## early autumn collegiate novice tournament

matt jackson | bryan berend | dallin kelson | ethan hewett | gaurav kandlikar | neil fitzgerald | tony leng | matt hart huma zafar | brice russ | charlie rosenthal | sandy huang | idrees kahloon | tanay kothari | andrew hart

## packet 2 tossups

1. These particles were fired at nickel during the Davisson-Germer experiment. They interact with each other during hyperconjugation. Feynman diagrams use a solid arrow pointing towards an interaction vertex to represent this particle, which is emitted with a corresponding antineutrino in beta-minus decay. This particle's charge is negative 1.602 times ten to the negative nineteenth coulombs, a value approached within one percent in Millikan's oil-drop experiment. For 10 points, name these negatively charged subatomic particles.
ANSWER: electrons
2. In one of this author's novels, seventeen half-brothers with the same first name are marked for death by permanent Ash Wednesday crosses. He wrote about Dr. Urbino's death while trying to capture a parrot in a novel that ends with Florentino Ariza and Fermina Daza sailing down a river while flying a yellow flag. This author of Love in the Time of Cholera created Remedios, Aurileano, and other descendents of Ursula and Jose Arcadio Buendia in a novel set in Macondo. For 10 points, name this magical realist author who wrote One Hundred Years of Solitude.
ANSWER: Gabriel García Márquez [prompt on partial answer]
3. This architect used reinforced concrete as the primary material for his Unity Temple in Oak Park. He used oya stone in an Aztec-inspired design that survived a magnitude 8.3 earthquake. He emphasized horizontal lines and overhanging eaves in his Robie House. This architect of the Imperial Hotel in Tokyo created a helical spiral for the New York Guggenheim Museum. This architect also designed the home of Edgar Kaufmann over a running creek. For 10 points, name this architect who established the Prairie Style and designed Fallingwater.
ANSWER: Frank Lloyd Wright
4. The grandson of this dynasty's founder was overthrown in a coup by his uncle, the Prince of Yan. This dynasty's last emperor, Chongzhen, was dethroned by the peasant Li Zicheng. Its first emperor came to power during the Red Turban Rebellion and was known as Zhu Yuanzhang, the Hongwu Emperor. One of its rulers, the Yong-le emperor, sent Zheng He on exploratory naval missions, commissioned the Forbidden City, and moved the capital to Beijing. For 10 points, name this Chinese dynasty that succeeded the Yuan and preceded the Qing, known for its porcelain. ANSWER: Ming dynasty [or Da Ming Chao; or Empire of the Great Ming]
5. This thinker championed the idea of "eternal return," that everything has already happened and will happen again. He claimed that it is foolish to call a predator amoral simply because it is a predator in his discussion of the "Blond Beast," which appears in a work in which he contrasts moralities based on consequences and intentions. This formulator of the "master/slave morality" proposed the übermensch and declared that "God is dead." For 10 points, name this German philosopher who wrote The Gay Science, Beyond Good and Evil, and Thus Spoke Zarathustra. ANSWER: Friedrich Wilhelm Nietzsche
6. This molecule's biosynthesis requires the removal of the c-peptide. Its namesake "growth factors" are located in the p 13 and p 15 subsections of chromosome 11 . In the body, the concentration of this hormone oscillates with a period of three to six minutes before returning to base levels. Glucagon counteracts the effects of this hormone, the lack of which causes hyperglycemia. It is produced by the beta cells of the islets of Langerhans in the pancreas. For 10 points, name this mammalian hormone that regulates the levels of glucose in the body, which some diabetics must inject. ANSWER: insulin
7. A function that gives this quantity at a fixed level of utility is a "compensated" function. Changes in the curve that represents this quantity can be the result of the substitution and income effects. The Slutsky equation relates the Hicksian and Marshallian functions of this quantity. Giffen goods do not conform to the namesake law of this quantity. This quantity has a downward-sloping curve, and is defined as the willingness and ability to purchase a commodity or service. For 10 points, name this economic quantity, often paired with supply.
ANSWER: demand
8. In one song, this musician tells a boy to "zip your lips like a padlock." In another song, she tells the title "old man" that he needs a CAT scan. This singer of "Dinosaur" provided backing vocals for Flo Rida's "Right Round" and appeared in the music video for Katy Perry's "I Kissed a Girl." One song on her debut album Animal features Three-Oh-Three. In another song, she hits the clubs after brushing her teeth "with a bottle of Jack." For 10 points, name this "Baby Gaga," the artist of songs like "Your Love is My Drug," "Blah, Blah, Blah," and "Tik Tok."
ANSWER: Kesha [or KeSha; or Kesha Rose Sebert]
9. A value named for this man is proportional to the integral of Gaussian curvature over a closed surface. He is the namesake of an identity stating that "cosine theta plus sine theta times $i$ " equals "e to the $i$ times theta." His namesake "characteristic" equals vertices minus edges plus faces. The limit of the difference between the harmonic series and the natural $\log$ is named for Mascheroni and this solver of the Bridges of Konigsberg problem. A value of about 2.718, the base of the natural log, is named $e$ in his honor. For 10 points, name this Swiss mathematician.

