

Michigan Fall Tournament (Written by Will Nediger, Kurtis Droge, Cody Voight, Saul Hankin, Ben Forster, Siddhant Dogra, and Peter Jiang)

### Editors Round 3

#### Warm-Up Tossup (Optional)

In one prequel, Genesis Rhapsodos begins to degrade after he fights this character. In one film, Kadaj uses the contents of a box he stole from Rufus to transform into this character. Lucrecia Crescent has terrible visions while she is pregnant with this man, though he later goes awry when he learns the truth about a different “mother.” This son of Hojo uses black materia to wreak havoc on Midgard before he is felled by Omnislash. With his left hand, this ex-SOLDIER wields the six-foot long Masamune. In one scene, this man iconically falls from the ceiling to impale Aerith Gainsborough. For 10 points, who is this silver-haired, one-winged antagonist of Final Fantasy 7?

ANSWER: Sephiroth

#### Tossups

**1. The current for these devices can be found as the saturation current times the quantity exponential of voltage over thermal voltage minus one, which is an equation named for William Shockley. Analysis of these devices typically uses the depletion approximation. The operating point of these devices can be graphically determined by overlaying a load line on their I-V characteristic, which features only one curve. A bridge of these devices can be used to implement a full-wave rectifier. A type of these devices intended to work beyond the breakdown voltage is named for Clarence Zener and they are typically operated in either reverse-bias or forward-bias mode. For 10 points, identify these circuit devices that maintain a constant voltage drop, ideally 0.7 volts, when its threshold voltage is exceeded.**

ANSWER: diodes [or pn junctions; or Zener diodes]

**2. This country was home to a xenophobic group called the Black Hundreds. During a protracted siege, this country lost control of the Orphan Hills, the 174-Meter Hill, and the 203-Meter Hill. The July Days took place in this country after the Kadets, or members of the Constitutional Democratic Party, resigned from the government. Demonstrators in this country led by Father Gapon were fired upon while trying to reach a palace, an event which became known as Bloody Sunday. This country lost the Battle of Mukden, the Battle of Port Arthur and the naval Battle of Tsushima as part of its war with Japan. Its 1906 constitution followed the issuance of the October Manifesto by Nicholas II. For 10 points, name this empire which was shaken by a 1905 revolution, and overthrown in a 1917 revolution which ended the tsarist period.**

ANSWER: Russian Empire

**3. In the *Skaldskaparmal*, it is said this goddess has a grandfather rich in gold named Olvaldi. Loki ties his scrotum to a nanny goat's beard in order to make this goddess laugh, and she later places a dripping serpent above him. This goddess's father kidnapped Idunn in the form of an eagle, after which he was burned and killed by the Aesir. As part of her wergild, this goddess married a god that had two children with his sister; those three are the most notable Vanir gods. Whenever she had to stay at watery Noatun, she always longed for Thiassi's mountain hall. This jotunn is the stepmother of Frey and Freya, because although she wanted to marry Baldr, she unwittingly chose Njord instead because of his clean feet. For 10 points, name this Norse goddess of winter.**

ANSWER: Skadi

**4. One of the most popular contemporary compositions for this instrument is “Stranger on the Shore.” Stravinsky’s *Ebony Concerto* was composed in order to showcase one player of this instrument, modern players of which include Acker Bilk and Pete Fountain. In addition to playing the saxophone, Lester Young also played this instrument. Cole Porter’s song “Begin the Beguine” became popular thanks to a 1938 recording by a player of this instrument, Artie Shaw. Woody Herman inspired the stage name of one player of this instrument. Another player of this instrument became the first jazz bandleader to play at Carnegie Hall in 1938 and was known as the “King of Swing.” For 10 points, name this instrument played by Woody Allen and Benny Goodman.**

