

Harvard Fall Tournament X

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And with thanks to Will Holub-Moorman, MIT Quiz Bowl, and various playtesters



Finals 2

Tossups

1. **After one instance of death, these figures were reincarnated as catfish, and they used a bird with plaster and gypsum to poison one enemy. The grandparents of these figures replaced an enemy's jeweled teeth with white corn, and one of these figures was decapitated while in the (*) Bat House.** These figures vanquished Seven Macaw, and they avenged the deaths of their uncle and father at the hands of the Lords of Xibalba. The Popol Vuh is centered on the exploits of these figures who played a ball game against the gods of the dead. For 10 points, name this pair of figures from Mayan mythology.

ANSWER: **Hero Twins** (accept **Hunahpu and Xbalanque**; prompt if just one of those names is given)

2. **The Briggs-Rauscher oscillating reaction exhibits this color when iodide is absent from the solution and free iodine is allowed to accumulate. Azo dyes and nitro compounds display this color due to extensive conjugation and delocalization. At high pH values, chromate salts display this color, while milled (*) uranium oxides are found as a namesake powder of this color. The D lines of the Fraunhofer spectrum are of this color, and bromophenol blue turns this color below a pH of 3. In the flame test, sodium burns a bright version of this color. For 10 points, identify this color most commonly associated with the elements sulfur and gold.**

ANSWER: **yellow** (accept variants like **gold** (before mention) or **amber** but not "orange")

3. **The Christmas carol "Adeste Fideles" may contain coded references intended for these people. The Wade roads were built to ease military entry into regions of this group's influence. This group fought the Battle of Sheriffmuir, and it included (*) Rob Roy MacGregor.** This group was crushed by the Duke of Cumberland at Culloden, and they attempted revolts in "Fifteen" and "Forty-Five." This group's figureheads included the Old Pretender and Bonnie Prince Charlie, and it supported the heirs of James II. For 10 points, name this group of people who wanted to restore the Stuart line to the British throne.

ANSWER: **Jacobites**

4. **The Five Bulls and the Five Ranks describe the progress of adherents in this religious branch. "Transmission" refers in this branch to the lineage of its teachers, and the concept of *wu* or *mu* is translated as "nothingness" and is central to this branch. Practitioners of this branch attempt to reach the (*) states of *satori* or *kensho*.** Important texts in this branch are *The Gateless Gate* and *The Blue Cliff Record*, which contain many enigmatic stories called *koans*. This branch emphasizes reaching understanding using the namesake form of deep meditation. For 10 points, name this school of Buddhism commonly practiced in China and Japan.

ANSWER: **Zen Buddhism** (prompt on just "Buddhism" or "Chinese Buddhism" or "Japanese Buddhism"; prompt on "Mahayana Buddhism"; accept **Chan Buddhism**)

5. The lesser flamingoes of this land feature's region depend completely on the pink-colored Lake Natron in this land feature that is bounded on the west by the Ruwenzori and Mitumba Mountains. Lake Shala is the deepest lake found in the Ethiopian section of this land feature, of which the (*) Afar Triple Junction forms the northern end. This land feature's western branch contains Lake Tanganyika and Lake Malawi. The "Lucy" skeleton was discovered in one region of this land feature, suggesting it was a source of early human evolution. For 10 points, name this continental trench that runs from Mozambique to the Red Sea.

ANSWER: East African Rift (accept Great Rift Valley; anti-prompt [ask for less specific] on "Afar Depression" or "Afar Triangle")

6. Eleazer Taschereau, then the Archbishop of Quebec, condemned this group for secret rituals like the ones outlined in their manual, the *Adelphon Kruptos*. Anti-immigrant sentiments in this group may have led to a massacre of Chinese miners in Rock Springs, Wyoming. In 1886, this group organized a failed (*) strike against Jay Gould's Missouri Pacific Railroad. This group's "Grand Master Workmen" included Uriah Stephens and Terrence Powderly. This group collapsed after it was blamed for an incident in which a demonstration in Chicago was bombed, leading to the Haymarket Square Riot. For 10 points, name this radical 19th century labor union that eventually was eclipsed by the AFL.