ANSWER: Leonhard Euler
10. This man won the Civic Crown for his service under Thermus during the siege of Mytilene. He demanded that his captors ransom him for fifty instead of twenty talents while in the captivity of Cilician pirates. This man recounted his victory at the Battle of Alesia, where he defeated Ambiorix and Vercingetorix, in his Commentaries on the Gallic War. He won the Battle of Pharsalus against a former fellow member of First Triumvirate, Pompey. For 10 points, name this man who crossed the Rubicon and became dictator of Rome, later assassinated by Brutus.
ANSWER: Gaius Julius Caesar
11. The protagonist of this work visits the estate of Pemberley after ensuring that the owner is away. Lady Catherine warns its protagonist not to accept her nephew's wedding offer near the end of this novel, in which Charlotte Lucas marries Mr. Collins. One relationship in this novel is kindled at Bingley's ball at Netherfield. In this novel, Lydia runs away with the treacherous, lady-spoiling Wickham. For 10 points, name this novel that focuses on the Bennet sisters, and ends with the marriage of Elizabeth to Mr. Darcy, written by Jane Austen.
ANSWER: Pride and Prejudice
12. This man gave the Invocavit sermons and opposed the Peasant's War. The papal bull Exsurge Domine was issued against this man by Pope Leo X. He opposed Johann Tetzel before being compared to Jan Hus by Johann Eck. This man was intercepted by Frederick III and taken to Wartburg Castle during his return trip from a meeting at which Charles V called him a heretic, the Diet of Worms. For 10 points, name this monk who started the Protestant Reformation when he nailed Ninety-Five Theses to a church door in Wittenberg. ANSWER: Martin Luther
13. When these materials are modeled as "freely jointed" objects, they behave as rigid rods on the scale of the persistence length. Synthetic condensation, or "step growth," is one classification of these materials. "Addition" or "chaingrowth" varieties of these structures see no loss or gain of materials. Ziegler-Natta catalysts are useful in syntheses of these materials that use alkenes as a base unit. For 10 points, name these chemical molecules that are large chains of individual molecules, examples of which include polypropylene and polystyrene.
ANSWER: polymers [do not accept "monomers"]
14. One character in this novel is a pope's daughter who was forced to eat one of her own buttocks cheeks when taken prisoner by Muslims. Its title character is accompanied by the dour philosopher Martin, and encounters the city of El Dorado with Cacambo. It begins when the title character is thrown out of Baron Thunder-ten-Tronckh's castle for kissing Cunegonde. The title character claims that we must all tend our garden at the end of this novel, which is set in the "best of all possible worlds," according to Dr. Pangloss. For 10 points, name this novel by Voltaire.
ANSWER: Candide
15. This artist painted a work in which soldiers battle in the foreground as a large, black cloud menaces overhead, shrouding the sun and the mountains in the background. In addition to Hannibal and His Army Crossing the Alps, he created a work in which boats of onlookers stream through the Parliament Bridge to watch Westminster Palace burn. He painted a ship "tugged to her last berth to be broken up" in The Fighting Temeraire. For 10 points, name this British Romanticist who showed a train barreling across a bridge in his painting Rain, Steam, and Speed.
ANSWER: J.M.W. Turner [or Joseph Mallord William Turner]
16. This man said that farmers are "neither better nor worse than any other people" in a campaign speech. He claimed that his party was a "sectional party" in a speech at the Cooper Union that was instrumental in earning him the presidential nomination. He defeated John Breckenridge and John Bell in his first presidential election. He engaged in a series of 1858 debates with the man who advanced the Freeport Doctrine, Stephen Douglass. For 10 points, name this winner of the presidential election of 1860, who later issued the Emancipation Proclamation.
ANSWER: Abraham Lincoln
17. The songs "But who may abide" and "How beautiful are the feet" were changed after the premiere of this piece, which was debuted in London along with its composer's piece Samson. It was based on text prepared by Charles Jennens. It is split into three sections, which depict the Annunciation, the Passion, and the Aftermath. This work includes the aria "I know that my redeemer liveth" and a section that inspired King George II to stand, the "Hallelujah Chorus." For 10 points, name this oratorio composed in 1741 by George Frederic Handel. ANSWER: the Messiah [prompt on HWV 56]
18. In one of this author's novels, the protagonist is an eleven-year-old girl who is raped by her father, Cholly. This creator of Pecola Breedlove also wrote a work that details the family history of Milkman Dead the Third. In another novel by this author, Sethe (seth-ee) and Denver live at 124 Bluestone, a house that is haunted by the ghost of a two-year-old who was killed with a handsaw so that she would not have to live in slavery. This author wrote The Bluest Eye and Song of Solomon. For 10 points, name this female African-American author who wrote Beloved. ANSWER: Toni Morrison [or Chloe Ardelia Wofford]
19. This ruler was opposed by a Robert Aske-led movement whose red flag showed the stigmata, the Pilgrimage of Grace. This king's commander, Thomas Howard, defeated the Scots at Flodden Field. His meeting with Francis I at the Field of the Cloth of Gold was organized by his adviser, Cardinal Thomas Wolsey. He pushed for the first Act of Supremacy and established the Church of England after Clement VII refused to annul his marriage to Catherine of Aragon. For 10 points, name this Tudor father of Elizabeth I, an English king who beheaded two of his six wives. ANSWER: Henry VIII Tudor [prompt on Henry]
20. In one story, this god competes against fire in an eating contest that was rigged by a similarly named figure "of the Outyards." He takes the form of a mare in order to prevent the completion of a wall, which causes him to get pregnant and give birth to an eight-legged horse. He impersonates a giantess and refuses to weep for Balder's death, which he had previously caused by telling the blind god Hoder throw some mistletoe. By the giantess Angrboda, he fathered the giant serpent Jörmungand and the wolf Fenrir. For 10 points, name this Norse trickster god.
ANSWER: Loki

