Packet 16: Finals 2

Spartan Housewrite

Questions by: Members of Michigan State’s Academic Competition Club, Conor Thompson, NourEddine Hijazi, Eric Mukherjee, Joe Su, and Saul Hankin

Edited by: Jakob Myers, Evan Suttell, Eric Mukherjee, Harris Bunker, Conor Thompson, and Joe Su

Tossups:

1. **In one card game, playing an Alchemist lets you do this twice, while playing a Caravan lets you do this when you play it and at the beginning of your next turn. Other cards that let you do this action twice in that card game include Moat and Laboratory. In several games, including Dominion, cards which let you do this once when you play them are referred to as "cantrips." In *Magic: the Gathering*, the artifact Howling Mine causes all players to take this action an additional time per turn, and one of that game's so-called "Power Nine", (\*)** Ancestral Recall, causes you to do this action three times. In Uno, if a player cannot play, they must do this until they are able to make a legal play. In a variety of poker named for this action, players can discard any number of cards from their hand and then perform this action that many times. For 10 points, identify this action often taken in card games to increase one's hand size.
ANSWER: **draw**ing a card [accept drawing any arbitrary number of cards such as **drawing three cards**]

2. **In one novel, the narrator reflects how one of these objects leaves "no chance at all, absolutely none" and that it forces him into a "kind of moral collaboration"; he later reflects that it bothers him that it is at the "same level as the man approaching it". The argument that "Society itself does not believe in the exemplary value it talks about" is put forth in an essay titled for one of these objects which suggests banning the sale of alcohol to improve living conditions for the average citizen. That essay, collected in "Resistance, Rebellion, and Death" is titled for the (\*)** "Reflections on [one of *these objects*]". Meursault **("Mair-so")** reflects on his father throwing up before seeing one of these objects in *The Stranger*. Albert Camus argued against the use of the capital punishment by using the example of, for 10 points, what kind of object commonly used during the French Revolution?
ANSWER: **guillotine**

3. **One president during this war may have supplied weapons to a group that later assassinated him at a 1993 May Day parade. Fighting in this conflict's later stages centered around the military base of Elephant Pass, and an outbreak of ethnic violence during this conflict was nicknamed "Black July". One side in this conflict expelled a Muslim minority called the "Moors" from their territory. Ranasinghe (\*)** Premadasa was killed during this war, and Mahinda Rajapaksa's military leadership is often credited with ending this conflict. This conflict was fought between the government and a group that wanted to establish an ethnic homeland in the Jaffna region they called "Eelam." That group would eventually assassinate Indian Prime Minister Rajiv Gandhi. For 10 points, name this war fought between a Sinhalese-led government and the Tamil Tigers.
ANSWER: **Sri Lankan Civil War** [accept **First Eelam War**, **Second Eelam War**, or **Third Eelam War** until Eelam is mentioned]

4. **The problems of received opinion, truth and meaning are central to a solution raised by this thinker to the question of "relationship of significance to the living man." This thinker said the phallus is the signifier of castration and used the word "sexuation" over sexuality. This thinker's so-called "phallic function" does not submit objects that are characterized by the formula "bar for all *x* over bar there exists *x*." In another lecture, this thinker says the title object is the presence-absence that allows event to unfold and it itself a character. That lecture was on (\*)** Poe's "Purloined Letter." The significance of infants recognizing themselves is explained in one concept created by this thinker. For 10 points, name this difficult to understand French psychologist who wrote about the "mirror stage" in his *Ecrits*.
ANSWER: Jacques **Lacan**

5. **One version of this technique is analyzed using SpotMap. SPYRO Ruby and silver staining are common detection in this technique. This technique, alongside immunofixation, performed on urine and serum is used to diagnose MGUS ("em-guss") and multiple myeloma. TEMED and ammonium persulfate are used to create a polymer used in it. This technique is done twice, the first using a pH gradient to (\*)** separate by isoelectric point, in its two-dimensional variety. This assay is run before transferring substrates onto a PVDF membrane in western blotting. Beta-mercaptoethanol is used to boil and denature samples before loading them into wells in this technique. For 10 points, name this technique which uses a polyacrylamide matrix to separate proteins by size.
ANSWER: gel **electrophoresis** [or polyacrylamide gel **electrophoresis**, or PA**GE**, or protein gel **electrophoresis**; or protein **electrophoresis**; or serum **electrophoresis**; or urine **electrophoresis**; accept more specific answers like SDS-PA**GE**, native PA**GE**, QNPC-PA**GE**, 2D SDS-PA**GE**; or two-dimensional SDS-PA**GE**; do NOT accept "agarose gel electrophoresis", "DNA electrophoresis"]