ANSWER: Noble and Holy Order of the Knights of Labor

7. One artist born in this present-day country created a series of works he called "prouns." [pro-oons] An artist from this country painted a pyramid of human skulls in the desert in his *The Apotheosis of War*. A third artist from this country painted *Black Square* as part of the (*) Suprematist movement, while yet another artist born in this country inspired a German art group with his painting of a horse galloping across a hill, *The Blue Rider*. A painter born in what was then this country who later moved to France included a giant green face staring at a sheep in *I and the Village*. For 10 points, name this birth country of Marc Chagall, Wassily Kandinsky, and Kazimir Malevich.

ANSWER: Russian Federation (accept Rossiya; prompt on "Russian Empire" or "USSR" or "Union of Socialist Soviet Republics" or "Soviet Union;" accept Belarus after Marc is read; the first two artists mentioned are El Lissitzky and Vasily Vereshchagin)

8. With Sheldon Ebenholtz, this man proposed the idea that associations in the mind are formed symmetrically. This man examined the effect on impression formation by differing whether a person was called "warm" or "cold." This psychologist tested (*) prestige suggestion by attributing the same statement to Lenin and Jefferson. This man varied his most famous experiment by providing a "true partner" or changing the number of actors who purposefully incorrectly compared the lengths of some given lines. For 10 points, name this psychologist who performed a series of conformity experiments.

ANSWER: Solomon Asch

9. This government passed the "villainous laws" after Auguste Vaillant's bombing of its primary meeting place. The parliamentary character of this government was established following creation of the short-lived "Ordre moral" government and the dismissal of Jules Simon in the (*) Sixteenth of May Crisis. This government enacted the Jules Ferry Laws to reform secular education. Adolphe Thiers was effectively this government's first president, and it was created following the Paris Commune and the deposition of Napoleon III. For 10 points, name this French government that succeeded the Second Empire and preceded the Vichy Regime.

ANSWER: French Third Republic (accept La Troisième République)

10. Duke Ellington recorded a jazz version of this work that was pulled from shelves over concerns that it was offensive to its composer's home country. One part of this piece written for strings and triangle depicts the daughter of a Bedouin chief. One part of this work begins with a flute going down from B to E and back up again to B. (*) "Anitra's Dance" is one section of this work, while in another section, a melody that starts in the cellos, basses, and bassoons grows gradually louder and faster as the title character is chased by trolls. For 10 points, "Morning Mood" and "In the Hall of the Mountain King" are parts of what work by Edvard Grieg?

ANSWER: Peer Gynt

11. The behavior of systems at these states can be modeled by a set of exponents derived from field theory, which describe the power law behaviors of physical quantities as functions of 'reduced' properties of the system. For fluids, this state occurs when both the first and second partial derivatives of pressure with respect to volume are zero. In the (*) van der Waals model, the pressure at this point is $a/27b^2$. The enthalpy of vaporization approaches zero at this point. This point marks the end of the gas-liquid coexistence line. For 10 points, name this point on a phase diagram above which vapor and liquid phases are no longer distinguishable.

ANSWER: critical point (accept critical temperature or critical pressure, prompt on phase transition grudgingly)

12. One poem by this author describes a gnome named Umbriel who ventures into the Cave of Spleen as well as a sylph named Ariel who protects the girl Belinda. This writer crowned Colley Cibber as the "King of Dunces" in a poem celebrating the goddess (*) Dulness. This writer coined the quotations "a little learning is a dangerous thing" and "to err is human; to forgive divine," in addition to a poem describing the theft of some hair written in the style of a mock heroic epic. For 10 points, name this English satirist who wrote essays "on Man" and "on Criticism," as well as *The Rape of the Lock*.

ANSWER: Alexander Pope (*Ed's note: "a pope interred..."*)

13. One method for doing this technique in yeast cells involves lithium acetate, polyethylene glycol, and salmon sperm. Only competent species can undergo this technique, and this technique was discovered to occur naturally in pneumococcus bacteria. This technique can be performed with heat-shock treatment and in the presence of divalent cations like calcium. With (*) electroporation, this method increases membrane permeability. Reporter genes can be used to indicate the success of this technique whose eukaryotic subtype is known as transfection. For 10 points, name this technique used to introduce foreign DNA into a cell.

