NEW TRIER SCOBOL SOLO 2012
CHAMPIONSHIP
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Phase I

1. Dayton Miller's attempt to recreate this experiment was unsuccessful, possibly because he did not control for temperature gradients. It was carried out in the basement of a stone building on top of a stone apparatus, using a pool of mercury to reduce vibration. A variation performed later by Kennedy and Thorndike required time dilation in addition to the length contraction used to explain this experiment whose results were further verified by the Ives-Stilwell experiment. It was performed in 1887 at Western Reserve University, and its results led to the development of Lorentz transformations. The people who carried it out did not correctly interpret its negative result. Name this experiment which attempted to use an interferometer to find the luminiferous ether.
ANSWER: **Michelson-Morley** experiment

2. This country's Pattani River ends at its namesake town in the Yala Province on its east coast. Its largest lake has a northern portion going up to the Ranot Region and a smaller southern portion in its namesake Songkhla Region. Part of its western border is formed by the Kraburi River on the Kra Isthmus. This country also contains the coastal town of Rayong, where a chemical explosion killed twelve people in 2012. Its northeast region contains the Khorat Plateau, and much of its northeast border is formed by the Mekong River, which separates this country from the capital of Laos, Vientiane. Its southern region is between Myanmar and Malaysia. Name this country whose capital—located at the mouth of the Chao Phraya [PRY-ah] River—is Bangkok.
ANSWER: Kingdom of **Thailand** [or Ratcha Anachak **Thai** or **Prathet Thai**]

3. Several hundred soldiers were killed in this battle when Saunders Field caught fire from the shooting of guns in close quarters. This began when troops under Gouverneur Warren intercepted Richard Ewell's Second Corps on the Orange Turnpike. Confederate generals Leroy Stafford, John Jones, and Micah Jenkins were killed at this battle, and James Longstreet was accidently shot by one of his own men. Though Grant wanted to avoid fighting on the same battlefield where Chancellorsville had been fought on a year earlier, Lee attacked first in an attempt to use the terrain as a counter to Grant's superior numbers. Name this battle that ended about three days before the Battle of Spotsylvania Courthouse, the first battle of the Overland Campaign.
ANSWER: Battle of the **Wilderness** [or **Wilderness** campaign]

4. One book by this author includes descriptions of Diomira, which has sixty silver domes; and Isidora, where perfect telescopes and violins are made. It includes descriptions Marco Polo tells to Kublai Khan. A story by this author claims that people used to be able to climb ladders from rowboats to reach the moon. A novel describes the Cimbrian People's Republic, which replaced the nation of Cimmeria. That novel alternates chapters between several novels and a person reading those novels. Name this Italian author of *Invisible Cities*, "The Distance of the Moon"—which appears in his *Cosmicomics*—, and *If on a winter's night a traveler*.
ANSWER: Italo **Calvino**

5. An auto-immune response against these cells is the most common cause of Guillain–Barré [ghee-yahn bar-ray] syndrome, and the spaces between layers formed by them are called Schmidt-Lanterman incisures. These cells, which can be modified to form the tissue in a Pacinian corpuscle, perform a similar function as oligodendrocytes and are also known as neurolemmocytes or neurilemma cells. These differentiated cells are used in transplants to repair spinal cord injuries and naturally maintain structures necessary in the repair of motor neurons. Name these glial [GLEE-ul] cells of the peripheral nervous system which surround axons and build the myelin sheath, named after a German physiologist.
ANSWER: **Schwann** cells [accept **neurolemmocyte**, **neurilemma** cells, or **glia**l cells until each is mentioned; prompt on **neuron**s or **nerve cell**s before "Pacinian"]

6. In a play by this writer, Dr. Kreuzer tries to help James discover what he did to cause his father H. C. Callifer to become an atheist twenty years earlier in a potting shed. He also wrote about Alden Pyle and journalist Thomas Fowler in a novel set in Vietnam in the early 1950s, and about a fake spy named James Wormold in a work set in Cuba. He also wrote a novel in which Maria has a baby named Brigitta, whose father is pursued by a lieutenant because they are in a region that has outlawed Catholicism in Mexico and is known only as "the whisky priest". Name this author of *The Quiet American*, *Our Man in Havana*, and *The Power and the Glory*.
ANSWER: (Henry) Graham **Greene**

7. A man crouches over a railing and holds a tin cup while his counterparts push ahead in this person's *White Angel Breadline*. This employee of the Farm Security Administration depicted a distressed Florence Owens Thompson in a pea pickers' camp. Like Ansel Adams, this artist received a commission from the federal government to document the movement of "evacuees" at California's Manzanar camps for Japanese-Americans, and this artist co-founded the magazine *Aperture*. Name this photographer whose Great Depression-era works include *Migrant Mother*.
ANSWER: Dorothea (Margaretta **Nutzhorn**) **Lange** [accept either underlined name, accept **White Angel Breadline** before it is mentioned]

8. These mappings are also known as transvections or row-addition transformations. Like dilations, contractions, and coordinate swaps, they can be represented by elementary matrices, which are matrices one row operation from the identity matrix, so they have ones on the main diagonal and exactly one nonzero value off it. These functions preserve volume, and also preserve exactly one line. The factors named for these transformations are the ratio of the distance a point moves divided by the distance that point is from the fixed line. Name this mapping that transforms the point (x,y) into the point $(x+ky,y)$.
ANSWER: **shear** transformations [or **shear** map(ping)s; accept word forms of **shear**]

