



PACE NSC 2017 - Round 19 - Tossups

1. The first legislation that legalized the public use of these objects was Nevada's AB511, which mandated that they be identified with decals. The degree of control that these things possess is measured using a scale developed by the SAE that ranges from zero to five. Azim Shariff's "Moral Machine" website evaluates situations akin to the trolley problem in which these objects must "choose between the lesser of two evils." A subsidiary of Alphabet known as (*) Waymo makes these objects, one of which collided with a group of sandbags and was found to be "at fault." Tesla developed "summon" feature for use with these objects. Creators of these things hope they will reduce the rate of accidents. For 10 points, name these road vehicles controlled by computers.

ANSWER: self-driving cars [or driverless cars or autonomous cars or robotic cars; accept vehicles in place of "cars"; prompt on cars or vehicles] <Jose>

2. For this event, a line from "The Song of the Bell" was inscribed on a giant bell commissioned by Theodor Lewald. Avery Brundage rejected a US boycott of this event, and a never-held "People's" version in Barcelona was planned to protest it. The Garmisch-Partenkirchen (PART-in-KEER-kin) was the site of a dress rehearsal for this event, the first of its type to be televised. This event was captured on film by a (*) woman who'd earlier made a propaganda film about the Blood Flag ceremony. Helene Mayer and Rudi Ball were allowed to participate in this event despite the *Völkischer Beobachter's* (FULL-kish-er BAY-oh-"Bach"-ter's) protest about their religion. It was preceded by the first torch relay, and Jesse Owens won four gold medals during it. For 10 points, name this athletics competition held in Germany in 1936.

ANSWER: 1936 Berlin Summer Olympics [or 1936 Berlin Summer Olympics; Games of the 11th Olympiad; prompt on the Nazi Olympics or Summer Olympics] <Bentley>

3. In the *Skanda Purana*, a figure splits itself into two parts: the erotic, golden-skinned Gauri, and this counterpart. This deity is created after the gods found themselves unable to defeat a demon who clones himself every time a drop of his blood is spilled. In another tradition, this deity followed the killing of the demon Daruka with a rampage that was only ended when she bit her tongue after stepping on her husband. This figure, who is considered an aspect of (*) Parvati, is needed to defeat Raktabija and has a name meaning "black goddess." This goddess's name is homophonic with that of the lord of the current age, or *yuga*, that will end with the coming of Kalki. For 10 points, name this Hindu goddess, an aspect of Durga who is worshiped by the *thuggee*.

ANSWER: Kali [or Kalika; accept the Kali Yuga] <Jose>

4. A chapter of this novel describes the narrator waiting at a bridge for a woman with "sharp earrings" whose face she wants. A character in this novel puzzles over the protagonist's mouth in a newspaper photograph while an old man talks about the time he started a 90-person feast by picking two pails of blackberries. In this novel, a ferryman intervenes during a pivotal scene set in a woodshed, which occurs after the man who had burnt Sixo alive, nicknamed (*) schoolteacher, arrives on horseback. At this novel's end, Paul D realizes that the protagonist has chosen to die. The main character of this novel gives birth to Denver while escaping to 124 Bluestone Road. For 10 points, the baby whom Sethe murdered to save from slavery titles what novel by Toni Morrison?

ANSWER: Beloved <Brownstein>

5. This man predicted a grim future where music comes from "talking and playing machines" in his essay "The Menace of Mechanical Music". One of this man's compositions was used by circus bands to signal "disaster" and begin crowd evacuation. Charles Klein wrote a libretto for an operetta by this man in which Don Enrico Medigua kills, and then disguises himself as, the title Peruvian. A composition by this man, once synonymous with the two-step, was commissioned for an essay contest by a newspaper. This conductor of "The (*) President's Own" band added a removable bell to the helicon, a type of bass tuba often named for him. For 10 points, name this composer of *El Capitan*, "The Washington Post", "Semper Fidelis", and "The Stars and Stripes Forever", the American "March King".

ANSWER: John Philip Sousa <Bentley>

6. Characters in this novel make banana jam despite it being illegal for being "too thin for jelly and too thick for jam." A child in this novel convinces herself that another character's evil twin Urumban, whom he'd jokingly invented when she asked him about his attendance at a communist rally, was the one who was savagely beaten by police in the History House. This novel repeatedly discusses laws that "lay down who should be (*) loved. And how. And how much." In this novel, the family business Paradise Pickles and Preserves is kept afloat by the maintenance man Velutha, whose relationship with Ammu breaks caste lines. At the end of this novel, the twins Estha and Rahel begin an affair. For 10 points, name this only novel by Arundhati Roy.