6. **This composer marketed one set of string quartets to potential patrons as written in a "new and special" way. A quartet in that Opus 33 has a melody in its *Rondo - Presto* finale derived from a Slavonic folk tune, has the first violin enter in the first movement on sustained G's, and gets its nickname from the chirping grace-notes it uses throughout; that quartet, "The Bird," joins quartets such as (\*)** "The Joke" in this composer's "Russian" quartets. This composer wrote the melody that became "*Deutschland, Deutschland über alles*," and used it as a theme for variations in his "Emperor Quartet." He was the dedicatee of sets of string quartets by both Beethoven and Mozart. For 10 points, what "Father of the String Quartet" and "Father of the Symphony" composed the *Surprise Symphony*?
ANSWER: Franz Joseph "Papa" **Haydn**

7. **In 2018, this state's legislature passed a resolution claiming that its northern border was incorrectly surveyed and claiming land adjacent to a lake. Interstate 16 lies entirely within this state, which also contains an intersection between Interstates 75 and 85. A public transit system in one city in this state has been derided as a scheme for "Moving Africans Rapidly Through" that city. Major League Baseball's first commissioner was named for a (\*)** mountain in this state. A 2018 political candidate in this state called for a monument here to be destroyed by sandblasting. That monument, the world's largest bas-relief carving, depicts three Confederate leaders on horseback. This state's Springer Mountain is the southern terminus of the Appalachian Trail. For 10 points, name this state home to Stone Mountain, whose capital city is Atlanta.
ANSWER: **Georgia**

8. **The "double-conquest" theory identifies these people with the Avars. Because the seven tribes of these people formed a federation with three tribes of Kavars, their neighbors called them the "Ten Arrows." These people destroyed Great Moravia after being recruited by Arnulf. Byzantine emperor Leo VI paid them to attack the Bulgarians, who in turn paid the Pechenegs to attack these people. After the death of a "sacred king" of these people named Kurszán (koor-san), their offices of *kende* and *gyula* (joo-la) were united as a single monarchy. A subgroup of this people are known as (\*)** *székely* **(see-kay)**. Another king of these people was crowned on Christmas Day, 1000 by Pope Sylvester II. In 955, they were defeated by Otto the Great at the Battle of Lechfeld. These people crossed the Carpathian Mountains in 895 AD, invading the Pannonian Basin. Árpád and Saint Stephen ruled, for 10 points, what Finno-Ugric people who settled what is now Hungary?
ANSWER: **Magyar**s [or **magyarok**; accept **Hungarian**s before "Hungary"]

9. **The narrator of a poem pleads with this figure to "Take notice of the cause I plead" before this figure appoints Genius to hear the narrator's confession. That poem, whose last book includes a section entitled "Leave-taking of [this deity]," is entitled *Confessio Amantis* and was written by John Gower. This deity is compared to the brooch of Thebes in a poem titled for a complaint of this deity's lover. The narrator of another poem by that author finds himself reading *The Aeneid* in a (\*)** glass temple dedicated to this deity before being transported to the titular *House of Fame*. In the "Knight's Tale," Palamon prays to this deity before competing for love Emily. For 10 points, identify this deity who often appears in romantic medieval literature along with her son Cupid.
ANSWER: **Venus** [also accept **Aphrodite**]

10. **In complexes with this many d electrons, the spin multiplicity is either 2 or 6. Pi helices have hydrogen bonding between every this many amino acids. IBX contains an iodine atom with this valency. Corannulene and Benzo[a]pyrene contain this many benzene rings fused together. A cycloalkane with this many carbons adopts half-chair and envelope conformations. Complexes with this many ligands undergo a motion in which a single pivot ligand holds still and the others flip between axial and equatorial; that mechanism is the (\*)** Berry pseudorotation. Twelve rings containing this many carbons appear in buckminsterfullerene. Two ligands containing this many carbons appear sandwiched around iron in ferrocene. The alkane with this many carbons has a "neo-" isomer containing a quaternary carbon. Complexes with this many ligands adopt a trigonal bipyramidal geometry. For 10 points, give this number of carbons in pentane.
ANSWER: **five**