ANSWER: clarinet

**5. It’s not Cuba, but one poem from this country repeatedly declares “My land has palm trees where the thrush sings” and is called “Exile Song.” A novella from this country is about an obsessive psychiatrist named Dr. Bacamarte, and was written by the same author who created a character who dies of pneumonia after inventing a revolutionary poultice. That author of *The Alienist* also wrote about a jealous husband who thinks his wife Capitu cheated on him. Another novelist from this country wrote about a cook from Ilheus named Nacib Saad in one novel. This country is home to the author of *Posthumous Memoirs of Bras Cubas* and *Dom Casmurro*, as well as the author of *Gabriela, Clove and Cinnamon*. For 10 points, name this home country of Antonio Goncalves Dias, Joaquim Maria Machado de Assis and Jorge Amado.**

ANSWER: Brazil

**6. The development and function of one subtype of these cells is controlled by the transcription factor FOXP3. Although not CD79, one cluster of differentiation in these cells contains the ITAM motif; phosphorylation of that motif by Lck allows ZAP70 to bind to their zeta chain. Although not natural killer cells, another subtype of these cells releases granzymes and perforin. These cells are distinguished from ones similar in function based on the presence of a namesake receptor, which recognizes antigens bound to MHC molecules. Their subtypes are distinguished by whether they express CD4 or CD8, which identify the helper and cytotoxic types. For 10 points, name these lymphocytes that mature in the thymus, as contrasted with similar cells that mature in the bone marrow, B cells.**

ANSWER: T cells [or T lymphocytes; prompt on lymphocytes]

**7. One concept introduced in this book has been applied to political philosophy by Nikolas Kompridis, who has written about a “reflective” type of that concept. This book argues that the world should be characterized as a “totality of involvements.” This book describes one of its aims as the destruction of traditional ontology, in order to replace ontical inquiry with fundamental ontology. This book uses the example of someone reaching for a hammer to illustrate the idea that we experience some things as being “ready-to-hand.” Much of this book focuses on the human experience of being, which the author calls *Dasein*. For 10 points, name this magnum opus of Martin Heidegger.**

ANSWER: Being and Time [or Sein und Zeit]

**8. One poem set during this war describes a field “where April rain / Solaced the parched ones stretched in pain” and proclaims “What like a bullet can undecieve!” This war is the setting of a story in which a deaf, mute child plays amidst a fire that he does not realize is his own burning house. Ira Claffey is prevented from bringing vegetables to a group of prisoners by John Winder in a novel set in a prison camp from this war by MacKinlay Kantor. In one story, Peyton Farquhar imagines himself escaping a hangman’s noose during this war. The setting of Ambrose Bierce’s “An Occurrence at Owl Creek Bridge,” characters in a novel set during this war include The Loud Soldier, Wilson, and The Tall Soldier, Jim Conklin. For 10 points, name this war in which Henry Fleming fights in *The Red Badge of Courage*.**

ANSWER: American Civil War [accept “Shiloh” during the first sentence]

**9. This king ordered the Welshman Rhys ap Rhydderch to be executed for joining a Viking raid of England. Like Henry I, this king has a 12th-century collection of laws named after him, even though he did not make any significant changes to the law. A controversy erupted over his appointment of Robert of Jumieges as Archbishop of Canterbury. He was supported by Leofric and Siward in his conflict with Earl Godwin. His mother favored Magnus the Good over him, and in return he confiscated her property; that mother, Emma of Normandy, was also the mother of this king's predecessor, Harthacnut. He began the construction of Westminster Abbey, and he is the only English king to have been canonized. For 10 points, name this penultimate Anglo-Saxon king of England, famous for his piety.**

ANSWER: Edward the Confessor

**10. St. Jerome and St. Christopher appear in a painting of this scene by Pintoricchio. A painting of this scene by James Tissot is notable for its unusual perspective. Miguel de Unamuno wrote a poem about Velazquez's version of this scene, which has a stark black background. In one painting of this scene, a man in green with a bag over his shoulder runs toward a burning scroll in the bottom right. This scene is paired with the Last Judgment in a diptych by Jan van Eyck. Dali used the net of a tesseract as the central object of this scene in his *Corpus Hypercubus*. The upper part of Masaccio's *Holy Trinity* is a depiction of this scene. Raphael's version of this scene is named after Ludwig Mond, and Chagall painted a "white" version. For 10 points, name this scene showing Christ on the cross.**

