

COLLABORATIVE ACADEMIC SPRING TOURNAMENT 2019

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PACKET 4 TOSSUPS

1. **A megger is used to measure large values of this quantity. This quantity is added to reactance times the imaginary unit to calculate a quantity symbolized Z. This quantity can be calculated by multiplying a related quantity rho times length over cross-sectional area. Power is equal to the product of this quantity and (*) current squared. Wheatstone bridges are rudimentary devices for measuring this quantity, which is the reciprocal of conductance. Voltage divided by current gives, for ten points, what electrical quantity measured in ohms?**

ANSWER: **resistance** <AG>

2. **This nation's highest point is technically the stratovolcano Mount Scenery, which overlooks a town fittingly called "The Bottom." Many residents of an archipelago owned by this country speak the creole language Papiamentu. This country's islands of Saba and Sint Eustatius lie south of a (*) Leeward Island that this country shares with France. This nation's Caribbean possessions include Sint Maarten and Bonaire, which is one of its ABC Islands along with Aruba and Curacao. For 10 points, name this European country whose overseas territories are administered from Amsterdam.**

ANSWER: The **Netherlands** (accept **Holland**) <JA>

3. **In one novel by this author, Therese Lafirme tries to convince David Hosmer to remarry his ex-wife Fanny. One of this author's characters spends fifteen dollars on a fancy lunch and the title lavish garments. This author also wrote a story in which Armand Aubigny ("aw-bin-YEE") burns a letter revealing he is half-black after sending away his wife for having a mulatto child. The protagonist of one of her novels listens to Mademoiselle (*) Reisz's ("rice's") piano recital before returning to Grand Isle, where she met Robert Lebrun. For 10 points, name this author of "A Pair of Silk Stockings" and "Desiree's Baby," who wrote about the drowning of Edna Pontellier in *The Awakening*.**

ANSWER: Kate **Chopin** [accept Catherine **O'Flaherty**] <NS>

4. **During this conflict, the cruiser *Novik* was wrecked at the Battle of Korsakov. The *Gromoboi* suffered heavy damage during the Battle of Ulsan in this conflict. One side in this war fired on British fishing vessels at Dogger Bank. General Kuropatkin was defeated at the Battle of (*) Mukden during this conflict, which followed a siege of Port Arthur by General Tojo. This conflict, concluded by the Treaty of Portsmouth, ended with the destruction of the Baltic Fleet at Tsushima Straits. For 10 points, name this 20th-century conflict fought over imperialism in Manchuria and Korea that resulted in an Asian nation's victory over Nicholas II.**

ANSWER: **Russo-Japanese War** <NS>

5. **The pIII ("p-3") protein of the M13 type of these organisms is used in their namesake "display" libraries. One of these organisms provided selection pressure in the Luria-Delbruck ("LOO-ree-uh DEL-brook") experiment. Most DNA ligase used in laboratories is isolated from a third one of these organisms. Sulfur-35 and Phosphorus-32 were used to label these organisms to show that DNA contains the (*) information for inheritance in the Hershey-Chase experiment. Joshua and Esther Lederberg studied the lambda type of these organisms, which often infect *E. coli*. For 10 points, name these viruses which infect bacteria.**

ANSWER: bacteri**ophages** [prompt on **viruses**] <GC>

6. It's not Japan or Lebanon, but one CEO from this country is in prison for accounting fraud after being forced to step down as chairman of Nissan. In an interview with Ellen Page, this country's president insisted that he didn't mean for his past homophobic comments to apply to her. This is the birthplace of businessman Carlos Ghosn ("GOHN"). This country impeached its president in 2016 as part of the (*) "Car Wash" corruption investigation. This country's Workers' Party nominated Fernando Haddad for president after the popular Lula da Silva was barred from running. For 10 points, name this country where Jair Bolsonaro won a recent presidential election.

ANSWER: Federative Republic of Brazil <GP>

7. A pink paper crown hangs from a green curtain behind a person of this type in a painting by Pieter Bruegel the Elder. A one-eyed woman of this type stares eagerly ahead in the fifth plate of *A Rake's Progress*, whose central scene is parodied by two dogs in the lower right. Nine "malic molds" attempt to reach a woman of this type using a chocolate grinder in a (*) Marcel Duchamp work also known as *The Large Glass*. In another work, a small dog stands at the feet of a woman of this type who appears to be pregnant and wears a green dress. For 10 points, name this type of woman, one of whom takes part in the titular ceremony of *The Arnolfini Wedding*.