ANSWER: *The God of Small Things* <Brownstein>

7. This mathematician's namesake networks are directed acyclic graphs in which each node is a random variable and the edges are probabilistic dependencies. He conceived of the problem of inferring a distribution for a model about which we only know the outcomes. As more evidence becomes available, one statement named for this man updates a quantity's prior form to its posterior form; that method is called his namesake "inference." A branch of math named for him associates probabilities with degrees of (*) belief, a paradigm of probability theory contrasted with frequentism. Spam filters use math inspired by, for 10 points, what 18th-century English statistician whose most famous theorem relates the conditional probability of X given Y to the conditional probability of Y given X ?

ANSWER: Thomas Bayes [or Bayesian; or Bayes networks; or Bayes' theorem] <Aggarwal>

8. An explosive reaction between these *two* species nearly killed a lab assistant of Henry Le Châtelier (on-REE luh shot-lee-AY). The biological reaction between these two species requires a cofactor called FeMoco. Gerhard Ertl won a Nobel in 2007 for uncovering the mechanism for how these two species react on a potassium-loaded iron catalyst. Normally, these two molecules react exothermically in a (*) 1-to-3 molar ratio at very high temperatures and pressures to give two moles of a gas that is condensed and removed from the reaction, driving equilibrium to the right. One of these gases reduces the triple bond in the other to form a trigonal pyramidal compound used in fertilizers. For 10 points, name these two simple elemental gases that react in the Haber–Bosch process to form ammonia.

ANSWER: hydrogen AND nitrogen gas [or H₂ AND N₂; or protons AND nitrogen gas; or H-plus and nitrogen gas; either order acceptable; prompt on partial answer] <Silverman>

9. An artist who did all of his work in this century painted a still life in which a cat stares hungrily at some oysters next to the title stingray. A magnificent ceiling painting made during this century shows Ludovico Rezzonico standing next to a lion and looking up at Apollo's chariot. Jean-Baptiste-Simeon Chardin (shar-DANN) and Giambattista Tiepolo were active during this century. An artist working in this century set several paintings from his (*) *Progress of Love* series in lush artificial gardens. Another painting made during this century includes a statue of Cupid holding a finger to his mouth as a woman in pink kicks off her shoe while riding the title conveyance. For 10 points, name this century in which Jean-Honoré Fragonard's *The Swing* and other Rococo works were painted.

ANSWER: 18th century AD/CE [or 1700s] <Bentley>

10. A violent advocate of this cause interpreted a tornado striking Kansas as God's approval for her first-ever protests in Kiowa in 1900. William "Pussyfoot" Johnson went undercover in support of this cause. An early advocate of this cause was Neal Dow, who in 1851 passed the Maine Law. An advocate for this cause challenged government officials to arrest her for doing their work for them after she whacked certain items with a (*) hatchet. Carrie Nation was a staunch supporter of this cause. Rhode Island was the only state to not ratify an amendment supporting this cause. It's not suffrage, but a "Woman's Christian" group was founded to support this cause. For 10 points, name this cause, achieved with the 18th Amendment and advocated for by the Anti-Saloon League.

ANSWER: prohibition [or temperance; or banning alcohol; or equivalents about preventing the sale or consumption of alcohol] <Bentley>

11. Laplace fixed Newton's model for the speed of sound by multiplying the pressure by a quantity named for this property to calculate the bulk modulus. This adjective describes a quantum state change in which the probability density evolves with a slowly changing Hamiltonian. In an ideal system with this property, pressure times volume raised to the power of either five-thirds or seven-fifths is constant. On a P–V diagram, curved lines representing processes with this property are (*) steeper than isotherms, and correspond to isentropic processes, such as the expansion phase in a Carnot (car-NOH) cycle. A process has this property if the work equals the change in internal energy, which generally occurs only if the system is insulated. For 10 points, name this type of process in which the net heat is zero.