ANSWER: Crucifixion

**11. A derivative of these functional groups that contains a halogen, such as sebacyl chloride, is reacted with hexamethylene diamine to create nylon. Treatment of this functional group with bromine and phosphorus trichloride alpha-brominates them in the Hell-Volhard-Zelinsky reaction. After the dianion attacks the aldehyde in the Cannizzaro reaction, it is converted to the anion of this functional group. Chromic acid oxidizes primary alcohols to them as part of the Jones reagent. Acyl hypohalites, which are easily converted to alkyl halides, are commonly formed by reacting the silver salt of these functional groups with a halogen. An acid-catalyzed reaction between this functional group and an alcohol yields an ester in a reaction named for Emil Fischer. For 10 points, name this functional group that is a combination of a carbonyl and hydroxyl group and is named for its ability to protonate moieties.**

ANSWER: carboxylic acids [prompt on acids]

**12. This author's first major success on the stage contains a puppet play called *The Pleasures of the Town*, written by Harry Luckless. As the editor of the *Covent-Garden Journal*, this author of *The Author's Farce* started the so-called "Paper War" by attacking John Hill. The title character of one of his novels injures her nose in a carriage accident and is married to William Booth. He wrote a novel whose title character resists the sexual advances of Lady Booby, much like Mr. B is resisted by the title character of Richardson's *Pamela*. In his best known novel, the protagonist's love for Sophia Western is opposed by Squire Allworthy, who takes him in as a foundling. For 10 points, name this author who parodied *Pamela* in *Shamela* and *Joseph Andrews* and wrote *Amelia* and the picaresque novel *Tom Jones*.**

ANSWER: Henry Fielding

**13. A type of exocentric possessive compound in this language has a name which literally means "much rice." Like Greek, this language undergoes a process in which aspiration is lost on a consonant if the next syllable also contains an aspirated consonant, known as Grassmann's law. This language is the source of the general term for phonological processes that occur across word boundaries, sandhi. Sir William Jones claimed that this language was related to Greek and Latin, inaugurating the field of Indo-European studies. 3,959 rules of this language's morphology were recorded by its greatest grammarian, Panini. Though rarely spoken as a vernacular, it**

is still used as a liturgical language in Hinduism. For 10 points, name this Indo-Aryan language used to write the Vedas.

ANSWER: Sanskrit

**14. Temperance Flowerdew was twice married to governors who controlled this city, including George Yeardley. This city was governed for seven years by Dale's Code. Two residents of this city, William Tucker and John Potts, poisoned the alcohol of some natives during peace negotiations. This city was saved by Richard Pace and his servant, Chanco, after they warned its inhabitants of an invading force. The so-called "Third Supply" was a mission to this city during which the *Sea Venture* was lost in a storm. This city welcomed the arrival of Lord De La Warr with supplies at the end of a brutal winter called the Starving Time, and it was founded by an expedition headed by Christopher Newport's *Susan Constant*. William Berkeley abandoned this city during Bacon's Rebellion. For 10 points, name this city that served as the capital of the Virginia Colony for most of the 1600s.**

ANSWER: Jamestown

**15. A tapestry depicting the history of this sect was conceived by Anne Wynn-Wilson. Members of this sect can request a clearness committee if they seek solutions to their concerns or problems. An early group of leaders of this sect was known as the Valiant Sixty, and included people like James Nayler and Margaret Fell. It is considered one of the peace churches because of its practice of peace testimony. Many regional groups within this sect issue Books of Discipline and are named for the Yearly Meetings which they organize. The founder of this sect advocated "plain speaking," including the use of the pronoun "thee." They believe that God is present in each person in the form of the inner light. For 10 points, name this sect founded by George Fox, officially known as the Society of Friends.**