ANSWER: bride [prompt on woman before mention, accept answers indicating that the woman is getting married] <JA>

8. In this election, James Bayard played an important role by convincing his allies in Maryland and Vermont to cast blank ballots. As a result of this election, the first peaceful transition of power in American history was achieved. In his inaugural address, the winner of this election stated "we are all federalists, we are all republicans." This was the last election before the (*) 12th Amendment was passed, which is why two running mates from the Democratic-Republican party finished in the top two. For 10 points, name this election where Alexander Hamilton decisively backed Thomas Jefferson to defeat Aaron Burr and succeed John Adams as president.

ANSWER: the United States presidential election of 1800 [prompt on answers describing the election where Jefferson beat Burr by asking "what year?"] <AN>

9. One of these locations is where the main character heals people in Martin Amis's novel *Time's Arrow*. People in this location were classified as "drowned" or "saved" in *If This is a Man*, a book which takes place in one of these locations. In one of these locations, the question "Where is God now?" is answered with "He is (*) hanging here on this gallows." Art Spiegelman created a graphic novel about his parents' experiences in one of these locations, called *Maus*. A girl who refers to her diary as Kitty died in one of these locations. For 10 points, name these locations, the setting of *Night* and *We Were in Auschwitz*.

ANSWER: concentration camps [or death camps, or extermination camps, accept specific locations like Auschwitz or Birkenau] <GC>

10. The absorption spectrum of this element contains Schumann-Runge ("SHOO-mahn ROON-guh") bands. Banded iron formations date to periods when this element was abundant. The Chapman cycle produces one allotrope of this element, whose concentration is measured in Dobson units. Levels of this element increased rapidly in a "great event" named for it, largely due to (*) cyanobacteria. Chlorine radicals convert one allotrope of it into its molecular form, leading to decreased absorption of UV rays. This element was called "dephlogisticated air" by Joseph Priestley. For ten points, name this element present in ozone.

ANSWER: oxygen <AG>

11. A piece of this type featuring a quartet of brass bands commemorates soldiers who died during the July Revolution and was composed by Hector Berlioz. A work of this type by Giuseppe Verdi honoring Alessandro Manzoni includes four offstage trumpets in its "Tuba Mirum" section. A solo soprano sings the Pie Jesu ("pee-AY YEH-soo") section of a work of this type by Gabriel Fauré. The (*) Dies Irae ("DEE-es EE-ray") of an unfinished piece of this type, which was finished by Franz Sussmayr, breaks off eight bars into the famous *Lacrimosa* section. Mozart died before he could complete a piece in this genre in D minor. For 10 points, identify this type of Catholic mass for the dead.

ANSWER: **requiem** mass [prompt on mass or mass for the dead, accept *Grande Messe des Mortes*; accept Mozart's **Requiem** Mass] <NS>

12. This man is given one thousand pieces of silver by a king of Gerar. This man failed to find ten righteous men inside a certain city, condemning that city to destruction. This figure fathered Midian with Keturah after burying his first wife in the cave of Machpelah. That wife forced him to banish his concubine (*) Hagar into the desert after she bore him the son Ishmael. God promises this man that his descendants will be as numerous as the stars of heaven after ordering him to sacrifice his son. For 10 points, name this figure from the Book of Genesis, the first of the Biblical patriarchs and father of Isaac.

ANSWER: **Abraham** [or **Abram**] <JA>

13. This action is sometimes used to title a Horace ode that describes Augustus' defeat of Cleopatra. The opening line of that poem proclaims "Now is the time" for performing this action. An Edwin Arlington Robinson poem about a figure "born too late" ends with Miniver Cheevy coughing and continuing to perform this action. The narrator of a Chinese poem titled for this action hopes to reunite with friends on the (*) "Cloudy River of the Sky" after undertaking this action with the moon and his shadow. Li Po wrote about performing this action "Alone by Moonlight" using a cup of wine. For 10 points, name this practice of consuming alcohol.