ANSWER: transformation

14. A girl flashes eyelids with "LOVE YOU" written on them at this character, who is told solemnly about some "bad dates." As Dietrich, Toht, and Bellocq are killed this character yells to Marion "Keep your eyes shut!," and he ends an assailant's (*) sword display by shooting him. This character is informed "top men" will examine an object, and he sadly wonders "Why did it have to be snakes?" In one scene, this character uses a bag of sand to replace a gold idol before fleeing from a rolling boulder. For 10 points, name this whip-cracking archaeologist from *Raiders of the Lost Ark*.

ANSWER: Henry Walton "Indiana" Jones, Jr. (accept any or all underlined parts; accept Indy in place of Indiana; accept "*Raiders of the Lost Ark*" before "character" is first read)

15. **Pierre Louis Napoleon Cavagnari signed the Treaty of Gandamak in this country with Mohammad Yaqub Khan. Reginald Dyer refused to honor a ceasefire request from Nadir Khan during one conflict in this country. This country's border with its eastern neighbor became the (*) Durand Line after the Treaty of Rawalpindi, and Elphinstone's column was lost on a retreat from this country. Britain fought several wars with this country in response to Soviet interests in it during the 1800s as part of the "Great Game." For 10 points, name this country whose more modern wars have included ones involving the U.S. and the Taliban.**

ANSWER: Afghanistan

16. **This mathematician names a formula that gives the Taylor series of the inverse of an analytic function, given the original Taylor series coefficients for the function. In his solution to the tautochrone problem, he showed minimizing a certain variational integral is equivalent to solving a differential equation named for him (*) and Euler. This mathematician proved that every natural number can be written as the sum of four squares, and constrained optimization problems employ his namesake "multipliers" symbolized lambda. For 10 points, name this mathematician whose namesake "points" are relative stationary points for a third body in a two-body gravitational system.**

ANSWER: Joseph-Louis Lagrange

17. **One character created by this author discovers his wife is having an affair with Bill Orcutt after he moves to Old Rimrock and marries a former Miss New Jersey named Dawn. Merry bombs a postal office in protest of the Vietnam War and abandons her father (*) Swede Levov in a novel by this author. This man wrote a short novella about Neil Klugman's disintegrating relationship titled *Goodbye, Columbus*, and his most famous novel is framed as the conversation between the title character and his psychoanalyst. For 10 points, name this Jewish-American author of *American Pastoral* and the sexually explicit *Portnoy's Complaint*.**

ANSWER: Philip Roth

18. **The architecture of Kanak huts inspired this man's design of a cultural center in New Caledonia, and he designed the Modern Wing of the Art Institute of Chicago. This architect designed an airport terminal with an airfoil-shaped roof which sits on an artificial island in (*) Osaka Bay. One of this man's buildings derives its name from criticism about it piercing "the heart of historic London," and he collaborated with Richard Rogers on a modern art museum in Paris whose façade features an array of exposed multicolored pipes. For 10 points, name this Italian architect of the Shard and the Pompidou Centre.**

ANSWER: Renzo Piano

19. **The maid Kitty falls in love with this character and reveals that her mistress is mad at this character for preventing her husband's death. This man is aided by the servant Planchet, and a woman who seduces John Felton poisons his love Constance Bonacieux. This character dies in (*) *The Vicomte of Bragelonne* after being told he will be the next Marshall of France, and in *Twenty Years After* he duels the son of his previous enemy Milady de Winter. This man makes enemies of Cardinal Richelieu after meeting his friends Athos, Aramis, and Porthos. For 10 points, name this character created by Alexandre Dumas who meets a certain Three Musketeers.**

ANSWER: d'Artagnan (do not accept or prompt on "Three Musketeers")