ANSWER: Quakers [accept the Religious Society of Friends before mentioned]

**16. A governess in this play laments that she has no one to talk to while reminiscing about her life as a performer before the death of her parents. The statement that "we must work" or else fall into the intellectual trap of seeking after nothing is made by a longtime student in this play. This drama includes a woman who returns from several years of living in Paris to the estate where her son had drowned. At its conclusion, the servant Firs is left forgotten in a shut up house, and he accepts his death as fate. In this play, Trofimov is referred to as the "Eternal Student" by a man who refuses to propose to Varya. Meanwhile, Lopakhin takes advantage of a debt auction to buy the childhood home of Madame Ranevskaya. For 10 points, name this play by Anton Chekhov that ends with the sound of axes cutting down the title plot of land.**

ANSWER: The Cherry Orchard

**17. Flooding in this region in late 2010 occurred along the Burnett and Fitzroy Rivers and destroyed parts of its city of Toowoomba. The majority of the Great Artesian Basin is located in this region, where the Glass House Mountains can be found in the urban area of the Sunshine Coast. This region's capital, containing Story Bridge, lies to the west of Moreton Bay and to the east of the Darling Downs. Off the coast of this region is an island once called the Great Sandy Island but now called Fraser Island. The northernmost parts of this region are comprised of Cape York Peninsula, to the west of which is the Gulf of Carpentaria, and the Great Barrier Reef is found off of its shores. Brisbane is the capital of this region, which lies north of New South Wales and east of the Northern Territory. For 10 points, name this Australian state named in honor of the monarch Victoria.**

ANSWER: Queensland

**18. The second movement of one of these works by this composer begins and ends with a second inversion A minor chord played by the winds. One of these works contains a second movement that is spuriously said to parody the sound of Johann Maelzel's metronome. One of these works was premiered alongside a work**

**written for a panharmonicon. Another of these works contains a second movement** funeral march in C minor and reused the theme from their composer's Opus 35, a set of solo piano variations. The seventh one was premiered alongside *Wellington's Victory*. One of these works features cadenzas by the flute, clarinet, and oboe to imitate bird calls in a movement called "On the Brook." The final one of these works is named "Choral" and sets text from Schiller's "Ode to Joy." For 10 points, name these four or five movement works including the *Eroica* and the *Pastoral*.

ANSWER: symphonies by Ludwig von Beethoven [prompt on partial answer]

**19. This scientist names the operator algebra that can be defined as a C-star algebra that admits a predual. This scientist first developed an axiomatic set theory that features classes and is a conservative extension of ZFC; that set theory is named with Paul Bernays and Kurt Gödel. This scientist introduced the density matrix formalism for quantum mechanics. The negative trace of the density matrix times the log of the density matrix is the quantum form of the** Shannon entropy and is named for him. With Stanley Ulam, he developed the first Monte Carlo method. This scientist developed merge sort and in his best known eponym, instructions and data are stored in the same memory. For 10 points, identify this Hungarian-American scientist who names a computer architecture.

ANSWER: John von Neumann

**20. The downfall of this empire is described in the middle sections of *The First New Chronicle and Good Government*. Jared Diamond argued that this empire was stymied by their inability to domesticate more than one animal, which they could not use for riding. This empire used a system of labor taxation called mita, while messengers used by this empire were called chasqui. One ruler of this empire was handed a Bible by Vicente de Valverde, but threw it to the ground, causing his capture in the Battle of Cajamarca. This empire used a record system called quipu that consisted of knotted ropes. One ruler of this empire attempted to buy his freedom by filling his jail cell once with gold and twice with silver; that man was Atahualpa. For 10 points, name this South American empire that included Cuzco and Machu Picchu and was conquered by Francisco Pizarro.**