9. This person and Count Ludwig von Cobenzl signed the Treaty of Lunéville, and this person also signed the Treaty of Amiens [am-yehn] which brought a rare time of peace during the reign of Napoleon. Before being replaced by his brother-in-law Joachim Murat, this man was the King of Naples and Sicily. His next role was based on his Bayonne Statute and led to him being credited for ending the Spanish Inquisition in 1808. Name this man who was crowned King of Spain during the Peninsular War, the older brother of Napoloeon.
ANSWER: **J**oseph Bonaparte [accept King **José** I or **G**iuseppe Buonaparte, prompt on **Bonaparte**]

10. A clear explanation of this problem was provided by Mancur Olson, who provided the solution of byproduct theory and built upon earlier works by Paul Samuelson. Ronald Coase wrote that this problem can be overcome in situations with low transaction costs, and rational choice theory attempts to overcome it with proper incentives. This concept was articulated to some extent by David Hume, who noted that it is easier for two people to work together on a problem than for hundreds of people to work together. It generally applies to goods that are non-excludable and non-rivalrous, otherwise known as public goods. Name this problem in which individuals use more of a resource than they pay for.
ANSWER: **free rider** problem [prompt on **collective** in**action** or **self-interest**]

11. The equation named for this scientist has been modified to account for the temperature dependence of liquid viscosity, though that rule seems to break down for glass-forming materials. One form of his equation takes the derivative of a so-called constant with respect to temperature and sets it equal to a fraction with the gas law constant times temperature squared in the denominator. He showed the exponential relationship between activation energy and rate constant. Name this chemist who defined acids within aqueous solutions as substances that increase the hydrogen ion concentration.
ANSWER: Svante **Arrhenius** [ar-AY-nee-us]

12. The subject of this poem has "a mind at peace with all below". It is in perfect iambic tetrameter except for the fourth line, which begins "Meet in her aspect", and it has three six-line stanzas. By looking at the subject of this poem, the narrator can tell that her thoughts have a "pure" and "dear" dwelling place. In possible contrast to Shakespeare's sonnet comparing a woman to a summer's day, this poem says its subject is "like the night of cloudless climes and starry skies". It was written in 1814, before its writer left his wife and England amidst scandalous rumors of affairs. Name this work describing an idealized woman, written by Lord Byron.
ANSWER: "**She Walks in Beauty**"

13. In this painter's works depicting the sculptor of *Water Nymph and Bittern*, a nude model is used even though the sculpture is clothed. In addition to those works showing William Rush, this painter made a portrait of a professor who pets a black cat as he reads a book, Benjamin Rand. One of his outdoor works that shows a young man standing on a rocky promontory while another lies on it, another sits, and another dives off it. Another painting shows his high school classmate on the Schuylkill [SKOO-kul] River in Philadelphia and is entitled *Max Schmitt in a Single Scull*. Name this artist who also painted surgery demonstrations in *The Agnew Clinic* and *The Gross Clinic*.
ANSWER: Thomas (Cowperthwait) **Eakins**

14. Many leaders of this country have claimed to be descendants of Al-Hadi ila'l-Haqq Yahya and Al-Mansur al-Qasim and have been considered parts of the Rassid and Qasimid dynasties. It gained some independence in 1913 with the Treaty of Daan and was ruled by Imam Yahya until he was assassinated in 1948 and replaced by his son. During a 1960s civil war, forces supported by Egypt fought against the Mutawakkilites supported by Saudi Arabia, and this country was split with part of it under a communist government from 1970 to 1990. More recently, its Houthis have tried to establish a Zaydi Islamic state and a revolution forced Ali Abdullah Saleh from power. Name this poor Middle Eastern nation that in 1992 agreed to its border with Oman.
ANSWER: Republic of **Yemen** [or al-Jumhūrīyah al-**Yamanīyah**]

15. A method developed by George Dantzig to solve these types of problems uses slack variables and pivot operations within a canonical tableau and is known as the simplex algorithm. When these problems involve only two independent variables, they can be visualized by determining which lines with given slopes have exactly one intersection point with a convex polyhedron on the Cartesian plane. That convex polyhedron represents the feasible region, which is expressed using a set of inequalities that come from the constraints. Name these optimization problems in which the constraints and the function being optimized must be first-degree polynomials.
ANSWER: **linear program**ming [prompt on partial answers; prompt on **optimization** or finding **extreme values** or finding **maxima** or finding **minima** or **minimization** or **maximization** or variations thereon]

16. This composer was sued by Luigi Denza for incorporating the song "Funiculì, Funiculà" into the "Scenes from Neapolitan Life" section of his *Aus Italien*. He composed "Im Abendrot"—meaning "At Sunset"—when he was eighty-four; that is one of his *Four Last Songs*. Some of his early use of dissonance is found in *Ein Heldenleben*, or *A Hero's Life*, which has a fifth section that references many of his earlier works such as *Don Juan*, and that dissonance was picked up in his later operas such as *Feuersnot* and *Salome*. Name this composer whose "Sunrise" section from *Also sprach Zarathustra* was used in the movie *2001: A Space Odyssey*.
ANSWER: **R**ichard **Strauss** [SHTRAOS] [prompt on **Strauss**]