11. **A saint with this name had a dream in which he was told "Be strong, humble and robust. When the time comes, you will understand everything." and worked to support young men in Turin who were being exploited by bad contracts. In addition to that saint who John Paul II said practiced "Gospel Magic", the patron saint of priests had this name and built a shrine to St. Philomena while serving as the Cure of Ars. In addition to those saints of this name, Vianney and (\*)** Bosco, a vision of the Infant Jesus gave another saint of this name the epithet "of God." An Archbishop of Constantinople with this name is the namesake of the most widely used liturgy of the Byzantine Rite and wrote the Paschal Homily. For 10 points, identify this name of saints including Chrysostom and one who cared for the Virgin Mary, "the beloved Disciple" who wrote the last of the canonical Gospels.
ANSWER: **John** [accept specific saints including **John Bosco**, **John Vianney**, **John of God**, **John Chrysostom**, and **John the Evangelist**]

12. **One ruler of this dynasty retained a group of servants called the *chiggiyan* who would cook and eat dissidents against his rule. He wasn't Ivan the Terrible, but the English merchant Anthony Jenkinson produced an account of visiting this dynasty's royal court. This dynasty ceded land at the Treaty of Ganja, and this dynasty lost the Battle (\*)** of Chaldiran. This dynasty, along with its Western neighbor and its Eastern neighbor, is often considered as one of the three "gunpowder empires". This dynasty's first ruler came to power with the help of Turkic *qizilbash* tribesmen, many of whom were members of its namesake Sufi order. For 10 points, name this Persian dynasty that preceded the Qajar and whose rulers included Abbas the Great and Ismail.
ANSWER: **Safavid** Dynasty [prompt on Persia; accept **Safavi**]

13. **The protagonist of this story lies down on the couch due to the smell of jonquils and thinks of her "modern, thrilling friends." Earlier, that character blames "idiotic civilization" for the fact that she cannot express emotion without being "drunk and disorderly." In this story, a character cannot help but fall in love with "beautiful women who had something strange about them." A poet in this story agrees to write a play for the Norman Knights, and later remarks that the line "Why must it be the Tomato Soup?" is "*dreadfully* eternal." When a guest is leaving in this story, the protagonist believes that her (\*)** husband Harry's lips say "I adore you." At the end of this story, the main character cries "Oh, what is going to happen now?" when staring at a pear-tree, which she is compared to by Pearl Fulton. Bertha Mason loses the title feeling in, for 10 points, what story written by Katherine Mansfield?

ANSWER: "**Bliss**"

14. **One imaging technique that uses the induced version of this phenomenon was introduced by Conrad Schlumberger. He now names an array used in soundings which uses induced version of this phenomenon. This phenomenon can be described by arbitrary two dimensional vectors with terms A and B to the i delta named for Jones. Normalized such that I0 (I naught) is 1, a set of four parameters were constructed for four filters that exhibit half of the (\*)** intensity of light that exhibit this phenomenon; those parameters are named for Stokes. The square of the cosine of the angle between the analyzer axis and a namesake axis is proportional to the intensity of transmitted light according to Malus's Law. This property of transverse waves describes the orientation of their oscillation. For 10 points, what property can also be seen in a set of sunglasses that reduce glare?
ANSWER: **Polarization** [accept word forms like **Polarized**; also accept **Induced Polarization** or **Provoked Polarization**]

15. **In one work by this painter, two cherubs hold torches and ride lions that are pulling a chariot while Juno and Jupiter are united by Venus. A self-portrait by this artist features him sitting in a grove next to a woman in a purple dress in a tan hat. Another historical painting by this artist includes peacocks in the upper right looking down at the portrait of a woman being presented to a monarch, who later meets her after their marriage. This artist symbolized his fidelity to Isabella Brant through the setting of his work *The (\*)*** *Honeysuckle Bower*. The final three panels of a 24-painting commission by this artist are portraits of Francesco I and Johanna of Austria, parents of a monarch who is depicted next to a symbol of Concordia with Louis XIII. For 10 points, name this Flemish painter of the Marie de' Medici cycle.
ANSWER: Peter Paul **Rubens**