20. **This author created Harry Joy, who briefly dies and realizes he's living in Hell, as well as the 139-year old Herbert Badgery. This author of *Bliss* and *Illywhacker* wrote a book using poor spelling and grammar representative of the Jerilderie Letter written by the title (*) outlaw, who dons a set of armor and is killed in a shootout with the police. This author won his second Booker Prize for *True History of the Kelly Gang*, and he won his first for a book describing a bet to transport a glass church across the Outback. For 10 points, name this Australian author of *Oscar and Lucinda*.**

ANSWER: Peter Carey

21. **The azygos lobe can arise from congenital defects in this organ, and the apex of this organ contains a sulcus produced by the subclavian artery. This organ is the primary site where angiotensin I is converted to angiotensin II, and diseases that affect this organ include sarcoidosis, mesothelioma, and (*) COPD.** This organ is surrounded by two sets of serous membranes called pleurae, and this organ receives deoxygenated blood from the heart through the pulmonary artery. Consisting of up to 500 million alveoli, for 10 points, name this organ that facilitates gas exchange in most vertebrates through respiration.

ANSWER: **lungs**

Bonuses

1. A relatively unimportant work by this author is his novella *La Fanfarlo*. For 10 points each:

[10] Name this Frenchman better known for including sections like “Spleen and Ideal,” “Wine,” and “Death” in his collection *The Flowers of Evil*.

ANSWER: Charles **Baudelaire**

[10] This other Frenchman published his Symbolist masterpieces *A Season in Hell* and “The Drunken Boat” before he turned 21.

ANSWER: Arthur **Rimbaud**

[10] This other Symbolist wrote the Saturnine Poems, but he also carried on tempestuous relationship with Rimbaud that at one point led to him firing a gun at the young man.

ANSWER: Paul **Verlaine**

2. This man once referred to the argument for climate change as “absolute crap.” For 10 points each:

[10] Name this former Liberal prime minister of Australia who was recently ousted by Malcolm Turnbull.

ANSWER: Anthony John “Tony” **Abbott**

[10] One of Tony Abbott’s policies was the launch of Operation Sovereign Borders, an Australian Defence Force mission to prevent people from illegally doing this. Migrants caught trying to do this are sometimes detained in offshore centers.

ANSWER: **immigrate** (accept obvious equivalents)

[10] One of Australia’s more prominent detention centres is located in this Pacific island nation. This country became rich from extraction of its phosphate reserves, but now suffers from extensive unemployment.

ANSWER: Republic of **Nauru**

3. For a right triangle, this point lies at the midpoint of the hypotenuse. For 10 points each:

[10] Give the name for this point that is equidistant from all three of a triangle’s vertices. According to the extended law of sines, twice the distance from this point to any vertex of a triangle is the length of a side divided by the sine of the opposite angle.

ANSWER: **circumcenter**

[10] The circumradius of a regular polygon can be found by dividing the length of this segment by the cosine of π over n radians where n is the number of sides. It connects the center of a regular polygon with the midpoint of any side.

ANSWER: **apothem**

[10] The area of a regular polygon is one-half the length of the apothem times this quantity, which for an n -sided regular polygon is the product of n and the side length.

ANSWER: **perimeter**

4. Name these femme fatales of Greek mythology, for 10 points each:

[10] These figures engaged in a singing competition with the Muses, though their more typical past time was luring enchanted sailors to their deaths.

ANSWER: **Sirens**

[10] These bird-like monsters pestered the prophet Phineas until he was rescued by the Argonauts. These creatures were responsible for delivering the evil to the Furies.

ANSWER: **Harpies** (or **Harpy**)

[10] This woman was the mistress of Zeus before Hera cursed her to devour her children. She is typically depicted as half-serpent, and in turn gives her name to a race of half-snake, half-humans.

ANSWER: **Lamia**

5. Name some things related to the legendary football announcing of Al Michaels, for 10 points each:

[10] Al Michaels exclaimed “Unreal!” after this team’s Malcolm Butler intercepted the ball to end Super Bowl 49. In contrast, Joe Buck mundanely stated “It is caught” after the helmet catch against this team in Super Bowl 42.

ANSWER: **New England Patriots** (accept either or both)

[10] Al Michaels responded by saying “No good” and this two word phrase after Scott Norwood’s field goal against the Giants missed by a foot in Super Bowl 25.