17. This author wrote about Dave Saunders borrowing a Sears Roebuck catalog from Fat Joe so he can ask his mom to buy a gun in "The Man Who Was Almost a Man", a story in his collection *Eight Men*. Another of his stories, in which Bobo, Lester, and Buck are killed after going swimming, is "Big Boy Leaves Home" and appears in the collection *Uncle Tom's Children*. In a novel by this author, a detective named Britten tries to determine whether a communist named Jan or the protagonist has killed Mary Dalton. Mary was in fact suffocated by the protagonist Bigger Thomas. Name this African American author of *Native Son*.
ANSWER: Richard (Nathaniel) **Wright**

18. The geometric type of this kind of function was originally developed for computer vision but is now used in, among other applications, fingerprint recognition. A function of this type is used by the Rabin-Karp algorithm to efficiently search for examples of plagiarism. Rainbow tables list pre-calculated outputs of these functions, which in most practical examples have pairs of values that map to the same output, called a collision. Algorithms to generate them include SHA-1 and MD5, which output an index based on the input, called a "key"; those indices, which are also known by this term, can be listed in a map or table named for them. Give this term associated with the tagging of objects using a pound sign.
ANSWER: **hash**(ing) function [accept **hash** table; accept **hash** tag]

19. The Bible claims that this woman is buried on the road from Bethel to Ephrath, and what is generally believed to be her tomb is now in a Muslim cemetery near Bethlehem. She met her husband while tending her father's sheep when he kissed her and said he was her cousin. Her handmaid Zilpah gave birth to Gad and Asher with this woman's husband before this woman gave birth to her first son, Joseph. Women visit her tomb to pray for a successful childbirth, which is ironic because she died while giving birth to Benjamin. After working for seven years, her husband mistakenly married her older sister, and had to work an extra seven years to marry this woman, his favorite wife. Name this niece of Rebecca, husband of Jacob, and sister of Leah.
ANSWER: **Rachel** [or **Rakhel**]

20. This person was the first choice of Ulysses Grant to fill a Supreme Court vacancy, but he died before taking the oath of office. Earlier, he replaced Allan Pinkerton with Lafayette Baker as the head of the National Detective Agency, and the two of them eventually worked together to prosecute the conspirators who helped John Wilkes Booth. After serving as Attorney General briefly at the end of the Buchanan presidency, he assisted Simon Cameron and then replaced him as Secretary of War. This person was kept in the cabinet by President Johnson, but in 1867 Johnson tried to replace him. Name this Secretary of War whose attempted removal may have violated the Tenure of Office Act, leading to Johnson's impeachment.
ANSWER: Edwin (McMasters) **Stanton**

Phase I Tiebreakers

TB-I1. One of this director's films compares images of Jesus Christ with those of deities from other religions and serves as an example of his idea of "intellectual montage". Another film directed by this man ends with a massacre of factory workers in an open field, which is alternated with images of cattle being slaughtered. This director of *October* and *Strike* created a film in which the title character successfully resists the Teutonic Knights at the Battle of the Ice. His most famous film features a massacre of civilians on the Odessa Steps by Tsarist troops. Name this Soviet director of *Battleship Potemkin*.
ANSWER: Sergei (Mikhailovich) **Eisenstein**

TB-I2. Polybius notes that this general saved his father's life during the Battle of Ticinus, after which he was given the office of *curule aedile*. This general later became the first private citizen to lead the Roman proconsular command. After defeating Hasdrubal Barca at Baecula, this general outmaneuvered a larger force to win the Battle of Ilipa. However, his greatest military victory was his triumph over the son of Hamilcar Barca at the Battle of Zama. Often held responsible for ending the Second Punic War, who is this Roman general who defeated Hannibal?
ANSWER: (Publius Cornelius) **Scipio Africanus** (Major)

TB-I3. The two main characters in this work are advised to go to Lepreum in Elis or Opuntian Locris after they leave Athens. When threatened by an attack from the chorus, they prepare to use stew pots to protect themselves, and when questioned by Trochilus, they claim to be a fearling and a crapple. In this work, Iris is captured but allowed to return to her father Zeus, and Prometheus advises Pisthetaerus [PISS-thuh-TAIR-us] on how to outwit three negotiators that Zeus sends. At the beginning of this work, Pisthetaerus and Euelpides [yoo-EL-pih-deez] seek out Epops, who was a prince named Tereus but turned into a Hoopoe. Name this work by Aristophanes that involves Cloudcuckooland.
ANSWER: The **Birds** [or **Ornithes**]

TB-I4. The L^2 ["L two"] inner product requires this operation to be applied to the second function. For Fourier series in terms of complex exponentials, this operation relates the nth Fourier coefficient to the negative nth one. A Hermitian matrix is equal to the result of this operation applied to its transpose. For numbers in polar form, this operation negates the argument. The square magnitude of a number results from multiplying it by itself under this operation. If a polynomial with real coefficients has a complex root, then that root under this operation is also a root. This operation, denoted by an asterisk or an over-bar, turns 3 plus i into 3 minus i. Identify this operation that negates the imaginary part of a complex number.
ANSWER: complex **conjugate** [or complex **conjugation**]