16. **In the introduction of this work, its authors tresses the importance of special knowledge by quoting Johann Hamann who himself alludes to the story about Tarquin and the garden of poppies. Another section on this work contains an oblique metaphor that compares the reader to a child being weaned off breast milk. The author of this work claims, because he must commit to communication and decision procedures, the aesthete chooses to be ethical in relation to a concept heavily discussed in this work. The author of this work, which contains the (\*)** "Exordium", also argues that the justification of human sacrifice may be in its communal benefit as seen through the example of Agamemnon and Iphigenia. The Knight of faith is mentioned in this philosophical work uses the example of Abraham's attempted sacrifice of Isaac to discuss the teleological suspension of the ethical. For 10 points, name this book that was published under the pseudonym Johannes de silentio but was actually written by Søren Kierkegaard.

ANSWER:***Fear and Trembling*** [or ***Frygt og Baeven***]

17. **One of these events in 1967 was prophesied by the black radical leader Ahmed to be a sign of a massive race riot in Cleveland and a war with China. A letter from William Henry Harrison asking Tenskwatawa to prove his prophethood via a miracle led Tenskwatawa to claim responsibility for producing one of these events, which his brother may have heard about from American scientists. Benjamin (\*)** Banneker's successful prediction of one of these events brought him to fame. Along with blood on an ear of corn, one of these events in February 1831 was interpreted by Nat Turner as a sign from god to revolt. For 10 points, name these events, one of which traversed the United States in August 2017 and could not be viewed without special glasses.
ANSWER: **solar eclipse** [prompt on eclipse; do NOT accept lunar eclipse]

18. **Led by Feryal Ozel, the Xtreme Astrophysics Group at the University of Arizona compiles information about the mass of these objects. 3C58 may be an example of a hypothetical subtype of these objects but those hypothetical objects may form via a unique supernova possibly exemplified by supernova 2006gy. One type of these objects is thought to be the same as a Soft (\*)** gamma repeater and have a magnetic field with flux density of up to one quadrillion gauss. The so-called "lasagna sheets" of these objects are formed by several spaghetti strands that are held together by extreme pressure. These objects, which include magnetars, are subject to an upper bound of three solar masses according to the Tolman–Oppenheimer–Volkoff limit. These objects are held together by its namesake particle's degeneracy pressure. For 10 points, identify this densest type of star that are almost entirely comprised of its namesake neutral subatomic particle.
ANSWER: **neutron** Star [anti-prompt on pulsar; accept magnetar before mention]

19. **The protagonist of one of this author's novels debates with Nick Meade about whether fascism is the root of evil after temporarily leaving his professorship at Columbia in order to join the Merchant Marines. Another of this author's characters, in an attempt to increase his sexual energy, puts himself into an "orgone" box. In that novel, the protagonist meets "the cutest little Mexican girl" while riding a bus. This author of (\*)** *The Sea is My Brother* and *Vanity of Duluoz* wrote a novel in which the protagonist picks cotton with Terry and Ricky in Sabinal before going to Paterson for Christmas. In that novel by him, the protagonist travels to Denver where he meets Carlo Marx who was inspired by Allen Ginsberg. Sal Paradise appears in, for 10 points, what author's novel, *On the Road*?
ANSWER: Jack **Kerouac**

20. **A filmmaker from this country directed himself as a gay man who loses his lottery winnings to a selfish son of an industrialist. That director was influenced by the melodramas of Douglas Sirk, who emigrated from this country to the United States. At the end of a film from this country, a man buys a book dedicated to him by a playwright he used to spy on; that film won the 2006 Academy Award for Best Foreign Film. A sometimes-documentarian from this country showed himself listening to the death tape of (\*)** Timothy Treadwell, but refused to play the audio, in *Grizzly Man*. That director also dramatized a Peruvian rubber baron's attempts to pull a steamship over a mountain in a collaboration with Klaus Kinski. For 10 points, identify this home of Rainer Werner Fassbinder and the director of *Fitzcarraldo*, Werner Herzog.