## tiebreakers

21. During this program's run, impure water with hydrogen bubbles caused one crew to suffer excessive flatulence. A failed plugs-out test led to this program's first catastrophic failure, which killed Ed White, Roger Chaffee, and Gus Grissom. Gene Kranz aborted one of this program's missions, in which an oxygen tank explosion nearly killed James Lovell and his crew. Another mission during this program saw the Eagle module land at Tranquility Base. For 10 points, name this series of U.S. space missions, the eleventh of which put men on the moon. ANSWER: Apollo program [accept Apollo 11 before "first Command Module"]
22. Relativistic effects cause a lateral adjustment in this phenomenon in its "transverse" type, which was confirmed experimentally by Ives and Stilwell. The classical formula describing this effect contains terms that represent the source and receiver velocities. This effect causes stellar objects to appear shifted towards the red or blue ends of the spectrum. For 10 points, name this effect in which waves coming from an object moving relative to an observer appear to change frequency, which is employed in weather radar.
ANSWER: Doppler effect

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## packet 2 bonuses

1. It shows the relationship between absolute magnitude and spectral type. For 10 points each:
[10] Name this graph that demonstrates stellar evolution. The main sequence is a band of stars on it.
ANSWER: Hertzsprung-Russell diagram [or H-R diagram; or HRD]
[10] One branch of the HR diagram consists of "giant" stars of this color, which are in the later phase of stellar evolution. Aldebaran, Arcturus, and Betelgeuse are all stars of this color.
ANSWER: red [or red giant; or red supergiant]
[10] At the end of a red giant's life, gases from the star can be expelled and then excited by the star's radiation, thus creating this type of emission nebula.
ANSWER: planetary nebula
2. In one work, this artist showed Peter inspecting a fish's mouth in the background. For 10 points each:
[10] Name the Renaissance artist who created The Tribute Money and executed an Expulsion for a building that he copainted with Masolino.
ANSWER: Masaccio [or Tommaso di Ser Giovanni di Simone Cassai]
[10] Masaccio's Holy Trinity contains at its center this scene, which Chagall depicted in white and Gauguin showed in yellow.
ANSWER: the Crucifixion [or Jesus on the Cross; or equivalents involving the cross and Christ]
[10] Masaccio's Tribute Money hangs in the Brancacci family's structure of this type. Giotto painted many frescoes in one named for the Arena.
ANSWER: chapel [or capella]
3. Because there isn't a Sixth Republic, name the following about the Fifth Republic of France, for 10 points each. [10] This general and former leader of the Free French dealt with Left Bank student protests in 1968 as the first President of the Fifth Republic.
ANSWER: Charles de Gaulle
[10] Charles de Gaulle led the Free French against this Nazi-collaborationist regime of occupied France, which was led by Philippe Pétain.
ANSWER: Vichy France
[10] The post-World War II Fourth Republic government gave way to the Fifth after a crisis in this former French colony, whose first independent president was Ahmed Ben Bella.
ANSWER: French Algeria
4. One thinker of this name, from Citium, founded a school that eschewed strong passions. For 10 points each: [10] Give this name, also shared by a philosopher from Elea who came up with famously vexing paradoxes. ANSWER: Zeno
[10] Zeno of Citium founded this school of philosophy, which emphasized calculated emotions. Emperor Marcus Aurelius authored this school's seminal tract, the Meditations.
ANSWER: Stoicism
