palindromic repeat**]

[10] CRISPRs are often used by bacteria to defend against bacteriophages, which are *this* kind of agents. These agents cause diseases like flu and AIDS.

ANSWER: **viruses** <JR>

11. This piece opens with divided violas playing repeated notes, before the “short-short-long, short-short-long” main theme enters. For 10 points each:

[10] Name this G-minor symphony, one of three its composer wrote in the summer of 1788.

ANSWER: Mozart’s Symphony No. **40**, K. **550** [accept either underlined part; accept “Mozart’s **Great G minor** Symphony”; accept clear equivalents like “Mozart’s **40th**”; accept answers with “KV” or “Köchel” instead of “K.”]

[10] Mozart revised the symphony to include *these* instruments, which featured prominently in his *La clemenza di Tito*. Mozart’s last orchestral work was an A-major concerto for this instrument, written for Anton Stadler.

ANSWER: **clarinets**

[10] Mozart followed the “Great G minor” symphony with the “Jupiter” symphony, which is in this major key. This major key has no flats or sharps in its key signature.

ANSWER: **C** major <JR>

12. The earliest extant documents in this language are in a writing system called Linear B. For 10 points each:

[10] Name this language that was used to write early histories by Herodotus and Thucydides.

ANSWER: (Ancient) **Greek** [or **Hellenike**]

[10] Unlike Linear B, Linear A was *not* used to write Greek. Instead, it was the writing system of *this* Bronze age island civilization, which was based at Knossos and eventually replaced by the Mycenaeans.

ANSWER: **Minoan** civilization [prompt on any answer mentioning **Crete**]

[10] Minoan civilization collapsed around 1400 BC, but no one’s quite sure why. A popular, but probably wrong, theory holds that they never recovered from the eruption of a volcano on *this* island.

ANSWER: **Santorini** [or **Thera**] <JR>



13. Ten “modes” of this kind of philosophy were put forth by a philosopher who wrote books *Against the Mathematicians*. For 10 points each:

[10] Name this philosophical position defended in *An Apology for Raymond Sebond* and other works by Michel de Montaigne.

ANSWER: **skepticism** [accept **Pyrrhonian** skepticism]

[10] This 18th-century skeptical philosopher divided the necessary and the contingent, or “relations of ideas” and “matters of fact” in what has been dubbed his “fork.”

ANSWER: David **Hume**

[10] René Descartes also started from a skeptical position, but ended up believing that his doubting proved his existence. He summarized that argument as: “I do” *this* action, “therefore I am.”

ANSWER: I **think** [or **cogito**; or je **pense**] <JR>

14. Marianne von Willemer actually wrote a few of the poems in this man’s *West-East Divan*. For 10 points each:

[10] Name this poet, who wrote “soon, you too shall rest” in his poem “Wanderer’s Nightsong II.” His nonfiction includes the *Italian Journey* and *Theory of Colours*.

ANSWER: Johann Wolfgang von **Goethe** (“GUR-tuh”)

[10] Goethe asked the stones to “speak” in a set of this kind of poem named for Rome. Rainer Maria Rilke asked “Who, if I cried out, would hear me among the angelic orders?” in one of these poems.

ANSWER: **elegies**

[10] Goethe’s *Wilhelm Meister’s Apprenticeship* pioneered the *bildungsroman*, which is a genre of this kind of book. This is a general term for long narrative prose fiction like *Tess of the D’Urbervilles* or *Sense and Sensibility*.

ANSWER: **novels** [accept more specific answers like **coming-of-age novels**] <JR>

15. This river was home to a Bronze Age civilization centered at Harappa. For 10 points each:

[10] Name this river in modern Pakistan, which gives its name to Pakistan’s southeastern neighbor.

ANSWER: **Indus** river

[10] This other city of the Indus Valley Civilization seems to have arisen around the same time as Harappa. A “Great Bath” has been excavated from this city, whose name means something like “mound of the dead.”

ANSWER: **Mohenjo-daro**

[10] As usual with Bronze Age sites, a huge number of *these* artifacts have been dug up from Harappa and Mohenjo-daro. These cylindrical objects were often carved from soapstone.

ANSWER: impression **seals** [prompt on **stamps**] <JR>

16. A famous series of artworks in this medium depict the Hunt of the Unicorn. For 10 points each:

[10] Name these woven artworks that decorated medieval castles.

ANSWER: **tapestries**

[10] The Hunt of the Unicorn tapestries are owned by *this* museum’s medieval collection, The Cloisters. Its medieval collection includes the *Mérode Altarpiece* and the *Belles Heures du Duc de Berry*.