ANSWER: Incas

**21. Dutch painter Hendrick Avercamp's favorite subject was people performing this action, and a painting by Henry Raeburn depicts a reverend named Robert Walker performing this action. A man doing this action carries a tray full of glasses in his left hand as he passes to the left of a wooden folding chair in an Alfred Eisenstadt photograph taken at the Grand Hotel in St. Moritz. William Grant is dressed in a black suit and hat while performing this action with crossed arms in the first major painting of Gilbert Stuart. The right background of Breughel's *Hunters in the Snow* shows a group of children doing this activity, which is the main subject of the Currier and Ives lithograph *Central Park, Winter*. For 10 points, name this activity which can be performed in the lower plaza of Rockefeller Center on a frozen rink.**

ANSWER: ice skating [accept word forms]

## Bonuses

1. The Stigler Committee noted an upward bias in many of these entities produced by the U.S. government due to a failure to account for the impact of trends in the quality of goods. For 10 points each:

[10] Name these economic constructs, one example of which averages the costs of various household goods and is known as the “consumer” one. They are often used to compute inflation rates.

ANSWER: price index

[10] The two most common price index formulas are the Paasche Index and this index, named after an economist who helped to legitimize business administration as a field of study.

ANSWER: Etienne Laspeyres

[10] The average of the Paasche and Laspeyres indices is named for Francis Edgeworth and this economist. He wrote a popular textbook in Britain, *Principles of Economics*, and names a type of demand that is not the Hicksian Demand.

ANSWER: Alfred Marshall

2. Many English authors dabbled in the art of letter writing. For 10 points each:

[10] Surely the most humorous and caustic letter writer was this correspondent of her sister, Cassandra. When not talking about having the hots for Tom Lefroy, she may have discussed her novels, such as *Sense and Sensibility*.

ANSWER: Jane Austen

[10] Oscar Wilde details the vanity and meaninglessness of his relationship with Alfred, Lord Douglas in this letter written from Reading Gaol. Its second section shows Wilde’s spiritual side and his opinions on Christianity.

ANSWER: De Profundis

[10] A letter by John Keats to his brothers introduced this two word phrase, which refers to the ability to think about the world without constraining it to always require complete rationality.

ANSWER: negative capabilities [accept word forms]

3. These composite organisms can be classified as crustose or filamentous based on their growth patterns. For 10 points each:

[10] Identify these organisms that consist of a fungus mycobiont and a photobiont, such as green algae or cyanobacteria, living in a symbiotic relationship.

ANSWER: lichens

[10] Some lichens are examples of this type of plant that grows non-parasitically on another plant, using it solely for physical support. These plants are an example of commensalism.

ANSWER: epiphytes

[10] The *Prochlorococcus* genus of cyanobacteria is the smallest known photosynthetic organism and contains divinyl derivatives of chlorophyll a and b, which both contain a porphyrin ring with this element at the center.

ANSWER: magnesium [or Mg]

4. The descent of this river to Earth is celebrated as the *avatarana*. For 10 points each:

[10] Name this river, which is considered the holiest in Hinduism.

ANSWER: the Ganges [accept Ganga]

[10] The Ganges is one of the four rivers visited in this pilgrimage which takes place every three years. In this pilgrimage, millions of people gather to bathe in a sacred river.

ANSWER: Kumbh Mela

[10] This city on the Ganges in Uttar Pradesh is the holiest of the Sapta Puri, or seven holy pilgrimage sites.

ANSWER: Varanasi [or Benares]

5. Answer the following about some limits in astronomy, for 10 points each:

[10] This limit predicts the maximum luminosity a stellar object can have given the outward radiation and inward gravitational forces.

ANSWER: **Eddington** limit [or **Eddington** luminosity]

[10] The Chandrasekhar limit gives the maximum stable mass of this type of star based on its electron degeneracy pressure.

ANSWER: **white dwarf**

[10] This limit gives the range within which a stellar object only held together by its own gravity will disintegrate from the tidal forces exerted by a second solar body.