ANSWER: adiabatic [or adiabatic index] <Silverman>

12. A writer from this country wrote about the "Tiger of the Plains" in a work arguing for civilization over barbarism. This country had a lengthy civil war between the Federalists and the Unitarian League. One leader of this country subjugated indigenous peoples in the Conquest of the Desert and established the *mazorca* police. The Congress of Tucumán declared the independence of this country, which was achieved in the May Revolution. President Juan (*) Manuel de Rosas of this country was criticized in the nonfiction book *Facundo* by Domingo Sarmiento. While led by Bartolome Mitre, this country joined with Brazil and Uruguay to fight against Francisco Solano Lopez in the War of the Triple Alliance. For 10 points, name this country that incorporated most of the Provinces of the Rio de la Plata.

ANSWER: Argentina <Zhou>

13. Members of this profession were kept at *sharashkas*, a special agency within the Gulag, by Lavrentiy Beria. One member of this profession was married to Helsinki Accords activist Yelena Bonner, who delivered his 1975 Nobel Lecture "Peace, Progress, and Human Rights." Another person in this general profession headed the agency VASKhNIL (vahkh-NEEL), where he championed "Michurinism" and "vernalization." Igor (*) Kurchatov headed a group of people in this profession whose work culminated with the "First Lightning" event in Semipalatinsk, Kazakhstan. People in this profession included the fraud Trofim Lysenko and the activist Andrei Sakharov. For 10 points, name this general profession whose practitioners helped the Soviet Union create its atomic bomb.

ANSWER: scientists [or specific types, like physicists or biologists or engineers] <Bollinger>

14. This musician included a so-called "Ballet of the Flying Saucers" in a musical work depicting the "shady lady" Madam Zazz (zadge), a personification of African music. Another album by this musician includes the pieces "Sonnet to Hank Cinq" and "Madness in Great Ones" and is a twelve-part suite setting William Shakespeare to music. This musician, who composed *A Drum is a Woman* and *Such Sweet Thunder*, employed the saxophonist Johnny (*) Hodges and collaborated with the composer-arranger Billy Strayhorn, who wrote a standard inspired by the "quickest way" to get to Sugar Hill in Harlem. For 10 points, name this jazz pianist and one-time bandleader of the Cotton Club, whose orchestra often performed songs such as "Take the 'A' Train" and "It Don't Mean a Thing."

ANSWER: Duke Ellington [or Edward Kennedy Ellington] <Jose>

15. According to a hadith, every Muslim will be able to read the word *kafir*, or "unbeliever," on one of these things belonging to the Dajjal. Types of markings called *tilaka* that are drawn on these things include a Y-shaped or U-shaped symbol called *urdhva-pundra* used by Vaishnavists (VYE-shnah-vists) and three horizontal lines of ash called *tripundra* used by Shaivists (SHY-vists). Rabbinic regulations mandate strapping the left arm with *shel yad* and wearing the other (*) *tefillin* (t'-FILL-in) box above this other body part. This body part is the first body part that one touches while making the sign of the cross. During Ash Wednesday, a priest smudges a cross of ashes on this body part. For 10 points, on which body part do some Hindu women wear a *bindi*, or red dot?

ANSWER: foreheads [prompt on faces or heads] <Cheng>

16. G. E. M. Anscombe asserted that two traditional approaches to this field should be discarded and an ancient approach revived in her essay on the "modern philosophy" of this field. Thomas Nagel and Bernard Williams wrote important papers on the role that circumstance plays in this field's namesake concept, which is known as the concept's namesake "luck." One philosopher's contributions to this field involved a hedonistic calculus and precipitated a divide between contrasting approaches, (*) deontology and consequentialism. The notion that there is no universal manifestation of this concept for all of humanity underlies this field's namesake "relativism." For 10 points, name this branch of philosophy, which, similarly to ethics, is concerned with the determination of right and wrong.

ANSWER: moral philosophy [or morality; accept word forms; accept ethics until read] <Aggarwal>

17. Senescent cells are detected in culture by the activity of a beta-galactosidase named for these cellular structures. Yoshinori Ohsumi (OH-soo-mee) discovered the APG hydrolases in these structures. The enzymes tartrate-resistant phosphatase and cathepsin localize to this organelle in osteoclasts. An enzyme found in these structures hydrolyzes GalNAc (GALL-nack) from the ganglioside GM2. Multi-vesicular bodies ultimately (*) fuse with these structures in receptor-mediated endocytosis. When it binds the autophagosome, this organelle initiates autophagy. Enzyme mutations lead to these organelles' "storage" disorders, like Tay–Sachs disease. Enzymes native to this organelle must be tolerant of very low pH. For 10 points, name these acidic vesicles that degrade proteins and are often called "suicide sacks".