Phase II

21. A 2012 commercial attacking this politician repeatedly quoted him saying "I am doing what the president wants me to do", accusing him of abandoning his state when he was governor. Joe Biden mistakenly called him Tom during a campaign stop even though this person was once the Chairperson of the Democratic National Committee from 2009 to 2011. His opponent in this year's Senate race was aiming for the seat he lost in 2006 to Jim Webb after being caught on camera using a racial slur. Name this politician who defeated George Allen to become the next senator from Virginia.
ANSWER: Tim(othy Michael) **Kaine**

22. This artist's last finished work, which shows a mythical bird holding an easel and a wavy magic carpet going across from lower left to upper right, is *Tempered Elan*. His early works—influenced by Impressionism—include *Autumn in Bavaria*, and he wrote that "each period of culture produces an art of its own" in his book *Concerning the Spiritual In Art*. His work showing a person riding a white horse shared its name with a movement led by him and Franz Marc. Several of his works were titled *Improvisation* or *Composition* followed by a number; one of them, *Improvisation 31* is nicknamed *Sea Battle*. Name this Russian-born painter who spent his productive years in Germany and painted *The Blue Rider*.
ANSWER: Wassily (Wassilyevich) **Kandinsky**

23. The protagonist of this story objects to being called cowardly soon after saying, "We quarrel and that makes the time pass". His wife wishes they had gone to Paris or Hungary and asks "Why do you have to turn into a devil now?". He has an internal debate as to whether he or his wife is responsible for destroying his talent, since his plan to be a spy among rich people had failed. After his wife shoots a Tommie ram, Harry sees the same hyena he has seen every night for two weeks. Name this story about a writer whose leg becomes gangrenous while visiting Africa, written by Ernest Hemingway.
ANSWER: "The **Snows of Kilimanjaro**"

24. Before becoming tsar, this person won back the territories ceded in the Truce of Plussa to Sweden. Once he became Tsar, he allowed the building of Lutheran churches, and after he died his son ruled for two months before being murdered. His power increased after the death of Nikita Romanovich despite the efforts of Dionysius II, and his position was due in large part to the childless marriage of his sister Irina to Feodor the First, the unhealthy son of Ivan the Terrible. Name this ruler whose popularity eroded when he spied on his rivals and was unable to address a famine that started in 1601, and whose reign started the Time of Troubles.
ANSWER: Boris **Godunov**

25. A telescope that takes advantage of this phenomenon was developed by Gerd Binnig and Heinrich Rohrer, and this can occur with superconducting Cooper pairs at a Josephson junction. As explained by the Hartman effect, particles experiencing this can in some cases travel faster than the speed of light. George Gamow used this to explain alpha decay, which takes place even though alpha particles should be trapped in a potential well. Also known as barrier penetration, this is sometimes explained using the Heisenberg uncertainty principle. Name this phenomenon that arises when the Schrödinger equation gives a nonzero probability for an event that would never happen according to the laws of classical physics.
ANSWER: quantum **tunnel**ling [accept **barrier penetration** before it is mentioned]

26. This curve is the envelope formed by starting with a fixed circle and drawing all circles whose centers are on the fixed circle and which go through a fixed point on the fixed circle. If the value k is used to generate one of these, then its circumference is $8k$. One of these gives the largest border for the Mandelbrot set, and, similar to a cycloid, one can be generated by following a point on a circle as that circle rolls around another circle with the same radius. This is generated by the polar equation r equals k times the quantity one minus cosine theta. Name this type of limaçon [lim-uh-sawn] named for its resemblance to a heart.
ANSWER: **cardioid** [prompt on **limaçon**]

27. In one story by this writer, a woman tries to comfort herself through the belief that at birth each person gets one of the millions of available bodies. That girl, who sometimes has to hitchhike when her boyfriend runs out of gas, pretends to be a hitchhiker that he picks up. That story appears in *Laughable Loves*. One of his works tries to explain the word "Litost" and begins with Mirek being arrested for treason. One of his novels is about a man whose mistress is a painter named Sabina and whose wife is a photographer named Tereza; that work claims that life would be more serious if we could compare possible lives. Name this Czech author of *The Book of Laughter and Forgetting* and *The Unbearable Lightness of Being*.
ANSWER: Milan **Kundera**

28. This person wrote of his conviction "that the world is orderly and can be explained by a small number of natural laws" in his book on the unity of knowledge, *Consilience*. He used a term developed by Suzanne Batra to define species that have a reproductive division of labor, overlapping generations, and cooperative care of the young. He still uses that term, "eusocial," in his 2012 book *The Social Conquest of Earth*. The branch of science associated with him is based on a 1975 book that has been criticized for its genetic determinism and which attempted to explain the benefits of altruism. Name this expert on ants who wrote the book *Sociobiology*.
ANSWER: Edward O(sborne) **Wilson**

29. In this man's first opera, Salud's love for Paco causes her to crash his wedding. Gayferos initially opts to play chess rather than rescue his wife Melisendra in one opera by this composer that is narrated by a puppeteer named Pedro. A ghost disappears after the "Ritual Fire Dance" is performed by Candela in one work by this composer, who created a more famous work inspired by Pedro Alarcón. In that work, a magistrate unsuccessfully attempts to seduce the wife of an Andalusian miller. Name this Spanish composer of *Love, the Magician* and *The Three-Cornered Hat*.
ANSWER: Manuel **de Falla** (y Matheu)