[10] One of Zeno's paradoxes supposedly proves the impossibility of motion, and concerns whether one of these objects could possibly be in flight at any instant in time.
ANSWER: an arrow
5. This law states that internal energy equals heat minus work. For 10 points each:
[10] Name this law of thermodynamics, which states that energy can be transformed but never destroyed.
ANSWER: first law of thermodynamics
[10] The second law of thermodynamics states that this quantity, the disorder within a system, increases over time. ANSWER: entropy
[10] According to the third law of thermodynamics, perfect examples of these materials have an entropy of zero at absolute zero.
ANSWER: perfect crystals [or crystalline substances; or crystal lattices]
6. The so-called "Wethersfield Intercept" was discovered by the British while on its way to the Comte de Rochambeau during this battle. For 10 points each:
[10] Name this last battle of the American Revolution, after which the British surrendered to George Washington.
ANSWER: Battle of Yorktown [or Siege of Yorktown]
[10] The British forces at Yorktown were led by this general, who had earlier led the British forces at the Battle of Guilford Courthouse. He later served as a Governor General of India.
ANSWER: Lord Charles Cornwallis, 1st Marquess Cornwallis
[10] The Battle of Chesapeake, which preceded the Battle of Yorktown, saw the routing of the British by the Comte de Grasse, who led this wing of the French military.
ANSWER: French Navy
7. This man's characteristic works include Roses from the South and Tales from the Vienna Woods. For 10 points each: [10] Name this nineteenth-century Austrian composer from a prolific family, known as the "Waltz King." ANSWER: Johann Strauss, Jr. [or Johann Strauss II; do not accept answer of any other Strausses]
[10] One of Strauss's best-known waltzes is this one, which begins with the violins playing a tremolo and the horns playing the melody, which is meant to evoke impressions of the title river.
ANSWER: The Blue Danube Waltz [or On the Beautiful Blue Danube; or An der schönen blauen Donau]
[10] Strauss also composed this comic operetta, which sees Dr. Falke get revenge on Gabriel von Eisenstein for leaving him drunk and dressed as the title animal in the town square.
ANSWER: Die Fledermaus [or The Bat]
8. It causes dead leaves to be "driven like ghosts from an enchanter fleeing." For 10 points each:
[10] Name this phenomenon, which a poet asks to drive his "dead thoughts over the universe." The poem titled for this phenomenon asks: "If Winter comes, can Spring be far behind?"
ANSWER: the West Wind [prompt on wind; or "Ode to the West Wind"]
[10] This English Romantic poet who also wrote the sonnet "Ozymandias" wrote "Ode to the West Wind." ANSWER: Percy Bysshe Shelley
[10] In a P.B. Shelley play that describes him as "Unbound," this character is reunited with Asia. Earlier, Jupiter's eagle gnawed at this character's heart while he was chained to a mountain.
ANSWER: Prometheus [or Prometheus Unbound]
9. This city is home to such destinations as The Experience Music Project and Pike Place Market. For 10 points each: [10] Name this city where you can find the original Starbucks and the Space Needle.
ANSWER: Seattle, Washington
[10] Seattle is located between Lake Washington and this body of water, an inlet of the Pacific Ocean that is elsewhere spanned by the Tacoma Narrows Bridge.
ANSWER: Puget Sound
[10] Seattle is not located on the Pacific tectonic plate, but rather on this tectonic plate. It's the world's smallest plate, and is named for a Spanish explorer.
ANSWER: Juan de Fuca plate
10. This organelle is used to package macromolecules such as lipids and proteins for transportation throughout the cell.