ANSWER: lysosomes [prompt on endosomes; prompt on vacuoles; prompt on vesicles] <Silverman>

18. Characters in a play by this author insert phrases like "our daily mask," "our daily week," and "our daily cue" into the Lord's prayer. In a play by this author, a poet who is later killed by a monkey bite in the Indies gifts a copy of his bad poem "The Couch of Eros," in which other characters place a duel challenge and a drawing of a hermit. In a play by this author, drum and flute music heralds the appearance of actors from barrels on a (*) ship. Thomasina and Septimus waltz at the end of a play by him set at Sidley Park in both 1809 and the present day. A play by this author features two characters who see a coin land on heads 92 times. For 10 points, name this playwright of *Arcadia* and *Rosencrantz and Guildenstern Are Dead*.

ANSWER: Tom Stoppard [or Tomáš Straussler] <Brownstein>

19. A Jewish real estate agent from this state who agreed to help Richard Spencer's mother sell a building was targeted by a harassment campaign led by *Daily Stormer* founder Andrew Anglin. A politician from this home state of Tanya Gersh dismissed the idea of retirement by arguing that Noah built the ark when he was 600 years old. The first Navy SEAL elected to the House of Representatives is from this state. The day before an (*) election called by this state's governor Steve Bullock to fill the seat vacated by the current Secretary of the Interior, the leading candidate responded to questions from *Guardian* reporter Ben Jacobs by body-slammng him. Greg Gianforte nevertheless defeated Rob Quist in, for 10 points, what state home to Ryan Zinke and current Democratic senator Jon Tester?

ANSWER: Montana <Carson>

20. This character makes a "great and edifying entertainment" out of the adventures of his demon in a Kafka parable revealing the "Truth about" this character. This character whips a grove of trees in order to get out of whipping his buttocks 3,300 times, which a servant disguised as the ghost of Merlin had ordered him to do. This character wisely settles disputes after the Duke and Duchess set him up as governor of a village they call the (*) "Island of Barataria." This character restrains his laughter when another character mistakes a barber's basin for the golden helmet of Mambrino. This proverb-spouting character rides the donkey Dapple, helps in the search for Dulcinea, and warns another man that a group of giants are actually windmills. For 10 points, name this squire of Don Quixote.

ANSWER: Sancho Panza [or Sancho Panza] <Brownstein>

21. "Revolving rivers" are formed by depositing this solid material onto a base that undergoes rotation. "Hard stabilization" techniques are designed to prevent the movement of this material; such techniques include using large rocks to build groins that run parallel to each other. A ridge of this material comprises a tombolo, which connects an island to the mainland. Engineers will often build breakwaters and (*) jetties to prevent the movement of this substance, which is often accumulated onto a namesake "spit" through longshore drift. Technically, this term refers to a material whose grain size is finer than a pebble, but is coarser than silt. Particles of this substance are comprised of mostly silicon dioxide. For 10 points, name this substance often found at beaches.

ANSWER: sand <Jose>



PACE NSC 2017 - Round 19 - Bonuses

1. Name these things you might find in a cave, for 10 points each.

[10] These speleothems protrude from the ground and may create a column if they fuse with their counterparts that hang from a cave ceiling.

ANSWER: stalagmites

[10] "Rafts" of this mineral often form on top of subterranean lakes in limestone caves. This carbonate is also the main constituent of stalagmites and stalactites.

ANSWER: calcite

[10] Very fine crystals comprise this gooey, white substance in caves. It is formed by the precipitation of dripwater and is believed to be created with the help of bacteria.

ANSWER: moonmilk [or mondmilch] <Jose>

2. Captain Tiago forbids his daughter Maria Clara from marrying Crisóstomo Ibarra after Ibarra threatens the life of the fiendish friar Dámaso Verdolagas in a novel from this country. For 10 points each:

[10] Name this country home to the author of the 1887 novel *Noli Me Tangere*.

ANSWER: the Philippines [or Republic of the Philippines; or Republika ng Pilipinas; accept Filipino or Pilipino]

[10] Though his work is now more commonly read in Tagalog or English, José Rizal originally wrote *Noli Me Tangere* and its sequel *El filibusterismo* in this European language, used at the time by the colonizers of the Philippines.