30. Early in the second phase of this battle, 132 Germans were single–handedly captured without use of arms by Corporal Alvin York. Another exploit during this battle began one day earlier when nine companies of the US 77th Division were separated from the main force, forcing them to use carrier pigeons to communicate while holding out, in the "Lost Battalion" incident. The 117,000 casualties suffered by the American Expeditionary Force makes this battle that started in September 1918 the single bloodiest one in US military history. It sought to reach the rail station at Sedan [seh-daw]. Identify this last offensive of World War I, which ended with the November 11 armistice.
ANSWER: Battle of the **Argonne** Forest [accept **Meuse**-Argonne or **Maas**-Argonne Offensive/Battle]

31. The protagonist of this novel has eyes that "seemed too unusual and striking," while her sister is "so amiable and innocent-looking." They at first live with their uncle, whose "conclusions were as difficult to predict as the weather." That Uncle Arthur runs a newspaper called *The Pioneer*, and his political goals fail because he is a bad landlord. The protagonist's sister, who marries James Chettam, is Celia. Chettam's estate is called Freshitt, while much of this novel takes place on Tipton Grange. The protagonist marries a man trying to write *The Key to All Mythologies*, but he dies. Name this novel featuring the marriage of Will Ladislaw and Dorothea Brooke written by George Eliot.
ANSWER: *Middlemarch*

32. In June 2012, a single-molecule version of this experiment was published that determined the precise time needed for ejection, and it was this study that prompted Linus Pauling to begin work on nucleic acids. The results of this experiment depended on "osterizing" the culture samples, which required the use of a Waring blender to separate "ghosts" from cells. The main components under study were labeled with radioactive sulfur-35 and phosphorus-32, allowing the polymers making up T2 to be distinguished. After centrifugation, this experiment determined that viral DNA—but not bacteriophage capsids—had entered the bacterial cells. Published just a year before Watson and Crick's double helix model, name this doubly eponymous genetics experiment that proved DNA rather than protein was the hereditary material.
ANSWER: **Hershey-Chase** experiment [or **Chase-Hershey** experiment]

33. Because he further developed a method started by Anders Lindstedt to find the recurrence time it takes certain systems to return to a previous state, that time is now named for this person. That time often is relevant to his namesake maps, which are used to trace paths of particles in space. This mathematician's namesake metric is used to place objects on his disk model of hyperbolic geometry. His namesake conjecture is solved as a consequence of Thurston's geometrization conjecture and states that the three-sphere is essentially the only closed, simply connected three-dimensional manifold. Name this French mathematician whose conjecture was recently proven by Grigori Perelman, who was offered but turned down the Clay Millennium Prize.
ANSWER: (Jules) Henri **Poincaré** [pwan-kar-ay]

34. This composer referenced Mussorgsky's *Khovanshchina* in his 13th symphony and in *The Execution of Stepan Razin*. The premiere of this composer's fourth symphony was supposed to be in 1936 but took place in 1961 instead. The fourth movement of his 11th symphony, titled "Tocsin", references a folk song titled "Rage, Tyrants", while its third movement references "You Fell as Victims". That work outwardly seems to be a patriotic tribute to the year 1905, but some people have questioned whether it is actually about the events of 1956 in Hungary instead. Name this composer famously criticized in the article "Muddle Instead of Music" that appeared in *Pravda* as a reaction to his opera *Lady Macbeth of the Mtsensk District*.
ANSWER: Dmitri (Dmitriyevich) **Shostakovich**

35. The Spartan king Cleomenes prevented this person from ruling Athens immediately after the overthrow of Hippias. Soon after that, Isagoras removed members of the Alcmaeonid family—which this person belonged to—though popular resistance brought the family back. This person increased the size of the Solonian Council of Four Hundred so that each of ten tribes could have fifty representatives, and he reorganized society so the tribes were based on location rather than family. Aristotle credited this person for originating the practice of ostracism. Name this ruler about fifty years after Solon and fifty years before Pericles, the so-called father of Athenian democracy.
ANSWER: **Cleisthenes** [klay-ISS-thuh-neez]

36. It is widely believed that the name of this religion is based on one of its early heretics who was killed for preaching that a reigning caliph was the reincarnation of God. This was first practiced at the Raydan Mosque in Cairo once Hamza ibn Ali moved there, and their holy works include the Epistles of Wisdom while incorporating other religious and philosophical works. Practitioners, who do not believe in conversion and keep their teachings secret, refer to themselves as monotheists. This religion is a descendant of Ismailism, which is a branch of Shia Islam, and it dates to the 11th century. Name this group represented by a star with five colors, most of whom live in Lebanon and Syria.
ANSWER: **Druze**

37. This was the opening poem in *The Tower*, and its narrator wishes to be gathered into the "artifice of eternity". This poem begins in a place surrounded by "monuments of unaging intellect," where "an aged man is but a paltry thing". Though the beginning seems to complain of birds in the trees at their song, the end expresses a desire to "set upon a golden bough to sing". The narrator has gone to a place where his heart can be consumed by sages represented by the gold mosaic of a wall. In reality, the poet never traveled to the place mentioned in the title. Name this William Butler Yeats ["Yates"] poem beginning "that is no country for old men".
ANSWER: "__Sailing to Byzantium__"