ANSWER: **drinking** [accept equivalent] <JA>

14. After Carina uses one of these objects to destroy his home, the purchaser of one of them is mocked by Howard the Duck for letting a dog lick his face. In another film, Bor places one of these objects inside a column of rock and hides it on Svartalfheim. After traveling to Vormir, a character obtains one of these objects by pushing his adopted daughter off of a (*) cliff. The Tesseract is powered by one of these objects named for "space." After placing six of these objects into a gauntlet, Thanos snaps his fingers to destroy half of the life in the universe. For 10 points, name these powerful gems, the subject of a namesake "war" in a 2018 Avengers movie.

ANSWER: **Infinity** Stones [accept **Infinity** gems, prompt on descriptive answers or answers related to stones or gems] <JA>

15. According to Diodorus Siculus, the walls of this city were built by a female ruler who later fought Stabrobates in a failed invasion of India. The conquest of this city is described on a cylindrical artifact discovered here in 1879, which includes what may be the earliest declaration of human rights. This home of Semiramis ("seh-mee-ram-iss") and Nabonidus ("nah-boh-NYE-duss") was the subject of a 539 BC invasion by (*) Cyrus the Great that freed the Jews from a namesake exile in this city. Marduk was the patron god of this city, whose king Nebuchadnezzar ("NEH-boo-cud-NEZ-er") II may have built one of the Seven Wonders of the Ancient World. For 10 points, name this city in modern-day Iraq that was once home to the Hanging Gardens.

ANSWER: **Babylon** [or the Hanging Gardens of **Babylon**] <JA>

16. **These materials have a solidus and liquidus temperature. Some of these materials can undergo a diffusionless transform from austenite (“AW-sten-ite”) to martensite. A type of these materials returns to their original shape after being deformed and heated - those are their “shape-memory” type. These materials are substitutional when all the atoms that comprise them have about the same atomic (*) radius. Ferrite is a specific phase of one of these materials made in the Bessemer (“BESS-uh-mer”) process and comprised of iron and carbon. These materials are solid solutions. For 10 points, what materials are a mixture of two or more metals and include brass, bronze and steel.**

ANSWER: alloys [or solid solutions until mentioned; accept steel before mention since several of the clues apply specifically to it; prompt on “metals”, “mixtures”, “solutions”] <GC>

17. **The 1926 General Strike in Britain was called after a dispute involving workers who produced this commodity. The Battle of Orgreave took place during a 1984 strike of workers who produced this commodity that was led by Arthur Scargill. This commodity was plentiful in the Ruhr Valley, and Humphry Davy helped make the extraction of this commodity easier with his namesake (*) lamp. Robert Schumann issued a declaration in support of an organisation partially named for this commodity and steel, the predecessor to the European Union. For 10 points, name this black rock that was burned as fuel.**

ANSWER: coal [or coal and steel] <GP>

18. **In a play by this author, an emperor who is released from a cage only to be used as a footstool kills himself by bashing his head against the bars. In that play by this author, a character who betrayed Cosroe burns a copy of the Qu’ran and becomes emperor of Persia. A character created by this author places horns on the head of Alexander the Great and asks “was this the (*) face that launched a thousand ships?” after summoning Helen of Troy with the help of Mephistopheles. He wrote a play in which Barabas seeks vengeance after his wealth is stolen to pay tribute to invading Turks. For 10 points, name this British playwright of *Tamburlaine*, *Doctor Faustus*, and *The Jew of Malta*.**

ANSWER: Christopher Marlowe [or “Kit” Marlowe] <NS>

19. **While working under Eugen Bleuler (“OY-gen BLOY-ler”) at a schizophrenia hospital, this man developed his concept of a “feeling-toned complex” after conducting his “word association” experiment. One concept developed by this man describes events with no causal connection that seem meaningfully related. He identified the “eternal child” and “wise old man” as shadow (*) archetypes (“AHR-ki-types”), a term he also used to describe the animus and anima in his theory of the collective unconscious. His description of the Electra complex built off of the ideas of his former mentor Sigmund Freud. For 10 points, identify this Swiss founder of analytical psychology.**