For 10 points each:
[10] Name this eukaryotic organelle that was discovered by and named for an Italian physician.
ANSWER: Golgi apparatus [accept synonyms for "apparatus" like "body" or "complex"]
[10] Membrane-bound vesicles are shuttled between the Golgi apparatus and this organelle, which comes in rough and smooth forms.
ANSWER: endoplasmic reticulum [or ER]
[10] Enzymes are sent to this organelle using a mannose-6-phosphate tag. This organelle uses those enzymes to break down old or abnormal cell parts.
ANSWER: Iysosomes
11. This tsar reformed the Russian bureaucracy by taking power from the boyars and creating the merit-based Table of Ranks. For 10 points each:
[10] Name this "Great" tsar whose Beard Tax was one part of his attempt to westernize and modernize Russia.
ANSWER: Peter the Great; [or Peter I; or Pyotr Alexeyevich Romanov]
[10] Peter the Great was one of the victors in this war, which included the battles of Narva and Poltava.
ANSWER: Great Northern War [or Second Northern War; prompt on Northern War]
[10] The Great Northern War saw Russia defeat this other empire, which was ruled by Charles XII.
ANSWER: Kingdom of Sweden [or Swedish Empire]
12. For 10 points each, name these women from Greek mythology with whom Zeus fathered children.
[10] Zeus fathered Hephaestus with this jealous, cow-eyed wife of his.

## ANSWER: Hera

[10] Zeus seduced this woman, the wife of the Spartan king Tyndareus, in the form of a swan. Their union resulted in the birth of four children: Castor, Pollox, Clytemnestra, and Helen of Troy.
ANSWER: Leda
[10] Minos, Rhadamanthus, and Sarpedon are all sons of this Phoenician woman, who was carried off to Crete by Zeus in the form of a white bull.
ANSWER: Europa
13. It opens by discussing the myth of eternal return, and describes the relationship between Tomas, a womanizer, Tereza, and Sabina. For 10 points each:
[10] Name this novel, written by a Czech author.
ANSWER: The Unbearable Lightness of Being [or Nesnesitelná lehkost bytí]
[10] Name the Czech author of The Unbearable Lightness of Being and The Book of Laughter and Forgetting. ANSWER: Milan Kundera
[10] Tomas and Tereza own a dog named for this literary character, who throws herself in front of a train after her affair with Count Vronsky goes awry.
ANSWER: Anna Karenina [accept either underlined part; or Karenin (the name of the dog)]
14. Although all of the figures in this sculpture were leading men in their hometown, all of them are barefoot and wear only their undergarments. For 10 points each:
[10] Name this statue of six men who were willing to die for the title city during the One Hundred Years' War.
ANSWER: The Burghers of Calais [or Les Bourgeois de Calais]
[10] The Burghers of Calais was sculpted by this Frenchman, who also executed The Age of Bronze and created many works like Fugit Amor for his The Gates of Hell.
ANSWER: Auguste Rodin [or François-Auguste-René Rodin]
[10] Originally called The Poet, this statue by Rodin depicts a seated Dante with his chin resting on a clenched fist. ANSWER: The Thinker [or Le Penseur]
15. Negligence, nuisance, and defamation are all types of these wrongs. For 10 points each:
[10] Name this term, defined as any wrongful act that is grounds for a civil suit, such as libel.
ANSWER: tort
[10] One type of wrong that is not a tort is the breach of one of these documents, a legally binding agreement between two parties.