ANSWER: Spanish language [or Español]

[10] The third volume of English-language Filipino author F. Sionil José's *Rosales Saga* is titled *My Brother, My this word*. Norman Mailer's extensive tome about convicted murderer Gary Gilmore is titled for this specific occupation's "song".

ANSWER: executioner [accept *My Brother, My Executioner* or *The Executioner's Song*] <Carson>

3. Answer the following about eternally-burning places, for 10 points each.

[10] The so-called "Door to Hell", a football-stadium-sized cavern that has been burning natural gas for over fifty years, can be found in this desert that spans much of Turkmenistan.

ANSWER: Karakum Desert

[10] The world's longest continuously-burning fire is thought to be a 6,000 year old fire on the aptly-named Burning Mountain, which can be found in this state south of Queensland and east of South Australia.

ANSWER: New South Wales

[10] Mount Chimera, an ever-burning mountain in ancient Lycia, is thought to be equivalent to the site of Yanartaş (**YAH-nar-tash**) in this modern country. Most of this country is in Anatolia in Asia, but its westernmost portion is on the Balkan peninsula in Europe.

ANSWER: Turkey [or the Republic of Turkey; accept Türkiye Cumhuriyeti] <Jose>

4. The pessimistic philosopher Philipp Mainländer argued that the universe is the product of God performing this action in *The Philosophy of Redemption*, after whose publication he performed this action himself. For 10 points each:

[10] Name this action, which Albert Camus declared to be the only serious philosophical question in "The Myth of Sisyphus."

ANSWER: **suicide** [or **killing oneself**; or equivalents; prompt on **dying**]

[10] Bioethicists debate the morality of this practice of intentionally ending a life to relieve suffering when it is done at the patient's request. Christian existentialist Paul-Louis Landsberg defended this practice in *The Moral Problem of Suicide*.

ANSWER: **euthanasia** [prompt on **doctor-assisted suicide** or similar answers]

[10] Emil Cioran explored his attraction to suicide in a book titled for being *On the Heights of* this emotion. Kierkegaard wrote that this feeling arises from not being aligned with God in *The Sickness Unto Death*.

ANSWER: **despair** <Kothari>

5. Archaeologists usually refer to fragmentary remains of this art form as "sherds", to distinguish from glass "shards". For 10 points each:

[10] Identify this art form in which vases, jars, and the like are produced from kiln-fired clay, which is sometimes "thrown" on a namesake wheel.

ANSWER: **pottery** [accept **ceramics** or **earthenware**]

[10] Ancient Greek pottery was often decorated in one of two styles, in which one of two colors was used to depict figures and the other was used to depict the background. Give *both* of the English names of the colors used to refer to those styles.

ANSWER: **red** AND **black** [accept **red-figure pottery** AND **black-figure pottery**; accept "vase painting" or "style" in place of "pottery"; prompt on partial answers]

[10] The oldest extant pottery from Japan is named for this term, which means "rope-patterned" or "cord-marked" and is also used to refer to the period of Japanese history lasting from 14,000 BC to 300 BC. Much like the period, this type of pottery was succeeded by Yayoi pottery.

ANSWER: **Jomon** pottery [or **Jomon doki**] <Carson>

6. The distance travelled by an object undergoing this type of motion varies with the square root of time. For 10 points each:

[10] Name this type of motion in which an object's path is completely stochastic. Diffusion and Brownian motion are often modelled as this sort of motion if there is no chemical gradient.

ANSWER: **random walk** [prompt on partial answer; prompt on **random** process; prompt on **Wiener** process]

[10] If no energy is input, the driving force for random walk is this law of thermodynamics, which states that entropy will always increase in an isolated system.

ANSWER: **Second** Law of Thermodynamics

[10] The probability that a random walker is at any given coordinate at a given time has this functional form. The wavefunction of a free particle also has this functional form, which can be represented mathematically as the exponential of a negative variable squared.

ANSWER: **Gaussian** function [or **Gaussian** distribution] <Silverman>

7. One of these things was run by *Literary Digest* starting in 1916 from mails sent to up to ten million people. For 10 points each:

[10] Identify these important tools in modern American politics. An organization which frequently conducts these things was founded by George Gallup.