ANSWER: **Roche** limit

6. Among the limited roles of the two kings of this city were deciding inheritance and adoption cases. For 10 points each:

[10] Name this city whose agriculture was largely dependent on its perioikoi and helot populations.

ANSWER: **Sparta**

[10] This Spartan king, a descendant of Eurysthenes, underwent the agoge system and fought at the Battle of Sepeia. He later led Greek forces at the Battle of Thermopylae, which saw the heroics of 300 Spartans.

ANSWER: **Leonidas I**

[10] The first Spartan king of this name was killed during Epaminondas's unconventional attack on the Spartan right wing in the Battle of Leuctra. The second king of this name reigned between the two stints of Leonidas II.

ANSWER: **Cleombrotus**

7. One of his orchestral works includes the movement "Play of the Waves." For 10 points each:

[10] Name this French composer of *La Mer*.

ANSWER: Achille-Claude **Debussy**

[10] Another orchestral work by Debussy, *Prelude to the Afternoon of a Faun*, begins with a solo from this instrument, which descends chromatically from C-sharp to G-natural.

ANSWER: **flute**

[10] Debussy's *Children's Corner* suite ends with this movement, which imitates minstrel music and makes heavy use of syncopated sixteenth notes. It also parodically quotes Wagner's *Tristan und Isolde*.

ANSWER: **"Golliwogg's Cakewalk"**

8. The Robinson-Patman and Celler-Kefauver Acts both amended a law of this type. For 10 points each:

[10] Name this type of legislation, examples of which include the Sherman and Clayton Acts. They sought to curb the power of large business conglomerates.

ANSWER: **antitrust** legislation [accept more specific answers]

[10] One of the first antitrust Supreme Court cases concerned E.C. Knight Company, which was involved in the production of this commodity. The Jones-Costigan Act governed its importation from the Caribbean.

ANSWER: **sugar**

[10] This railroad trust that combined the companies of E.H. Harriman and James Hill was targeted by Theodore Roosevelt and declared unconstitutional in a namesake 1904 Supreme Court case.

ANSWER: **Northern Securities** Company [accept **Northern Securities** *Company v. U.S.*]

9. Along with *The Crossing* and *Cities of the Plain*, it makes up its author's Border Trilogy. For 10 points each:

[10] Name this book which revolves around the travels and adventures of Lacey Rawlins and John Grady Cole, the latter of whom proposes to Alejandra, whose father betrays them to the authorities.

ANSWER: **All the Pretty Horses**

[10] Another work about horses is this 1973 play by Peter Shaffer is about Martin Dysart's attempts to cure Alan Strang of his obsession with horses.

ANSWER: Equus

[10] A book about Jody Tiflin's life in the west, *The Red Pony*, was written by this author who often used ranches in novels such as *Of Mice and Men* and *East of Eden*.

ANSWER: John Steinbeck

10. Murray Rothbard called one man of this tradition the world's first anarchist. For 10 points each:

[10] Name this philosophical tradition, which emphasizes *wu wei*, or non-action. It is largely based on a text written by Lao Tzu.

ANSWER: Taoism [accept Daoism]

[10] This Taoist philosopher described a dialogue with a skull, which asks him "How do you know it's bad to be dead?" after he expresses pity for its condition. Another of his dialogues is called "The Happiness of the Fish."

ANSWER: Zhuangzi [accept Zhuang Zhou; prompt on "Zhou"]

[10] Zhuangzi is probably best known for the solipsistic query of whether he is a man dreaming he is one of these animals or vice versa.

ANSWER: butterfly

11. For 10 points each, name the following about the Zhou Dynasty.

[10] The Zhou are often said to have employed a form of this system of governance, popular in medieval Europe, whereby lords commanded the military allegiance of vassals.

ANSWER: feudalism [accept word forms]

[10] The first period of the Eastern Zhou is sometimes referred to using the name of these two seasons. They also title a set of Annals describing the period that is one of the Five Classics of Chinese literature.