38. This person became editor of a newspaper that merged with the *Iowa Homestead* when his father became the Secretary of Agriculture, the same job he rose to twelve years later. He also served as Secretary of Commerce, while after being fired for opposing anti-Communist policies he became the editor of *The New Republic*. As Secretary of Agriculture, he gained the nickname "The Greatest Butcher in Christendom" for a program that paid farmers to slaughter pigs, and he oversaw the creation of the first food stamp program. When he ran for vice president, his letters to Russian religious guru Nicholas Roerich were controversial, and he served one term before being replaced by Harry Truman. Name this politician who ran with Glen Taylor in the 1948 Presidential Election as a Progressive.
ANSWER: Henry A(gard) __Wallace__

39. In redox experiments, a porous cup is often substituted for this device, which is hindered by its low surface area. These devices can be made of fritted glass or by soaking chemicals such as potassium nitrate in string or paper. Potassium chloride and sodium chloride are also common chemicals used to fill these objects, which are often made with an inverted U-tube. Containing an electrolyte, these allow the flow of electrons between two containers of different chemicals. Name these connections between the half-cells in a galvanic cell.
ANSWER: __salt bridge__s [prompt on __bridge__]

40. This person wrote that the three tasks of life were to find an occupation, find a position among fellow human beings, and accommodate ourselves to the fact that there are two genders. Those ideas appeared in his work *What Life Could Mean To You*. Building on Hans Vaihinger's theory of useful fictions, he wrote about a fictional final goal which held an individual's conception of success. He believed that the purpose of therapy was to allow the patient to identify problems with his or her private life plan. He also believed that unrealistically high goals and leftover feelings of inadequacy from childhood caused people to develop an inferiority complex. Name this psychologist who theorized about the impact of birth order on style of life and wrote the book *The Practice and Theory of Individual Psychology*.
ANSWER: Alfred __Adler__

Phase II Tiebreakers
TB-II1. This season begins the week after Stir-up Sunday in the Anglican Church, and some houses mark it by making additions to a Jesse Tree. Its last few days are marked by the *O antiphons*, which are based on the names of Jesus Christ, and the *Rorate Coeli* based on the *Book of Isaiah* are sung daily during this season. It can last from 22 to 28 days depending on the year, though candles used to measure it and some popular calendars list always use 24 days. This is the first season in the Western liturgical calendar, which begins on a Sunday named for this holiday and overlaps the Eastern Orthodox Nativity Fast. Name this Christian season that leads up to Christmas.
ANSWER: __Advent__

TB-II2. This composer, inspired by the novel *Flegeljahre* [FLAY-gul-YAR-uh] by Jean Paul, wrote a piece whose name is French for "butterflies". That was his second published piece, following *Variations on the name Abegg*. In addition to his *Papillons*, he based separate song cycles on poems by Joseph Eichendorff and Heinrich Heine titled *Liederkreis*. His first symphony used themes from "Schnell und spielend", the eighth and final movement of his *Kreisleriana*, and is nicknamed *Spring*. Name this composer whose *Rhenish* Symphony was inspired by a vacation with his wife Clara.
ANSWER: Robert (Alexander) **Schumann**

TB-II3. Before his government work, this man practiced law with his second cousin, Thomas Jefferson. When serving as secretary of state, a different president handed him a letter from French Minister Jean Antoine [zhahn an-twahn] Joseph Fauchet [foh-shay] and told him to explain it. He resigned instead, and historians generally now believe that he did not solicit a bribe. That happened shortly before the signing of Pinckney's Treaty, whose negotiation this person had restarted, and after the Jay Treaty, which he had opposed. He presented Madison's Virginia Plan to the Constitutional Convention. Name this nephew of the first President of the Continental Congress, who was chosen by George Washington to be the first Attorney General.
ANSWER: Edmund **Randolph**

TB-II4. This person wrote about a widower named Murlock who lived near Cincinnati in a house with a boarded window. He also wrote about a boy aged about six years who crosses a creek before being scared by a rabbit. That boy eventually finds his burned home after trying to ride a retreating soldier like a horse. That story was placed in the collection *Tales of Soldiers and Civilians* along with a work in which the main character mistakes the ticking of his watch for a hammer striking an anvil. That man, who was caught trying to destroy a bridge during the Civil War, is Peyton Farquhar. Name this author of "Chickamauga" and "An Occurrence at Owl Creek Bridge".
ANSWER: Ambrose (Gwinnett) **Bierce**

Phase III

41. Current research is attempting to determine whether or not double-beta decay can occur without creating this particle, which would mean that these are their own antiparticles. These particles can change flavor, which is considered their oscillation. That change was verified at an observatory in Sudbury, Ontario in 2001, explaining why fewer of these were emitted by the sun than originally predicted and confirming that these objects have mass. Clyde Cowan and Fred Reines discovered the first type, and it is now known that there are three of these: tau, muon, and electron, so each of these three leptons is associated with one of the other three leptons. Name these subatomic particles unaffected by the electromagnetic or strong force, which makes them good at penetrating matter and difficult to detect.
ANSWER: **neutrino**s

42. This country's independence was gained after the reign of Mohammed ben Aarafa, who was given power by the French when they exiled to Corsica and Madagascar its future king Mohammed V. After winning the Battle of Three Kings, this country built El Badi Palace and was ruled by Ahmad al-Mansur, who captured much of the Songhai Empire. Its most populous city has the Anfa Hotel, where Henri Giraud [zhee-roh] and Charles de Gaulle shook hands at a 1943 conference where the Allies agreed to seek German unconditional surrender. Its status in 1905 strengthened the Entente Cordiale [ahn-tawnt kord-yal] during what became known as the Tangier Crisis. Name this country in northwest Africa that controls Ifni and would like to control Ceuta which, like it, is at the south end of the Strait of Gibraltar.
ANSWER: Kingdom of **Morocco** [or **Amerruk**]