ANSWER: **Metropolitan Museum of Art**, New York City

[10] The *Belles Heures*, like the Limbourg Brothers’ *Très Riches Heures*, are *this* kind of art object. Another of these objects was produced around AD 800 at the Abbey of Kells.

ANSWER: illuminated **manuscripts** [accept **books** or **codices**] <JR>

17. Mathematical creation of these constructs commonly uses a method abbreviated LCAO. For 10 points each:

[10] Name these descriptions of an electron's wavefunction in a multi-atom system. Bond order is given by "half the number of these entities that are bonding, minus the number of these entities that are anti-bonding."

ANSWER: **molecular orbitals** [or **MOs**; prompt on **orbitals**]

[10] This is the simplest molecule that can be analyzed using molecular orbitals. This molecule has [read slowly] two bonding electrons and zero anti-bonding electrons, as well as having two protons and no neutrons.

ANSWER: molecular **hydrogen** [or **H-2**; do **not** accept or prompt on just "H"]

[10] Molecular orbitals are often complemented by the theory of hybridization. Hybrid orbitals are named using combinations of these *two* letters, which name the first two classes of atomic orbitals.

ANSWER: **s** AND **p** <AF>

18. The title idol gradually comes alive and destroys the narrator's life in this author's story "Chac Mool." For 10 points each:

[10] Name this author who tried to retell the whole of Hispanic history and culture all at once in his novel *Terra Nostra*.

ANSWER: Carlos **Fuentes** (Macías)

[10] Carlos Fuentes was an author from this North American country, as were Mariano Azuela and Octavio Paz. Ambrose Bierce's death in this country was described in Fuentes's novel *The Old Gringo*.

ANSWER: **Mexico**

[10] Fuentes's novel *Christopher Unborn* takes its basic structure from *this* novel by Laurence Sterne. This novel incessantly digresses from its story, so that the narrator only manages to get to his birth until Volume 3 (out of 4).

ANSWER: *The Life and Opinions of **Tristram Shandy**, Gentleman* <JR>

19. This chapter includes hit quotes like "when I became a man, I put away childish things" and "through a glass darkly." For 10 points each:

[10] Name this New Testament chapter that makes gives a huge list of properties of love, which is apparently "patient" and "kind."

ANSWER: **First** Epistle to the **Corinthians** Chapter **13** [prompt on partial answer]

[10] Like most of the other Epistles, First Corinthians is attributed to *this* Apostle, who changed his name from Saul after his conversion

ANSWER: Saint **Paul** [or **Paulus**; or **Paulos**]

[10] Paul's other Epistles include this hugely important book, which was the source of Luther's "salvation by faith alone." This epistle follows Acts and precedes First Corinthians.

ANSWER: Epistle to the **Romans** <JR>

20. In highly symmetric problems, this law is usually more cumbersome to use than Ampere's law. For 10 points each:

[10] Name this law, according to which the magnetic field at a point equals "mu-nought over 4-pi" times an integral with "one-over-*r*-squared" distance dependence.

ANSWER: **Biot-Savart** ["bee-oh-sah-VAR"] law

[10] The Biot-Savart law describes how a magnetic field is created from *this* flow of electrons in a wire. The SI unit for this quantity is the ampere.

ANSWER: electric **current** [prompt on *i*]

[10] The Biot-Savart law enforces the direction of the magnetic field by including *this* operation between the integration line element "*d-l*" and the displacement unit vector "*r*-prime".

ANSWER: **cross** product [do **not** accept or prompt on just "product"] <SE>

*Tiebreaker*

21. You're doing analytical chemistry and want to use spectroscopic methods. Answer some questions about what you're doing, for 10 points each.

[10] No matter what kind of spectroscopy you're doing, you identify compounds by their correspondence to features of the spectrum described by *this* term.

ANSWER: **peaks**

[10] You can use this law to find the concentration of a sample by measuring the ratio of the intensities of received and transmitted light. This law states that absorbance is proportional to the product of concentration and path length.

ANSWER: **Beer**–Lambert Law [or **Beer**'s Law; or Lambert–**Beer** Law or **Beer**–Lambert–Bouguer Law]

[10] You'd usually use Beer's law for compounds with an absorbance peak in this range of the electromagnetic spectrum. This region is surrounded by the infrared and ultraviolet ranges, and can be seen by human eyes.

ANSWER: **visible** range <CK>