ANSWER: Carl Jung <JA>

20. **The Mayans attributed the existence of these phenomena to a son of Seven Macaw named Cabrakan (“CAH-bruh-khan”). The epithet “enosichthon” (“EN-oh-SICK-thon”) recognizes the role of Poseidon in creating them. In Japanese mythology, the catfish Namazu causes these phenomena when Kashima fails to pin him under a rock. In the Poetic Edda, these events occur when Sigyn (“SIG-in”) pauses to empty a (*) bowl of serpent venom, and are caused by Loki writhing in pain as poison drips onto his face. The Greeks believed that Poseidon slammed down his trident to cause, for 10 points, what natural disasters in which the ground shakes?**

ANSWER: earthquakes [or tremors; or quakes; prompt on mountains before “catfish”] <JA>

PACKET 4 BONUSES

1. In this play, Trigorin compares the death of a certain animal to a woman who lives alone until a man arrives and “destroys her out of sheer boredom”. For 10 points each:

[10] Name this play that chronicles Konstantin Treplyev’s unrequited love for the aspiring actress Nina. Konstantin shoots the title creature and places it at Nina’s feet in this play’s second act.

ANSWER: *The **Seagull***

[10] *The Seagull* was written by this Russian dramatist, whose other plays include *The Three Sisters* and *The Cherry Orchard*.

ANSWER: Anton **Chekhov**

[10] In this Chekhov play, the title character attempts to shoot Professor Seberakoff, who had earlier called him a “perfectly dreadful man.”

ANSWER: ***Uncle Vanya*** <JA>

2. This event led William Randolph Hearst (“HURST”) and Joseph Pulitzer to publish incendiary articles, which were some of the first examples of yellow journalism. For 10 points each:

[10] Identify this event, the explosion of a ship in Havana Harbor that was most likely caused by a coal fire.

ANSWER: the **sinking** of the USS **Maine** [accept any answer involving **destroying** the USS **Maine**]

[10] The sinking of the USS Maine led the US to involvement in this conflict, which resulted in the handing over of the Philippines and Puerto Rico from a certain country.

ANSWER: **Spanish-American War**

[10] This letter, written by the Spanish Ambassador to the U.S., revealed McKinley to be a “low politician” who lacked authority. Cuban revolutionaries intercepted the letter and released it to Hearst, fueling U.S. aggression.

ANSWER: the **De Lome** letter [accept anything referring to the letter of Enrique Dupuy **De Lome**] <NS>

3. From 1958 to 1960, this company made the Edsel, which became a massive commercial flop. For 10 points each:

[10] Name this auto company headquartered in Dearborn, Michigan. Its popular models include the F-150 and the Mustang.

ANSWER: **Ford** Motor Company

[10] O.J. Simpson was the subject of a televised low-speed police chase while driving a white Ford model named for one of these things. An NFL team with this nickname won back-to-back Super Bowls under quarterback John Elway.

ANSWER: **bronco** [or Denver **Broncos**]

[10] This auto company headquartered in India bought Jaguar and Land Rover from Ford in 2006. This company sold the Nano, which was the cheapest car ever brought to market at \$1,500.

ANSWER: **Tata** Motors [or **Tata** Motors Limited] <WG>

4. This statement can be derived from equating chemical potential between two phases before using the Gibbs-Duhem (“DOO-em”) relation to rewrite chemical potential. For ten points each:

[10] Name this relation which expresses the slope of a tangent line to a phase boundary in terms of specific entropy and specific volume.

ANSWER: **Clausius-Clapeyron** (“CLAWS-ee-us CLAP-ee-ron”) equation

[10] The left hand side of the Clausius-Clapeyron equation takes the derivative of this quantity with respect to temperature. This quantity, commonly measured in atmospheres, is plotted with temperature on a phase diagram.

ANSWER: **pressure**

[10] The Clausius-Clapeyron equation can be written in terms of the change in specific volume, temperature, and this quantity. This quantity is the amount of energy needed for a first-order phase transition, like melting a solid.

ANSWER: specific **latent heat** [prompt on **heat**] <AG>

5. Diana Wynne Jones parodied F. Scott Fitzgerald's use of a fictional quote as one of these statements in *The Tough Guide to Fantasyland*. For 10 points each:

[10] This portion of *Howards End* is unusual in that it is a two word quote from the novel itself, "Only connect."
Usually, these literary quotations draw from an outside work, preceding the main text of a book or poem.