ANSWER: Federal Republic of **Germany** [or **Deutschland**]

Bonuses:

1. Answer the following about homosexuality in medieval India for 10 points each.
[10] In this memoir, a Mughal emperor discussed his attraction to one of his slaves as well as his love for *ma'joun* marijuana candy. This memoir describes how its author conquered much of India from his family's base in modern Uzbekistan.
ANSWER: ***Baburnama***
[10] The Hindu slave Khusrau Khan briefly took this title, succeeding his lover, Qutb-ud-Din. Another holder of this title, Ibrahim Lodi, was defeated at the First Battle of Panipat, and the holders of this title ruled from modern India's capital
ANSWER: **Sultan** of **Delhi**
[10] This "father of Urdu literature" had an ambiguously sexual relationship with his spiritual mentor, Nizamuddin. This author of a collection of five *masnavis* is considered an ancestor of the *qawwali* genre of music.
ANSWER: **Amir Khusro**

2. Swimming is a pervasive motif in the poetry of Walt Whitman. Answer some questions about it, for 10 points each:
[10] What's likely the most famous appearance of swimming and bathing in his poetry is in this poem, where the speaker sees "Twenty-eight young men bathe by the shore" and notes how the "splash of swimmers and divers cools the warm noon". Earlier the speaker comments how "I loafe and invite my soul."
ANSWER: "**Song of Myself**"
[10] In "I Sing the Body Electric", the speaker lists off things he enjoys doing with others including "Swim with the swimmers, wrestle with wrestlers" and "march in line with [members of *this profession*]", who "pause when the bell strikes suddenly again."
ANSWER: **fireman**
[10] In this other poem, the speaker asks the "ruffianly red-trickled waves" if they will kill the "gigantic swimmer", who is "swimming naked through the eddies of the sea".
ANSWER: "**The Sleepers**"

3. Measuring the release of the radioactive 51 isotype of this element from dying cells is a classic method of measuring cytotoxicity. For 10 points each:
[10] Name this transition metal which produces stainless steel when it is made into an alloy with iron.
ANSWER: **chromium** [or **Cr**]
[10] Chromium trioxide dissolved in sulfuric acid serves as an oxidizing agent in this reaction, which transforms primary alcohols to carboxylic acids and secondary alcohols to ketones.
ANSWER: **Jones** oxidation
[10] This catalyst contains chromium oxide supported on silica gel. Like Ziegler-Natta catalysts, it is used industrially to produce polyethylene.
ANSWER: **Phillips** catalyst

4. One of the key depictions of this deity was that of her swallowing the sun, so that it could be reborn each day. For 10 points each:
[10] Name this daughter of Tefnut and Shu, and mother of numerous deities including Osiris, Horus, and Isis, the Egyptian goddess of the sky.
ANSWER: **Nut** **("noot")**
[10] Egyptian deities are often depicted with the heads of animals. Nut was often depicted with the head of one of these animals. The goddesses Hathor and Neith were often depicted with the heads of these animals.
ANSWER: **cows** [prompt on cattle; do not accept or prompt on "bulls"]
[10] Ra was afraid of challengers to his throne, so he forbade Nut from giving birth to children on any day of the year. In order to circumvent this order. Thoth participated in this type of activity with the moon god Khonsu, in order to obtain enough moonlight to construct five additional days so Nut could give birth.
ANSWER: **gambling** or he **gambled** [accept equivalents including anything to do with **gambling** or **betting**]

5. Answer some questions about British adaptations and satires of *Don Quixote*, for 10 points each:
[10] This author is best known for her portrayal of Don Quixote as a woman named Arabella in her novel *The Female Quixote*. She also offered a feminist reading of Shakespeare in her collection *Shakespeare Illuminated*.
ANSWER: Charlotte **Lennox**
[10] This author noted that his novel *Joseph Andrews* was "written in Imitation of the Manner of Cervantes, Author of Don Quixote." He also wrote *Tom Jones*.
ANSWER: Henry **Fielding**
[10] Timothy Crabshaw is reminiscent of Sancho Panza in this Scottish author's novel *The Life and Adventures of Sir Launcelot Greaves*. This man is more famous for creating a character raised by Commodore Hawser Trunnion, Sir Peregrine Pickle.
ANSWER: Tobias **Smollett**