ANSWER: presidential **polls** [prompt on surveys]

[10] Even though it received 2.3 million responses, the runners of the *Literary Digest* poll badly mis-predicted the results of the election in this year due to self-selection bias. Gallup correctly predicted that the Governor of Kansas would not win the election held in this year.

ANSWER: US Presidential Election of **1936**

[10] Gallup himself was embarrassed by failing to predict the result of the 1948 election. The most infamous organization to get the results of that election wrong was this newspaper, which ran the headline "Dewey Defeats Truman".

ANSWER: ***Chicago Daily Tribune*** [prompt on partial answer] <Bentley>

8. The law of the Midi proscribed that people guilty of this crime had to run naked through a course as an official tried to whip the guilty party. For 10 points each:

[10] Name this crime. When people were caught committing this crime *in flagrante delicto* in the Middle Ages, it was often justifiable for the husband who discovered the crime to murder his wife or the other guilty party.

ANSWER: **adultery** [prompt on synonyms such as infidelity or cheating; prompt on fornication or extramarital sex]

[10] An adulterous couple could get back together after a two-year trial period according to this law code, which was officially called the *Corpus Juris Civilis* and was compiled by scholars under Tribonian in the 6th century.

ANSWER: Code of **Justinian** [or *Codex Justinianus*]

[10] The tradition of Roman law, which held that only women could be guilty of adultery, originated with this Roman law code of the 5th century BCE, which was drawn up after a plebeian secession and is named for its number of statutes.

ANSWER: Law of the **Twelve Tables** [or Leges **Duodecim Tabularum**; or **Duodecim Tabulae**] <Bentley>

9. In this novel, a boy is shot while singing a song about Voltaire and Rousseau and collecting cartridges from dead bodies. For 10 points each:

[10] Name this novel in which the plucky street urchin Gavroche fights in the rebellion of a group of students called the Friends of ABC.

ANSWER: *Les* **Misérables** [prompt on *Les Miz*]

[10] This French author of *The Hunchback of Notre Dame* wrote *Les Misérables* while in exile on the island of Guernsey (GURN-zee).

ANSWER: Victor Marie **Hugo**

[10] In *Les Misérables*, Gavroche and his brothers live inside a plaster statue of one of these animals that Napoleon planned to turn into a bronze monument on the site of the Bastille.

ANSWER: **elephants** <Brownstein>

10. Because these texts are only advisory, they often end with the phrase "Allahu a'lam" (uh-LAW-hoo "Al"-um), or "God knows best." For 10 points each:

[10] Name these Islamic issuances of opinion, which are typically dispensed by scholars called *mufti*. Ayatollah Khomeini issued one calling for the death of Salman Rushdie for penning the novel *The Satanic Verses*.

ANSWER: **fatwa**

[10] Scholars often draw on two sources for a *fatwa*: one source is the Qur'an, which are divided into these units. The "Al-Ma'ida" one of these sections is often cited in *fatwas* discussing blasphemy or *haram* food.

ANSWER: **suras**

[10] The other source from which *fatwas* are drawn is this set of customs and norms of the community of Islam. This term literally means "the path".

ANSWER: **sunnah** [do not accept or prompt on "sunni"] <Jose>

11. One work in this genre by John Haberle features objects such as a racy photograph of a woman and a pamphlet titled "How to Name Baby" on the title *Bachelor's Drawer*. For 10 points each:

[10] Identify this genre of still-life which tries to trick the viewer into believing the painting is real. The name for this genre comes from a French term meaning "deceive the eye".

ANSWER: **trompe-l'œil** (tromp-LOY)

[10] The 19th-century trompe-l'œil master William Harnett made four versions of a painting titled "After" this activity that depict objects such as a key, a horn and a rabbit. Two huge crows in the top-right menace another figure in a Winslow Homer winter landscape titled for a type of this activity.

ANSWER: the **hunt** [or **hunting**; or *The Fox Hunt*]

[10] Many Renaissance palaces have halls in which this part of the room is decorated in trompe-l'œil fashion to make it seem as if this part of the room opens to the sky.

ANSWER: **ceiling** <Bentley>

12. In a design inspired by biology, most industrial heat exchangers operate in this configuration. For 10 points each:

[10] Name this configuration in which heat and mass transfer between two streams is maximized by having the streams flow in opposite directions. A classic example of it is how the driving force for osmosis is multiplied in the two branches of the loop of Henle (HEN-lee).