ANSWER: **epigraphs**

[10] *Howards End* was written by this British author of *A Passage to India*. In his novel *Maurice*, the title gay man lives happily ever after with Alec Scudder.

ANSWER: E.M. **Forster** [or Edward Morgan **Forster**]

[10] The epigraph of this poem, "I want to die," is taken from a passage in the *Satyricon*. This T.S. Eliot poem was edited by Ezra Pound and begins by stating that "April is the cruellest month."

ANSWER: "The **Waste Land**"

6. Answer the following about sports... in classical music. For 10 points each:

[10] This composer wrote a ballet in which three young people search for a lost tennis ball in his *Jeux*. He wrote the *Children's Corner Suite* and the *Suite Bergamasque*.

ANSWER: Claude **Debussy**

[10] *The Golden Age*, a ballet by Dmitri Shostakovich, centers on this sport. Edward Elgar is believed to have created the first chant for this sport called "He Banged the Leather for Goal" for its raucous British fans.

ANSWER: **soccer** [accept **football**; do NOT accept or prompt on "American football"]

[10] This other composer depicted a bouncing tennis ball among other sports equipment in his *Sports et divertissements*, but he may be better known for his six *Gnossiennes* ("no-SEE-en") and the ballet *Parade*.

ANSWER: Erik **Satie** [or Erik Alfred Leslie **Satie**] <NS>

7. Judith Butler defined this concept as the "cultural interpretation or signification" of a certain "biological facticity." For 10 points each:

[10] Name this concept that Butler declared "performative" in a book titled for its namesake "trouble."

ANSWER: **gender**

[10] Butler's book *Gender Trouble* is subtitled for "Feminism and the Subversion" of this concept. Erik Erikson described a namesake "crisis" of this concept that occurs due to role confusion in adolescence.

ANSWER: **identity**

[10] *Gender Trouble* identifies this practice as an example of the performative nature of gender that challenges the "originality" of heterosexuality. This artform typically involves crossdressing and is practiced by namesake "queens" like RuPaul.

ANSWER: **drag** <JA>

8. This molecule undergoes a rotation when transported due to the electric field created by the NPA motif of certain transport proteins. For ten points each:

[10] Name this molecule which crosses membranes through aquaporins. The dissociation of two moles of it into two moles of hydrogen gas and one mole of oxygen gas allows for ATP production at the end of photosynthesis.

ANSWER: **water** or **H2O**

[10] Solute balance is maintained by aquaporins in the collecting duct of this organ. This organ's descending loop of Henle ("HEN-lee") is permeable only to water, and along with the ascending loop, makes up part of the nephron ("NEFF-ron").

ANSWER: **kidney**

[10] The release of this hormone triggers the insertion of aquaporins into the collecting duct membrane, thereby increasing the reabsorption of water and the solute concentration of urine.

ANSWER: **anti-diuretic hormone** or **ADH** [also accept arginine **vasopressin** or **argipressin**] <AG>

9. This play, which forms a trilogy with *Laius* (“LAY-uss”) and *Oedipus* (“ED-uh-puss”), features a woman who disobeys a newly passed law and insists that she will bury her brother. For 10 points each:

[10] Identify this play whose central group led by Polynices (“pol-uh-NY-seez”) attempts to take over the title city.

ANSWER: **Seven Against Thebes**

[10] This ancient Greek playwright wrote *Seven Against Thebes* as well as *The Libation Bearers*. He was one of the three major Greek dramatists alongside Sophocles (“SOFF-oh-clees”) and Euripides.

ANSWER: **Aeschylus** (“ESS-kuh-luss”)

[10] This character is the namesake of a trilogy by Aeschylus which includes *The Libation Bearers*. This man, the brother of Electra, murders Clytemnestra (“CLI-tem-NESS-truh”) and Aegisthus (“ee-JIS-thuss”).

ANSWER: **Orestes** (“oh-RESS-teez”) <NS>

10. The Secret Army Organization attempted to assassinate Charles de Gaulle for his involvement in signing this treaty. For 10 points each:

[10] Name this treaty signed between France and the FLN that ended a civil war in an African country.

ANSWER: **Évian** Accords

[10] The FLN was the principal nationalist movement during the 1950s in this large North African country to the west of Libya.