6. Answer the following about historiography in the 19th century United States for 10 points each.
[10] This historian of *France and England in North America* and *The Oregon Trail* names a prestigious prize given annually to a work of American history with literary merit.
ANSWER: Francis **Parkman**
[10] Frederick Jackson Turner's magnum opus was titled for this concept "in American history." Turner analyzed census data to declare that this concept "closed" in 1890 after the surrender of most Plains Native Americans and theorized that this concept was a better center for analyzing American history than the East Coast.
ANSWER: the **frontier**
[10] Mercy Otis Warren, the daughter of James Otis, is best known for a trilogy about this conflict in which her father was a pivotal figure.
ANSWER: **American Revolution**

7. Some small cell lung cancers can secrete this hormone, leading to a syndrome only called "syndrome of inappropriate" this hormone. For 10 points each:
[10] Name this hormone secreted by the posterior pituitary gland that signals the kidneys to retain water. It does this by increasing aquaporin expression in the collecting duct.
ANSWER: arginine **vasopressin** [or **antidiuretic hormone**, **ADH**, **AVP** or **argipressin**]
[10] Vasopressin is produced in this part of the brain. This "master switchboard" of the endocrine system is connected to the pituitary via the hypophyseal portal system.
ANSWER: **hypothalamus**
[10] The central form of this condition results from ADH deficiency, creating large volumes of dilute urine. Mutations in AVPR2 can cause its nephrogenic form.
ANSWER: **diabetes insipidus** [or **DI**; do NOT accept or prompt on "diabetes"]

8. This artist was imprisoned in Martinique with Andre Breton and Claude Levi-Strauss in 1941. For 10 points each:
[10] Name this Cuban painter of *El Tercer Mundo* who also painted the surrealist masterpiece *The Jungle*.
ANSWER: Wifredo **Lam**
[10] Lam's work often was inspired by African masks, as was this painting by Lam's good friend Pablo Picasso that depicts five prostitutes.
ANSWER: *Les* ***Demoiselles d'Avignon***
[10] Picasso depicted this type of person multiple times, including a seated one wearing a black and blue checkered outfit in 1901. He also represented himself as one of these people seated next to a Pierrot and a Monk in *Three Musicians*.
ANSWER: **Harlequin** [prompt on guitarist]

9. Identify the following academics associated with the University of Chicago--none of whom are economists--for 10 points each.
[10] This current Chicago scholar wrote about how Greeks such as Aristotle view moral luck in *The Fragility of Goodness*. She highlighted the experiences of women in developing countries in her 1999 book *Sex and Social Justice*.
ANSWER: Martha C. **Nussbaum**
[10] The founder of the so-called Chicago School of Literary Criticism, this author of *The Languages of Criticism and the Structure of Poetry* opposed New Criticism and argued for a broad definition of the humanities to include the sciences and human institutions.
ANSWER: Ronald Salmon **Crane**
[10] Earlier, this "mother of social work" taught a few classes at Chicago, but never took up a full position. This Nobel winner is probably most notable for co-founding the Hull House with Ellen Gates Starr.
ANSWER: Jane **Addams**

10. Answer some questions about the appearance of Mary Stuart in European literature, for 10 points each.
[10] Lord Darnley is dubbed Arrigo in *Maria Stuarda* in a play by this Italian dramatist, better known for a play in which the title character kills himself after hearing about the approaching Philistine army, entitled *Saul*.
ANSWER: Vittorio Amedeo **Alfieri**
[10] Mortimer kills himself after his plan to rescue Mary Stuart from the prison is discovered in a play by this German playwright, better known for *Die Räuber* **(ROY-ber)**.
ANSWER: Friedrich **Schiller** [or Johann Christoph Friedrich von **Schiller**]
[10] The lovesick speaker "tried shooting myself, but it is so complicated/with the weapons." in the sixth of this author's *Twenty Sonnets to Mary, Queen of Scots*. He may be better known for the collection *A Part of Speech*.
ANSWER: Joseph **Brodsky**