ANSWER: **countercurrent** configuration [or **countercurrent** mechanism; or **countercurrent** multiplication]

[10] The countercurrent multiplier in the loop of Henle relies on the fact that cells in the ascending limb do *not* express the class I type of these membrane proteins, which are overexpressed in the tubules upon stimulation by vasopressin.

ANSWER: **aquaporins** [or **AQP**-1; prompt on water channels]

[10] Countercurrent exchange is also used in these organs in fish, where blood flows opposite the direction of motion. As a result, gas exchange in these organs' lamellae (luh-MELL-ay) is optimized.

ANSWER: **gills** <Silverman>

13. A 2012 novel takes its title from a religious statue that a picture-bride of this ethnicity leaves in her house when she is sent to a camp. For 10 points each:

[10] Name this ethnicity of Julie Otsuka (**OATS-kah**), the author of *The Buddha in the Attic*, which like her first novel, *When the Emperor was Divine*, deals with the treatment of people of this ethnicity during World War II.

ANSWER: **Japanese-American**

[10] Party-goers led by Twinkle find religious statues in an attic in the story "This Blessed House," which appears in this collection. In a story from this collection, Miranda's married lover whispers "you are sexy" during a visit to the Mapparium.

ANSWER: **Interpreter of Maladies**

[10] *Interpreter of Maladies* is the debut collection by this Indian-American author of *The Namesake* and *The Lowland*.

ANSWER: Jhumpa **Lahiri** <Brownstein>

14. Methods in this branch of economics include regression discontinuity design, in which similar data is divided into treatment and control groups to test the effects of interventions. For 10 points each:

[10] Name this subfield of economics that attempts to apply statistics to empirical economic data. One of its most famous studies by Card and Krueger analyzed the employment impact of a minimum wage increase.

ANSWER: **econometrics**

[10] This other branch of economics studies decision-making by firms and individuals. According to the Sonnenschein–Mantel–Debreu Theorem, this branch's assumptions have limited macroeconomic implications.

ANSWER: **microeconomics**

[10] This intersection of psychology with economics studies how people respond to incentives and their violations of the standard rationality assumptions of microeconomics. Daniel Kahneman's *Thinking Fast and Slow* is one of the foremost popular texts in this field.

ANSWER: **behavioral** economics [or **BE**; or **behavioral** finance] <Aggarwal>

15. Answer the following about Andrew Norman's piece *Play*, for 10 points each.

[10] In "Level 1" of *Play*, this section of the orchestra has powers over the others. For example, the triangle turns the orchestra on or off, while the slapstick and kick drum can make the players "cut to a different world."

ANSWER: **percussion**

[10] This instrument's oft-stymied attempts to play a descending major scale form a narrative thread in the latter two movements of *Play*. This woodwind instrument represents the duck in Prokofiev's *Peter and the Wolf*.

ANSWER: **oboe**

[10] Norman refers to the melodic wedge tying together the movements of *Play* as this kind of motif. Hector Berlioz used this French term to describe the recurring melodic theme of the love interest in *Symphonie fantastique*.

ANSWER: **idée fixe** (ee-day FEEKS) <Kothari>

16. One writer wrote that "nothing so much conduces to" this effect "as the catachresis," in which one might write "Mow the beard, shave the grass." For 10 points each:

[10] Name this term that refers to a ridiculous failure at sustaining a lofty tone, as when serious events are juxtaposed with trivial ones. Its modern use originates from a satirical manual modeled on Longinus's *On the Sublime*.

ANSWER: **bathos**

[10] The author of *Peri Bathous* also wrote this mock-epic, in which Belinda ignores Clarissa's admonishment to maintain her "good humor" after the Baron steals a piece of her hair.

ANSWER: *The **Rape of the Lock***

[10] *Peri Bathous* and *The Rape of the Lock* were written by this author of *The Dunciad*.

ANSWER: Alexander **Pope** <Kothari>

17. Though this man was originally seen as a conservative, after becoming an Archbishop he spoke out against his government's human rights abuses. For 10 points each:

[10] Name this Archbishop who was gunned down while giving mass. He was beatified by Pope Francis in 2015, and was considered a proponent of liberation theology.

ANSWER: Oscar **Romero**

[10] Romero hailed from this smallest country in Central America, which fought a devastating civil war throughout the 1980s. Earlier it fought the Soccer War with its neighbor Honduras.