ANSWER: **Algeria** [or People’s Democratic Republic of **Algeria**; or French **Algeria**]

[10] The Algerian War of Independence led to the collapse of the French republic of this number. The Knights Templar were disbanded under a French king of this regnal number nicknamed “The Fair.”

ANSWER: **four** [or French **Fourth** Republic; or Philip **IV**] <NS>

11. A theorem which states that the sum of the product of opposite sides is equal to the product of diagonals only applies to these figures. For 10 points each:

[10] Name these figures whose area can be found using Brahmagupta’s (“BRAH-mah-GOOP-tah’s”) formula.

Isosceles (“eye-SAW-suh-leez”) trapezoids are always one of these specific figures.

ANSWER: **cyclic** (“SIK-lik”) **quadrilaterals** [prompt on **quadrilaterals**; accept but do NOT reveal **quadrilaterals** that can be **inscribed** in **circles**]

[10] The defining property of cyclic quadrilaterals is that they can be inscribed in these shapes, whose three-dimensional analogue is a sphere. Every point on one of these shapes is equidistant from a central point.

ANSWER: **circle**

[10] Brahmagupta’s formula can be extended to find the area of any quadrilateral by adding a term equal to the product of all four sides times this trigonometric function squared. This function’s reciprocal is secant.

ANSWER: **cosine** [accept “**cosine** of x” or other equivalents] <AG>

12. In this painting, Ptolemy (“TOLL-eh-mee”) holds a globe and Zoroaster holds a celestial sphere. For 10 points each:

[10] Name this fresco set in Plato’s Academy which depicts various thinkers from the Classical to Renaissance eras.

ANSWER: The **School of Athens** [or **Scuola di Atene**]

[10] This artist painted *The School of Athens*. Along with Leonardo and Michelangelo, he is considered one of the greatest artists of the High Renaissance.

ANSWER: **Raphael** [or Raffaello **Sanzio** da Urbino]

[10] Raphael made ten of these preparatory drawings for tapestries commissioned by Pope Leo X. This word gained its modern meaning from an 1843 John Leech illustration published in *Punch* Magazine.

ANSWER: **cartoons** [accept the **Raphael Cartoons**] <WG>

13. In May 2018, a filmmaker was crushed to death in this country's capital after protestors toppled one of its "Tree of Life" sculptures. For 10 points each:

[10] Name this Central American country that has been rocked by civil unrest due to the unpopular social security reforms of the Sandinista party.

ANSWER: **Nicaragua**

[10] The "Tree of Life" sculptures were installed by Rosario Murillo, the wife of this current president of Nicaragua. During an earlier term, this man led a civil war against the Contras before losing an election to Violeta Chamorro.

ANSWER: Daniel **Ortega** [or José Daniel **Ortega** Saavedra]

[10] Members of this organization were wounded by Ortega's government in an attack on a basilica in Diaramba. Violence against this organization prompted its leader, Pope Francis, to send Ortega a letter calling for "fraternal reconciliation."

ANSWER: the Roman **Catholic** Church [prompt on church; prompt on clergy or priesthood] <JA>

14. As a result of an outbreak of this disease, cabinet meetings were temporarily held in the city of Germantown. For 10 points each:

[10] Name this disease, whose 1793 outbreak in the nation's capital also led to the rise of future Surgeon General Benjamin Rush. Another outbreak of this disease impeded construction on the Panama Canal.

ANSWER: **yellow fever**

[10] This city's mayor, Matthew Clarkson, called on its College of Physicians to deal with the 1793 yellow fever outbreak. This city lost its position as the nation's capital in 1800 to Washington, D.C.

ANSWER: **Philadelphia** [or **Philly**]

[10] Richard Allen, who helped Rush during the yellow fever epidemic, founded an Episcopal Church of this religious denomination in 1794. George Whitefield spread this denomination, which was founded by John Wesley.

ANSWER: **Methodism** [or members of the **Methodist** church; or the African **Methodist** Episcopal Church; or the **AME** Church; or **Methodist** Episcopal; or Wesleyan **Methodism**; prompt on Christianity; prompt on Protestantism] <AN>

15. Zaha Hadid, an Iraqi-born woman who had this profession, won the Stirling Prize in 2010 and 2011. For 10 points each:

[10] Name this profession held by Hadid that allowed her to become the first woman to win the Pritzker Prize.