11. Some of the assumptions of this model include assuming no transaction costs, the returns are normally distributed and the risk free rate is known and constant. For 10 points each:
[10] Name this model of option pricing that calculates the theoretical value for a European option and the numerator of the d1 term in this model includes a log of the ratio of the current stock price and the option strike price summed to the quantity r + s squared all times t.
ANSWER: **Black-Scholes**-Merton model
[10] This Lebanese-American statistician maintains that there are several flaws in Black-Scholes and that its formulation was just a manipulation of the risk parameter through dynamic hedging. He also wrote the book *Black Swan* about rare events.
ANSWER: Nassim Nicholas **Taleb**
[10] This lemma is used to determine the derivative of time-dependent function of a stochastic process. It performs the chain rule in a stochastic setting and can help with solving stochastic differential equations which are commonly used in quantitative finance.
ANSWER: **Ito**'s Lemma

12. Answer some questions about important counterexamples in analysis, for 10 points each:
[10] The Weierstrass **(VY-er-strass)** functions are a family of functions which are continuous but exhibit this property nowhere due to the fractal self-similarity of the function's graph. A function may fail to exhibit this property at a cusp.
ANSWER: **differentiability** [or word forms such as **differentiable**]
[10] The converse of the intermediate value theorem is false, as demonstrated by a function developed by John H. Conway and named for this number, in which base it expresses the input in order to determine the value of the function, which takes on every real value in every infinite interval.
ANSWER: **13** [The function is the **Conway base 13 function**]
[10] A non-constant and infinitely continuously differentiable function exists whose derivatives at a certain point are all zero, meaning that it fails to have this property. A real-valued function has this property if it is approximated by its Taylor series within some neighborhood of each point.
ANSWER: **analytic**

13. A group led by Queen Yagowania, the Erie people, were completely wiped out during this series of wars. For 10 points each:
[10] Name this series of wars of expansion that a Native American confederacy fought to gain access to supplies of its namesake trade good. This series of wars was ended by the Treaty of La Grande Paix.
ANSWER: **Beaver** Wars
[10] This confederacy, which at the time included the Onondaga, Oneida, and Mohawk, expanded into the Ohio Country out of their base in upstate New York during the Beaver Wars after trading furs to Europeans for modern weaponry.
ANSWER: **Iroquois** League [accept **Hotinoshonni** or **Haudenosaunee**]
[10] This sixth member tribe of the Iroquois league joined during the Beaver Wars. This tribe, originally from North Carolina, joined the Onondaga, Oneida, Mohawk, Seneca, and Cayuga.
ANSWER: **Tuscarora**

14. Answer the following about the development of minstrelsy in the 19th century US. For 10 points each,
[10] The use of troupes of black-faced minstrels was introduced by this composer of "The Boatman's dance" and "Old Dan Tucker". Despite writing a song adapted as the Confederate national anthem, "Dixie", this composer was a staunch unionist.
ANSWER: Dan **Emmett**
[10] This composer of anti-slavery songs such as "Way down upon the Swanee River" and "My Old Kentucky Home" produced some of minstrelsy's most frequently-performed works, including "Camptown Races" and "Oh, Susanna."
ANSWER: Stephen Collins **Foster**
[10] Emmett and Foster's works were also frequently used at these gatherings frequent in religious communities in the Midwest and South, at which bans on dancing and musical instruments were circumvented by participants singing folk songs and clapping.
ANSWER: **play-parties**

15. Answer some questions related to frogs in ancient Greek literature, for 10 points each.
[10] Homer was originally thought to be the author of *Batrachomyomachia* which depicts a war between frogs and these animals which ends when Zeus sends an army of crabs to prevent the complete destruction of the frog armies.
ANSWER: **mice**
[10] Frogs also provides a chorus for Dionysus and Xanthias as they travel in the underworld in a play by this master of Old Comedy.
ANSWER: **Aristophanes**
[10] In one of Aesop's fables, frogs who desire a king originally receive a log and then a snake who eventually eats them, though authors from the Medieval period replaced the snake with one of these birds. One of these birds offered a fox a narrow bowl of soup that only it can drink with its long beak in another fable.
ANSWER: **stork** [accept **heron**]