ANSWER: **El Salvador**

[10] The U.N.-approved Truth Commission for El Salvador blamed this death squad leader and founder of the ARENA party for Romero's assassination.

ANSWER: Roberto **D'Aubuisson** (DAH-b-wee-sawn) <Raje>

18. Dorothy Hodgkin used this technique to obtain atomic-level resolution of protein structure. For 10 points each:

[10] Name this analytical technique that determines the distance between atomic planes in an ordered sample by observing the spacing of interference fringes according to Bragg's law.

ANSWER: X-ray **crystallography** [or X-ray **diffraction**; or **XRD**; or protein **crystallography**]

[10] Bragg's law relates the spacing of the interference maxima to this distance symbolized lambda, which is usually around a nanometer for an X-ray.

ANSWER: **wavelength**

[10] Nowadays, crystallography is being replaced as a method of determining protein structures by this technique, which doesn't require any finicky crystallization techniques. Instead, it relies on measuring the number of particles that pass through a thin sample slice at the temperature of liquid ethane.

ANSWER: **cryoelectron microscopy** [or **cryo-EM**; or **cryogenic electron microscopy**; or **cryogenic EM**; or **cryogenic transmission electron microscopy**; or **cryogenic TEM**; or **cryo-transmission electron microscopy**; or **cryo-TEM**; prompt on **electron microscopy**; prompt on **transmission electron microscopy**; prompt on **EM** or **TEM** or **microscopy**] <Silverman>

19. While fleeing the demands of his twin brother Aegyptus and his fifty sons, this man seeks protection from a king of Argos named either Pelasgus or Gelanor. For 10 points each:

[10] Name this figure from Greek mythology who, with Polyxo, Pieria, and possibly others, fathered fifty daughters.

ANSWER: **Danaus** [accept the **Danaides**]

[10] Eventually, Danaus capitulated to Aegyptus's demands, but instructed his daughters to perform this action on their wedding night. After the Trojan War, Clytemnestra had her lover Aegisthus assist her in performing this task, resulting in Agamemnon's death.

ANSWER: **killing their husbands** [accept synonyms for "killing" like **murdering** or **beheading** and synonyms for "husbands" like **grooms**; accept **killing Aegyptus's sons**; accept **mariticide**, but DO NOT accept "matricide"]

[10] Only one of Danaus's daughters opted not to kill her husband, because that husband, Lynceus, had chosen to respect her virginity. Give *either* of the two names commonly assigned to that Danaid, one meaning "much-wooed" and one meaning "blameless".

ANSWER: **Hypermnestra** or **Amymone** <Carson>

20. This man worked with Gerhard Johann David von Scharnhorst to reform the Prussian army after he was released from captivity following the Battle of Jena (**YEN-ah**). For 10 points each:

[10] Identify this general who led the Military Academy at Berlin from 1818 to 1830. This man's best known text advocated fighting decisive battles to completely defeat the enemy.

ANSWER: Carl von **Clausewitz** [or Carl Philipp Gottlieb von **Clausewitz**]

[10] Clausewitz, who wrote a book titled for this subject, defined it as "merely the continuation of policy by other means." Sun Tzu wrote a text on the art of this practice.

ANSWER: **war** [or **warfare**; or *On War*; or *Vom Kriege*]

[10] This French politician defined war as a "series of catastrophes followed by a victory." This prime minister earned the nickname "The Tiger".

ANSWER: Georges **Clemenceau** <Bentley>

21. The ninth abbot primate of this religious order, Notker Wolf, played guitar for the band Feedback. For 10 points each:

[10] Name this religious order, sometimes called the Black Monks to contrast them with the Cistercians. Their motto *ora et labora* epitomizes their lifestyle of "prayer and work."

ANSWER: **Benedictines** [or the Order of Saint **Benedict**]

[10] Saint Benedict founded this country's Abbey of Monte Cassino, often said to be the first center of monastic life in the West. Benedict was born in Nursia, a city in what is now in this modern-day country.

ANSWER: **Italy** [or **Italian Republic**]

[10] Members with this trait within the Benedictines are protected by Saint Scholastica. The mystic Hildegard von Bingen is perhaps the most celebrated Benedictine with this trait.

ANSWER: being **female** [or a **nun**; accept answers that convey the idea that they are **women**] <Jose>