ANSWER: **Wide Right**

[10] Al Michaels exclaimed, “Can he get in? No, he cannot!” after this player caught the ball in the final play of Super Bowl 34. More famously, radio announcers exclaimed this receiver was “one yard short.”

ANSWER: **Kevin Dyson**

6. Heritable mutations in the BRCA1 or BRCA2 genes increase an individual’s susceptibility to this disease. For 10 points each:

[10] Name this disease. It can be detected with a mammogram, and the most common treatment is a mastectomy followed by chemotherapy.

ANSWER: **breast cancer** (prompt on “cancer”)

[10] Triple-negative breast cancers are difficult to treat since they lack receptors for this steroid hormone that is *not* estrogen. Falling levels of this sex hormone following the absence of fertilization triggers menstruation.

ANSWER: **progesterone**

[10] Drugs that target this enzyme are ineffective in triple-negative breast cancer, since tumors do not depend on estrogen to proliferate. This cytochrome P450 enzyme catalyzes the conversion of testosterone to estradiol.

ANSWER: **aromatase** (accept **estrogen synthetase**, **estrogen synthase**, or **CYP19A1**)

7. One member of this family was the first person in history to resign the office of cardinal. For 10 points each:

[10] Name this family, whose other religiously influential members included Pope Alexander VI. This family’s name has become a byword for scandalous behavior thanks to incestuous and criminal members like Cesare and Lucrezia.

ANSWER: **Borgia** family

[10] One of Cesare Borgia’s most infamous acts was this debauched party. Cesare invited fifty prostitutes to this event, which was named for the items strewn on the ground for the courtesans to pick up.

ANSWER: **Banquet of the Chestnuts** (or **Ballet of the Chestnuts**)

[10] Alexander VI’s successor as pope, Pius III, died a month into the job and was replaced by this man, an avowed enemy of the Borgias. This “Warrior Pope” commissioned Michelangelo’s frescos on the ceiling of the Sistine Chapel.

ANSWER: **Julius II** (or Giuliano **della Rovere**; prompt on just “Julius”)

8. A creepy face stares out of a tree at the top of this work. For 10 points each:

[10] Name this work, in which two naked men, one of them holding a bowl, emerge from the water. The title vessel of this work is filled with people carousing, eating, and playing music.

ANSWER: **Ship of Fools**

[10] *Ship of Fools* is a work by this artist, who included a bunch of weird imagery, like a dude trapped in a mussel shell, in his *The Garden of Earthly Delights*.

ANSWER: Hieronymus **Bosch** (accept Jheronimus van **Aken**)

[10] Bosch also created a depiction of this Biblical location. A work showing a wedding at this place by Veronese hangs across from the *Mona Lisa* and is the largest painting at the Louvre.

ANSWER: **Cana** (accept *The Marriage Feast at Cana*; accept *The Wedding at Cana*)

9. Answer some questions about American immigrant literature, for 10 points each:

[10] Lines from the Emma Lazarus poem “The New Colossus” adorn this monument. “The New Colossus” imagines this monument asking for “huddled masses yearning to breathe free.”

ANSWER: **Statue of Liberty**

[10] This collection of vignettes was written by Sandra Cisneros, and describes the Mexican-American Esperanza’s coming of age in the title Chicago neighborhood.

ANSWER: **The House on Mango Street**

[10] Several interactions between Americans and Indian immigrants are described in stories from this short story collections, such as “Sexy” and “The Third and Final Continent.” In the title story of this collection, Bobby is rescued from a group of hungry monkeys.

ANSWER: **Interpreter of Maladies** (the author is Jhumpa Lahiri)

10. Aphra Behn was a female playwright from this period. For 10 points each:

[10] Name this period of English literature that flourished under the rule of Charles II. Popular authors of this period included William Wycherly and William Congreve.

ANSWER: **Restoration** period (accept basically anything mentioning **Restoration**)

[10] This Restoration playwright savaged his contemporary Thomas Shadwell in the play *MacFlecknoe*. He also wrote the satire *Absalom and Achitophel* and the tragedy *All for Love*.