ANSWER: Spring and Autumn Period [accept in either order, but do not accept synonyms such as "fall"]

[10] The Spring and Autumn Annals is a chronicle of this Chinese feudal state, the birthplace of both Confucius and Mozi. Its capital was at Qufu, and it was ruled by a lord named Duke Huan.

ANSWER: Lu

12. The Morgan and Fleetwood families reside in the all black town of Ruby in this author's novel *Paradise*. For 10 points each:

[10] Name this author who told of Joe Trace's fatal shooting of his mistress, Dorcas, in her novel *Jazz*. In another of her works, the refusal of some marigolds to blossom is linked to the death of Pecola Breedlove's child.

ANSWER: Toni Morrison [or Chloe Ardelia Wofford]

[10] The title character of this novel, perhaps Morrison's best known work, haunts her mother Sethe's house at 124 Bluestone Road after having been killed by Sethe while on the run from Schoolteacher's slave catchers.

ANSWER: Beloved

[10] Another contemporary African-American author is Suzan Lori-Parks, who wrote this play about the brothers Lincoln and Booth. Booth, frustrated with his ineffectual relationship with Grace, kills Grace and Lincoln at its end.

ANSWER: Topdog/Underdog

13. One of this artist's last paintings is a swirly canvas called *Ocean Greyness*. For 10 points each:

[10] Name this American artist who used his technique of "drip painting" to create works like *Full Fathom Five* and *Number 5*.

ANSWER: Jackson Pollock

[10] This woman, Pollock's wife, was an artist in her own right. She painted series like *Eleven Ways to Use the Words to See* and *Little Images*.

ANSWER: Lee Krasner



[10] Pollock and Krasner both belonged to this American art movement, other prominent members of which are the sculptor David Smith and the painters Willem de Kooning and Arshile Gorky.

ANSWER: **abstract expressionism**

14. Gross and Pitaevskii derived a mean-field equation that describes this state of matter when it is spatially nonuniform and at absolute zero. For 10 points each:

[10] Name this state of matter formed when atoms are cooled near absolute zero, take on the properties of bosons, and occupy the same quantum state. It was first demonstrated with rubidium.

ANSWER: **BEC** [or **Bose-Einstein condensate**; prompt on **Bose gas**]

[10] This theorem, originally due to Wolfgang Pauli, gives between the phase change of a wavefunction for a particle turned 360 degrees and the phase change of a wavefunction when interchanging two particles of the same type. It explains why bosons obey Bose-Einstein statistics.

ANSWER: **spin-statistics** theorem

[10] A classic book on the spin-statistics theorem by Streater and Wightman also discusses the symmetry of these three physical quantities. One of these three symmetries is not normally seen macroscopically because of the second law of thermodynamics. Name any.

ANSWER: **charge** conjugation, **parity**, or **time** reversal symmetry [or **C**, **P**, or **T** symmetry]

15. For 10 points each, name some stuff about Renaissance Man Luca Pacioli:

[10] Pacioli is probably best remembered today for recording this system, used by Italian merchants at the time, whereby the financial transactions of a business are recorded as credits and as debits.

ANSWER: **double-entry** bookkeeping

[10] Pacioli taught mathematics to this man, a close friend of his. This lover of mirror writing illustrated Pacioli's *On the Divine Proportions* and himself employed a proportion scheme in his drawing of the *Vitruvian Man*.

ANSWER: Leonardo da **Vinci**

[10] Pacioli wrote a book sometimes called *The Boredom Dodger* about this activity. Practitioners of this activity include Jose Capablanca, Viswanathan Anand, and the fictional Aleksandr Luzhin.

ANSWER: playing **chess**

16. A fight scene in this musical directly follows the performance of the "Tonight Quintet." For 10 points each:

[10] Name this musical in which two lovers find themselves free from their troubles during the singing of "Somewhere," which is again sung by the female lead near its end after she finds her lover dead.