43. This artist was commissioned to sculpt the statue of John Harvard in front of Harvard University, and he sculpted the massive *Statue of the Republic* that stood in front of Chicago to commemorate the 1893 World Exposition. An Emerson poem adorns the base of another work by this man, a statue in Concord, Massachusetts that depicts a Minuteman. This man created his most famous work on a site that later saw Martin Luther King, Jr.'s "I Have a Dream" speech; that project includes an inscription of the Gettysburg Address. Name this American sculptor who is responsible for the *Seated Lincoln* for Washington, D.C.'s Lincoln Memorial.
ANSWER: Daniel Chester **French**

44. In one work by this writer, Albert Stokes briefly gets away from his mother, and in another work Max meets his daughter-in-law Ruth six years after she marries his son Teddy. In addition to *A Night Out* and *The Homecoming*, he wrote a play in which Lulu delivers a package that contains a toy drum for Stanley, who lives with Meg and Petey Boles and is tormented by Goldberg and McCann. Another work involves an envelope with twelve matches and takes place in Birmingham, England. That work has two characters, and when it opens one is tying his shoes while the other reads the newspaper. Those two characters are hit men who occasionally get food orders. Name this playwright of *The Birthday Party* and *The Dumb Waiter*.
ANSWER: Harold **Pinter**

45. This writer rejected Georg Simmel's definition of a city, saying instead that it consisted of people living close together in anonymity. His work *The City* was posthumously incorporated into one of his works describing several of his ideal types, including three types of religious behavior: world-flying mysticism, world-rejecting asceticism, and inner-worldly asceticism. That combined work is *Economy and Society*. One work by this writer states that Calvinists used worldly success to determine their religious fate, leading to a belief that earning a profit was a positive religious sign, which in turn explains economic improvements in parts of Europe. Name this author of *The Protestant Ethic and the Spirit of Capitalism*.
ANSWER: Max(imilian Karl Emil) **Weber** [VEH-bur]

46. Performing this operation on a cofactor matrix generates a classical adjoint matrix. For an orthogonal matrix, this operation is equivalent to inversion. One method of least squares regression uses this operation twice along with inversion and multiplication. A dot product can be computed by applying this operation to one vector and then multiplying. This operation gives the additive inverse of a skew-symmetric matrix, and it has no effect on a symmetric matrix. Name this operation that reflects a square matrix across its main diagonal, represented by a superscript T.
ANSWER: (matrix) **transposition** [accept word forms]

47. Support for this person increased when James Graham was accused of opening his letters in the Post Office Espionage Scandal. He started a journal whose name means "Thought and Action," and used those words as a slogan when serving in a triumvirate with Carlo Armellini and Aurelio Saffi. That position dissolved when the pope supported a French invasion of Rome, so he moved to London and started the Friends of Italy. Because he wanted a republican government, he opposed the monarchy with King Victor Emmanuel set up by Camillo di Cavour. Name this activist who started the secret society known as Young Italy.
ANSWER: Giuseppe **Mazzini** [or Joseph **Mazzini**]

48. This is the only star brighter than Miaplacidus in its constellation, and it used to be considered the brightest star in Argo Navis before that constellation was broken up. It is not part of the ancient constellations because it is not visible from Athens or Rome. It has in the past been the brightest star in the night sky and is expected to be so again in the future. This star has been used in the past as a guide towards the South Pole, but it is never seen above 38 degrees North latitude. Name this star with a visual magnitude of –0.72, the brightest star in Carina and the second brightest star from Earth, after Sirius.
ANSWER: **Canopus** [prompt on **Alpha Carinae**]

49. The narrator of this poem has the knowledge of death on one side and the thought of death on the other. In this poem, a hidden gray-brown bird in a swamp warbles a song of the bleeding throat, and the narrator asks if he should warble for the dead one he loved. He also describes the sun as "Droop'd in the western sky in the night". As a coffin passes through lanes and streets with bouquets of roses, the narrator places a sprig of a different plant on it which represents the spring. Name this poem that is the first work in the "Memories of President Lincoln" Section of *Leaves of Grass* by Walt Whitman.
ANSWER: "**When Lilacs Last in the Dooryard Bloom'd**"

50. In September, this leader announced he was allowing foreign supermarket chains in his country, and in October he started allowing foreign investment in pension funds. Several members of his council of ministers resigned in October, and in July one of his former ministers became the new president. A former economics professor, this prime minister is supported by the United Progressive Alliance that appointed him in 2004, which includes his Congress Party. His birthplace of Gah is now located in Pakistan. Name this leader who replaced Atal Vajpayee with the support of Sonia Gandhi to become prime minister of India.
ANSWER: Manmohan **Singh**