ANSWER: **architect**

[10] One of Hadid's last projects before her death was designing Al-Wakrah Stadium, a venue for this 2022 event set to be held in Qatar. The 2018 version of this sporting event was held in Russia.

ANSWER: FIFA **World Cup**

[10] The facade of Zaha Hadid's Generali Tower changes orientation as the tower rises, a technique pioneered by this architect in his Turning Torso. This Spanish architect also designed the Milwaukee Art Museum.

ANSWER: Santiago **Calatrava** [or Santiago **Calatrava** Valls] <JA>

16. The hero Karna is rather complex in his morals and the ethics of his actions. For 10 points each:

[10] Karna was a major character in the *Mahabharata*, an ancient Indian epic that depicts one of these events between the Pandavas and the Kauravas at Kurukshetra.

ANSWER: **wars** [or **battles**]

[10] Though he was of royal heritage, Karna was often insulted because he was thought to be the son of one of these people. In addition to being an advisor, Krishna played this role for Arjuna rather than directly fighting in the war.

ANSWER: **charioteer** [accept reasonable equivalents]

[10] Because of his apparent low birth, Drona refused to teach Karna this skill. He ends up lying he's a Brahmin and learns this skill from Drona's master Parasurama.

ANSWER: **archery** [prompt on vague answers like warfare or combat] <DM>

17. An incident involving this food in a poem was inspired by a real life incident involving Carl Solomon. For 10 points each:

[10] Name this food, which is thrown at “CCNY lecturers on Dadaism” in a 1956 poem.

ANSWER: **potato salad**

[10] Carl Solomon was the dedicatee of this poem, which the potato salad incident occurs in. It begins, “I saw the best minds of my generation destroyed by madness.”

ANSWER: “**Howl**” [accept “**Howl** for Carl Solomon”]

[10] Howl contains a line about the angels of this religion, which are seen “staggering on tenement roofs illuminated.” Due to the anger in this religion over Salman Rushdie’s *The Satanic Verses*, Ayatollah Khomeini issued a fatwa.

ANSWER: **Islam** [accept **Muslims**; or al-**Islam**] <GC>

18. One side during this conflict was led by the Duke of Guise, while another was led by the final Valois monarch of France. For 10 points each:

[10] Name this French war of religion, which ended with a Huguenot being crowned King of France and converting to Catholicism.

ANSWER: War of the **Three Henrys** [prompt on French Wars of Religion]

[10] Henry IV of France issued this document which granted religious freedom to Huguenots. It would later be revoked by the Edict of Fontainebleau by Louis XIV.

ANSWER: Edict of **Nantes**

[10] At the end of the War of the Three Henrys, Henry IV converted to Catholicism after proclaiming that this capital of France “is well worth a mass.”

ANSWER: **Paris**, France <AN>

19. This quantity can be calculated by taking the limit of the average energy of an oscillator (“OS-uh-ley-ter”) as temperature decreases to zero. For 10 points each:

[10] Name this quantity, the lowest possible energy a quantum system can have.

ANSWER: **zero point** energy [accept **ground state** energy]

[10] The zero point energy of a quantum system can be derived by minimizing total energy with respect to delta x. That delta x term is introduced by using this principle, which also includes a delta p term for momentum.

ANSWER: **Heisenberg uncertainty** principle [accept either underlined answer]

[10] The uncertainty principle is also used to show that energy and this quantity do not commute. This quantity is measured in seconds.

ANSWER: **time** <AG>

20. Answer the following about dinosaur discoveries made in the Hell Creek formation, which spans Montana and the Dakotas, for 10 points each:

[10] The Hell Creek formation contains many fossils of these extinct mollusks with spiral shells. They are often used as index fossils, meaning their discovery can mark different time periods.

ANSWER: **ammonites**

[10] Lots of these reptiles have fossils in Hell Creek. The “map” and “Eastern box” species of these reptiles are commonly kept as pets.

ANSWER: **turtles**

[10] Dinosaurs found at Hell Creek include members of this genus, whose name translates to “three-horned face.”

ANSWER: **Triceratops** <JA>