ANSWER: **West Side Story**

[10] This composer wrote the music for *West Side Story*. His symphonies have nicknames such as *Jeremiah*, *The Age of Anxiety*, and *Kaddish*.

ANSWER: Leonard **Bernstein**

[10] On the other hand, the choreography for *West Side Story* was executed by this man, who also worked on *On the Town* and *Fiddler on the Roof*.

ANSWER: Jerome **Robbins**

17. Give some aspects of a common lab procedure used in organic chemistry, for ten points each.

[10] The thin layer type of this procedure usually involves applying a drop of an unknown mixture on a piece of glass coated with silica and placing it into a container with a solvent in order to separate each colored component.

ANSWER: thin layer **chromatography** [or **TLC**]

[10] After the sample has been applied to the TLC plate, it and the solvent will travel up the plate via this gravity-defying ability. It occurs in thin tubes as a consequence of surface tension and adhesion.

ANSWER: **capillary action** [or **capillary motion**; or **wicking**]

[10] After the mixture has had the chance to travel all the way up the plate via capillary action, this factor gives the fraction of the sample in the mobile phase.

ANSWER: **retardation** factor [or **R<sub>f</sub>**; or **retention** factor; do not accept "k"]

18. The first known use of *terza rima* was in this work. For 10 points each:

[10] Name this three-part poem which chronicles Dante's spiritual journey through Hell, Purgatory, and Paradise.

ANSWER: *The **Divine Comedy*** [or *La **Divina Commedia***]

[10] Much like the three sections of Sergio de la Pava's novel *A Naked Singularity*, the three sections of *The Divine Comedy* all end with this plural word.

ANSWER: **stars** [or **stelle**]

[10] In the second circle of Hell, Dante encounters this woman and her lover Paolo, being buffeted about by wind. Hearing her story causes Dante to faint.

ANSWER: **Francesca** da Rimini

19. This figure was turned into a woman after he hit two copulating snakes, and according to one story, he was turned blind by Hera after he said women enjoyed sex more than men. For 10 points each:

[10] Name this most famous prophet from Greek mythology.

ANSWER: **Tiresias**

[10] Tiresias tells this king of Thebes to free Antigone and to allow the burial of her brother Polynices. This man calls Tiresias a traitor, but ultimately agrees.

ANSWER: **Creon**

[10] This other king of Thebes was advised by Tiresias to allow the worship of Dionysus. This figure refused, and ended up being torn up by the maenads, including his mother, Agave.

ANSWER: **Pentheus**

20. This werewolf operative spearheaded the Gran Sasso raid to rescue Mussolini. For 10 points each:

[10] Name this German who was ordered to assassinate Stalin, Churchill and FDR at the Tehran Conference.

ANSWER: Otto **Skorzeny**

[10] As part of Operation Knight's Leap, Skorzeny also attempted to incapacitate this leader of the Yugoslav Partisans.

ANSWER: Josip Broz **Tito**

[10] Skorzeny redeemed himself for failing to capture Tito by successfully kidnapping Miklos Horthy Jr. and forcing his father to cede power to the leader of the Arrow Cross Party in this country.

ANSWER: **Hungary**

21. For 10 points each, name some animals with magical powers in Japanese folklore.

[10] Inari is the kami of these animals, which often shapeshift to cause mischief and can have up to nine tails. In the Chinese classic *Fengshen Yanyi*, Daji is usually depicted as one of these animals.

ANSWER: **foxes** [accept **kitsune**]

[10] Like kitsune, these jolly creatures also shapeshift, but often with the help of leaves. In the tale "Bunbuku Chagama," one of these animals transforms himself into a teapot with legs and walks a tightrope to earn money for his rescuer.

ANSWER: **raccoon dogs** [accept **tanuki**; do not prompt on partial answers, as raccoon dogs are actual animals]

[10] In the most popular version of the story of Momotaro, an alien boy that comes to Earth in a giant peach befriends a dog, a pheasant and one of these animals. In Indian myth, Hanuman is one of these animals.

ANSWER: **monkeys**