## ANSWER: contracts

[10] This type of law promotes or maintains market competition by limiting contracts that would create monopolies. Northern Securities v. U.S. is a landmark case in this field of law.
ANSWER: antitrust law [prompt on competition law]
16. This law states that the volume and pressure of a gas are inversely proportional in an otherwise constant environment.

For 10 points each:
[10] Identify this law from chemistry named for the English author of The Skeptical Chymist.
ANSWER: Boyle's law
[10] This gas law named for a French scientist states that volume and temperature follow a linear relationship. Combining it with Boyle's law yields the ideal gas law.
ANSWER: Charles' law [or Charles-Gay-Lussac law; do not accept "Gay-Lussac's law" by itself]
[10] This theory of gas motion assumes that the sizes of gas molecules are negligible in comparison to the distances between them, and that the molecules are in constant random motion.
ANSWER: kinetic theory of gases [or kinetic-molecular theory of gases]
17. This emperor was ransomed for a room full of gold, but the conquistadors executed him anyway. For 10 points each: [10] Name this son of Huayna Capac who defeated his brother Huascar in a civil war.

## ANSWER: Atahualpa [or Atabalipa]

[10] Atahualpa was the last independent ruler of this empire, which used colored strings called quipu to convey messages on their extensive road system.
ANSWER: the Incan Empire [or Incas; or Kingdom of Cuzco]
[10] This Spanish conquistador led the expedition that killed Atahualpa and brought down the Incan empire.
ANSWER: Francisco Pizarro
18. The protagonist of this work takes up residence with Mrs. Lethebe while in Johannesburg, where he travels to help his sister Gertrude. For 10 points each:
[10] Name this South African novel in which Stephen's son Absalom is accused of the murder of Arthur Jarvis.
ANSWER: Cry, the Beloved Country
[10] This South African author of Cry, the Beloved Country also wrote about the van Vlaanderen family in Too Late the Phalarope.
ANSWER: Alan Paton
[10] The central figures of Cry, the Beloved Country, Stephen and the murderous Absalom, belong to this family. ANSWER: Kumalo family [or Kumalos]
19. This author's seminal volume contains the sections Drum-Taps, Children of Adam, and Calamus. For 10 points each: [10] Name this nineteenth-century American poet who published many editions of the collection Leaves of Grass. ANSWER: Walter "Walt" Whitman
[10] This long poem from Leaves of Grass is split into fifty-two sections. Whitman sounds his "barbaric yawp" in this poem, which begins with Whitman singing and celebrating.
ANSWER: Song of Myself
[10] This Whitman poem begins "flood-tide below me! I watch you face to face." It describes a boat ride across New York Harbor, during which Whitman reflects on the connection between himself and his future readers.
ANSWER: "Crossing Brooklyn Ferry"
20. The fifth of these tenets is sawm, which requires fasting during the month of Ramadan. For 10 points each: [10] Name these core duties of Muslims, which also include shahada and zakat.
ANSWER: Five Pillars of Islam
[10] This pillar of Islam requires every Muslim to make a pilgrimage to Mecca once in their lifetime.
ANSWER: haji
[10] Fajr, Duhr, Asr, Maghrib and Isha are the five prayers recited daily while facing Mecca as part of this pillar of Islam.
ANSWER: salat [or salah; or salawat]

## extra bonus

21. In one appearance, this character is fascinated by Master Pedro's puppet show, which he destroys when he fears that the characters within are being attacked by monsters. For 10 points each:
[10] Name this character who slaughters innocent sheep and tilts and windmills while attempting to glorify Dulcinea's name through knight-errantry alongside his squire, Sancho Panza.
ANSWER: Don Quixote de la Mancha [or Alonso Quijano; or Quesada; or Quijada]
[10] Don Quixote is a novel by this Spanish Golden Age author.
ANSWER: Miguel de Cervantes Saavedra
[10] Don Quixote rides this emaciated horse, which he imagines to be a great steed. At least this horse is more respectable than Sancho Panza's mount, a donkey named Dapple.
ANSWER: Rocinante