ANSWER: John **Dryden**

[10] Dryden completed a verse translation of this work, whose literary aspects include a long allegory comparing a city’s workers to bees and a character whose overarching attribute is *pietas* [“pee-eh-tas”].

ANSWER: **The Aeneid**

11. [NOTE TO MODERATOR: do not reveal alternate answers to the first part unless already given]

The part for the contrabassoon in this work has only one note, a single B to begin the final movement. For 10 points each:

[10] Name this symphony, whose four movements are played in *attacca subito* style, that is, with no breaks in between. It features a prominent “timpani duel” in the fourth movement.

ANSWER: the “**Inextinguishable**” Symphony (accept, but *do not otherwise reveal*: Carl **Nielsen**’s Symphony No. **4** - need both underlined parts; prompt on partial)

[10] The “Inextinguishable” Symphony is the fourth by this Danish composer, who wrote a work commemorating the 100th anniversary of the birth of his fellow countryman Niels Gade [“GAH-thuh”].

ANSWER: Carl (August) **Nielsen**

[10] Nielsen also wrote several works in this genre. Felix Mendelssohn wrote the music for another one of these works titled “Hark! The Herald Angels Sing,” while another example is “Good King Wenceslas.”

ANSWER: Christmas **carols** (accept other descriptive answers mentioning **Christmas**)

12. C.S. Peirce [“purse”] defined these entities using a triadic relationship, connecting them to the object and the interpretant. For 10 points each:

[10] Name this units of meaning that are studied in semiotics. Icons and symbols are good examples.

ANSWER: **signs** (accept word forms)

[10] This man’s *Course in General Linguistics* examines what he called semiology. He described the sign as a double entity of “signified” and “signifier.”

ANSWER: Ferdinand de **Saussure**

[10] The semiotics of a Balzac short story were studied in this work by Roland Barthes [“bart”]. It posits various codes of meaning, such as the hermeneutic code and the semic code.

ANSWER: **S/Z**

13. Two characters in this opera agree to fight a duel in the graveyard of the Ravenswood family. For 10 points each:

[10] Name this opera, based on a novel by Sir Walter Scott. Its title character sings “Il dolce suono” during a famous “mad scene” after she kills her new husband Arturo.

ANSWER: Lucia di Lammermoor

[10] *Lucia di Lammermoor* is an opera by this Italian, who also included the aria “Una furtiva lagrima” in *The Elixir of Love*.

ANSWER: (Domenico) Gaetano (Maria) Donizetti

[10] “Una furtiva lagrima” is sung by Nemorino, a character with this vocal range. Of the four major S-A-T-B vocal parts, this one is the highest male voice.

ANSWER: tenor (do not accept any other types of tenor)

14. Name the African country by its authors, for 10 points each:

[10] Naguib Mahfouz’s *Palace Walk*, *Palace Desire*, and *Sugar Street* constitute his Cairo Trilogy set in this country.

ANSWER: Arab Republic of Egypt

[10] Ngũgĩ wa Thiong’o is a writer from this country who proactively made the switch from using English to this country’s native Kikuyu. Karen Blixen wrote a memoir about living in this country.

ANSWER: Republic of Kenya

[10] Leopold Senghor was both a president of this country and a member of the Negritude movement. Mariama Ba’s *So Long a Letter* is set in this country.

ANSWER: Republic of Senegal

15. This document first appeared in print in the book *Mourt’s Relation*. For 10 points each:

[10] Name this document, which may have been drafted after its writers ran out of beer. This document calls for the creation of a “civil body politic.”

ANSWER: Mayflower Compact

[10] This signer of the Mayflower Compact served as commander of the Plymouth militia, where he led attacks against the Nemasket and Wessagusset Native Americans.

ANSWER: Myles Standish

[10] *Mourt’s Relation* also includes an account of the first celebration of this holiday at Plymouth. Abraham Lincoln made this fall celebration a national holiday in 1863.

ANSWER: Thanksgiving

16. A period of secularization in this region was known as the Quiet Revolution. For 10 points each:

[10] Name this region. The kidnapping of James Cross and Pierre Laporte by the FLQ led to the October Crisis in this region.