16. This law relates the magnetic field to its current sources and, like Coulomb's law, contains a 1 divided by permittivity of free space times 4pi constant term. For 10 points each:
[10] Name this law from electromagnetism that says the line integral of cross product of the current dl and a position vector divided by the magnitude of r prime cubed is proportional to the magnetic field.
ANSWER: **Biot-Savart** Law
[10] When magnetostatics do not apply, Biot-Savart should be replaced by these equations named after a Ukrainian physicist. These equations account for the retarded time for the electric and magnetic fields and incorporate the Lorenz gauge condition.
ANSWER: **Jefimenko**'s equations
[10] This doubly eponymous potential also incorporates the Lorenz gauge condition gives the retarded potentials for a moving point charge. A retardation factor kappa can be incorporated into this potential for the velocity of the moving particle at the source position at the retarded time.
ANSWER: **Liénard-Wiechert** Potential

17. In an obvious allusion to A.J. Ayer, this non-truth word is between the words *Language* and *Logic* in a common undergraduate logic book. For 10 points each:
[10] Name this concept that is paired with *Refutation* in a title of a 1976 posthumous book by Imre Lakatos **(lack-a-TOWsh)** that is framed as a series of Socratic dialogues in which Lakatos offers a challenge to formalism in mathematics.
ANSWER: **Proof**s [accept ***Proofs and Refutation***]
[10] Lakatos collaborated with this Austrian-born proponent of an anarchistic view of science on *For and Against Method*. This thinker tried to attack some "myths" about science in his last book *The Tyranny of Science*.
ANSWER: Paul Karl **Feyerabend**
[10] Lakatos was born in this European country: the same home country of the "founders of Western Marxism" and author of *History and Class Consciousness*, György Lukács, **(jerj loo-KASH)**.
ANSWER: **Hungary** [or **Magyarország**]

18. You are a music lover in medieval Europe. Give the following about what you might listen to, for 10 points each.
[10] If you attend Church services, you can hear the mass sung in a "chant" named after the first pope of this name.
ANSWER: **Gregory** [or **Gregorius**; accept **Gregorian** chant]
[10] Perhaps you're a fan of this woman, whose poems set to music were collected in *Symphony of the Harmony of Celestial Revelations*. You might also see her morality play — the first in history — *Ordo virtutum*, and enjoy its many melodies. Maybe you even get yourself a copy of *Scivias*, which contains her mystical/prophetic visions.
ANSWER: Saint **Hildegard** of Bingen [or **Hildegard von Bingen**]
[10] If you're growing up in the 1300s, your elders may be dismayed that you listen to music in this style. Guillaume de Machaut was a leading composer in this style, whose name was coined in a 1320 treatise by Philippe de Vitry.
ANSWER: ***Ars Nova*** [or **New Art**]

19. For 10 points each, answer the following about the 1521 Diet of Worms **(“Vurms”)**.
[10] It was a hearing for this leader of the Protestant Reformation, who had written 95 Theses against indulgences.
ANSWER: Martin **Luther**
[10] The excommunicated Luther got to have a hearing thanks to the intervention of this elector of Saxony, who was the third of his name and known as "the Wise." This man later hid Luther in Wartburg castle.
ANSWER: **Frederick** III [or **Friedrich** III; accept **Frederick the Wise** or **Friedrich der Weise**]
[10] The "judge" at the Diet of Worms was the archbishop of Trier, who somehow shared his first and last name with a professor who had debated Luther at the University of Leipzig in 1519. Give either the shared first name or the shared last name of those two men.
ANSWER: **Johann** **Eck** [accept either; accept **John**; accept **von Eck**; accept **Johann Maier von Eck**]

20. This religious group is commonly referred to by a name derived from the Maha Mantra, which they commonly chant as part of street preaching, or "Saṇkirtan". For 10 points each:
[10] Identify this religious group founded by A. C. Bhaktivedanta Swami Prabhupada in 1966. They worship the eighth avatar of Vishnu as the "Supreme Personality of Godhead".
ANSWER: **ISKCON** [or the **International Society for Krishna Consciousness**; or the **Hare Krishna** movement]
[10] Followers of ISKCON frequently distribute a translation of this Hindu scriptural work "As It Is". This scriptural work is framed as a discussion between Arjuna and Krishna, and its name literally means "the Song of God."
ANSWER: The **Bhagavad Gita**
[10] Swami Prabhupada designed an ornate palace in this West Virginia town which was later built as a memorial to him after his death. This town is also home to the movement's RVC Temple.
ANSWER: **New Vrindaban**