ANSWER: Quebec

[10] The failed Meech Lake Accord, which sought to increase Quebec’s provincial powers, was proposed by this Canadian prime minister of the late 1980s. He was succeeded by the first female PM, Kim Campbell.

ANSWER: Martin Brian Mulroney

[10] While in office, Mulroney signed the Canada-United States Free Trade Agreement. That document was superseded in 1994 by the passage of this legislation, which included Mexico in the agreement as well.

ANSWER: North American Free Trade Agreement

17. Adherents of this religion believe in an apocalyptic event whose name literally translates as “making excellent,” the *Frashokereti*. For 10 points each:

[10] Name this Persian religion, known for constructing Towers of Silence to place their dead. Its sacred texts are known as the *Avesta* and it worships the god Ahura Mazda.

ANSWER: **Zoroastrianism** (accept word forms; prompt on “Mazdaism”)

[10] This evil figure in Zoroastrianism is the leader of a group of demons known as *daevas*. An offshoot branch of Zoroastrianism known as Zurvanism considers this being as Ahura Mazda’s twin brother.

ANSWER: **Ahriman** (or **Angra Mainyu**)

[10] According to legend, this other figure in Zoroastrianism will spend the first 17 years of his life eating only vegetables. This messianic figure will then resurrect the dead after bringing about the *Frashokereti*.

ANSWER: **Saoshiyant**

18. The half-life of this element’s 238 isotope is 4.5 billion years, which is approximately the age of the earth. For 10 points each:

[10] Name this actinide element whose 235 isotope can sustain a fission chain reaction. In nature, it is primarily found in the minerals pitchblende and carnotite.

ANSWER: **uranium**

[10] Uranium-238’s decay eventually ends in lead-208, which is exceptionally stable since its atomic mass can be described by this term. Isotopes whose nucleon numbers are described by this term have a higher-than-average nuclear binding energy.

ANSWER: **magic numbers**

[10] Some nuclear physicists propose that isotopes within this region of the table of nuclides will be relatively stable if they have a magic number of protons or neutrons. Flerovium-298 and ununbium-302 are predicted to be within this region.

ANSWER: **island of stability**

19. Joseph Rayner Stephens said that this movement was a “knife and fork, a cheese and bread” question. For 10 points each:

[10] Name this mid-19th century political movement in Britain whose namesake document included universal suffrage and payment for members of Parliament.

ANSWER: **Chartism** (accept word forms)

[10] Chartists pushed for universal suffrage for those over this age. This was the voting age in most of the United States until the passage of the 26th Amendment.

ANSWER: **21**

[10] Another Chartist demand was the secret ballot, which is alternatively named for this country. The so-called “First Fleet” transported the initial settlers of this country.

ANSWER: Commonwealth of **Australia**

20. In quantum mechanics, the Schrodinger equation is simply an eigenvalue equation for this operator. For 10 points each:

[10] Name this operator that is the generator of time evolution. The form of mechanics of the same name as this operator was developed by an Irish physicist from Lagrangian mechanics.

ANSWER: **Hamiltonian**

[10] Applying the bracket named after this man between the time-evolution of any function on phase space and the Hamiltonian gives the time-evolution again and the explicit dependence on time. This Frenchman also names a second-order differential equation stating that “del-squared phi [“fee”] equals f.”

ANSWER: Siméon Denis **Poisson**

[10] In classical mechanics, the Hamiltonian of a system is equal to the sum of the potential and kinetic types of this scalar. For an isolated system, this quantity is conserved over time, according to the first law of thermodynamics.

ANSWER: **energy**

21. James T. Farrell’s *Studs Lonigan* trilogy is set in this city. For 10 points each:

[10] Name this city which is described as “Hog Butcher for the World” in a namesake poem by Carl Sandburg.

ANSWER: **Chicago**

[10] This author’s *The Adventures of Augie March* opens with the line “I am an American, Chicago born.” This author also wrote about the letter-writing *Herzog*.

ANSWER: Saul **Bellow**

[10] “Frankie Machine” struggles in the underbelly of Chicago in this Nelson Algren novel. The title was inspired by a phrase Algren heard a bookie use.

ANSWER: *The **Man with the Golden Arm***