51. This composer's first string quartet borrows from Bach's *Toccata and Fugue in D minor* and several hymns. Sometimes nicknamed "The Revival Service", it was written while he was a Yale undergraduate. His third symphony was premiered by his friend Lou Harrison and lasts only about twenty minutes. Its sections are titled *Old Folks Gatherin'*, *Children's Day*, and *Communion*, and the overall work is called *The Camp Meeting*. One of his works was originally paired with *Central Park in the Dark*, and another is set at Putnam's Camp in Redding, the Housatonic at Stockbridge, and Boston Common. Name this composer of *The Unanswered Question* and *Three Places in New England*.
ANSWER: Charles (Edward) **Ives**

52. This author wrote about a relationship between the daughter of the owner of Patimkin Kitchen and Bathroom Sinks and a library employee named Neil Klugman. He also wrote fiction about an affair between himself and a married Englishwoman in *Deception*, and used himself as a character in a different novel in which Charles Lindbergh wins the 1940 presidential election. In another work by this author, the protagonist claims he once thought all of his teachers were his mother in disguise, which is one of many things he tells Dr. Spielvogel. Many of his works are about the fictional author of *Carnovsky*, Nathan Zuckerman. Name this author of *Goodbye, Columbus*; *The Plot Against America*; and *Portnoy's Complaint*.
ANSWER: Philip (Milton) **Roth**

53. Examples of the type of molecule named after this person include diatomic xenon; such molecules may be held together by hydrogen bonds. The Casimir effect was discovered in the course of an attempt to measure the force named after this person. The two constants named after him are measured in liters per mole and in liter squared bars per mole squared. One of those constants is multiplied by the number of moles and subtracted from the volume in his namesake equation in order to correct for the volume of molecules, while the other one corrects for intermolecular forces. Name this Dutch scientist who improved the ideal gas law.
ANSWER: Johannes Diderik **van der Waals**

54. American troops advancing in this battle were easily targeted by enemy fire in thick jungle cover because an American observation balloon carrying Colonel Darby clearly marked the American position. General Henry Lawton and his men arrived one day late because they were held up at El Caney [KAH-nay], and Leonard Wood led the cavalry that included the Buffalo Soldiers. New American Gatling guns helped win the day in this battle; one of the rare times when infantry lacking artillery support secured an elevated position. Identify this near-disastrous battle of 1898 near Kettle Hill, which made the Rough Riders and Teddy Roosevelt into heroes.

Answer: Battle of **San Juan Hill**s [accept Battle of **San Juan Heights**]

55. An object created by this god was stolen by Neferkaptah, who committed suicide after the gods killed his wife and children; that object was later stolen from Neferkaptah's tomb by Setne Khamwas. This god also brought Tefnut home from Nubia, and he sided with Horus against Set. Worshiped at Hermopolis, he was often pictured with the head of an ibis or baboon and wrote a book of powerful spells including one that allowed people to speak to animals. This god was associated with the moon and writing and was the masculine counterpart of Maat. Name this deity who along with Anubis was in charge of judging the dead.
ANSWER: **Thoth** [or **Djeheuty**]

56. One of the reasons this scandal broke was the capture of Eugene Hasenfus after his Fairchild C-123 cargo plane was shot down. In it, the executive branch disobeyed the Boland Amendment, leading to the resignation of National Security Adviser Admiral John Poindexter. During this incident the president continued to insist that "we did not negotiate with terrorists" and acted against the wishes of Secretary of State Shultz and Secretary of Defense Weinberger. Much of the work was carried out by Lieutenant Colonel Oliver North, who diverted money to rebels fighting against the ruling Sandinistas in Nicaragua. Name this scandal during the Reagan presidency that involved selling weapons to a country headed by Ayatollah Khomeini.
ANSWER: **Iran-Contra** Affair [accept similar words in place of "Affair"; prompt on **Irangate** or **Contragate**]

57. This process is observed almost entirely in precocial species, though it has been observed in *k*-selected fish like the convict cichlid [SIK-lihd]. The influence of this process on mate selection is evident in zebra finches, whose females prefer males with head ornamentation resembling their fathers'. The failure of sandhill cranes to serve as effective surrogates to whooping cranes is explained by this process, whose key stimulus was found to be movement for the graylag geese studied by Konrad Lorenz. Zookeepers take advantage of this learning mechanism to hand-rear baby mammals, while ultralight aircraft pilots have used it to teach endangered birds to migrate. Explaining why chicks constantly follow a hen and occurring only during a brief, critical period, named this form of learning in which young animals develop a long-lasting attachment to a nearby object or individual, thereafter recognized as their "mother".
ANSWER: filial **imprint**ing [accept word forms]

58. One work by this painter shows the tomb of Sichaeus [sih-KAY-us] on its right side, across a river from his living widow. That work, set in the same place as *The Decline of the Carthaginian Empire* but at an earlier time, is *Dido Building Carthage*. He also used ancient history in his work showing Hannibal crossing the Alps during a snow storm. One work, containing vague people standing on the shore, a boat in the water, and a running hare as a black train crosses a bridge, is subtitled *The Great Western Railway*. He also painted slaves in the water after being thrown off a ship and the 1834 burning of the British Houses of Parliament. Name this artist of *Rain, Steam and Speed*.
ANSWER: J(oseph) M(allord) W(illiam) **Turner**

59. The theorem named after this person and Andrey Markov [MAR-kawf] assumes normally distributed errors to prove the validity of the method of least squares for linear regression. The integer lattice of the complex plane, or in other words the complex numbers whose real and imaginary parts are both integers, are called his namesake "integers". He developed a mapping from surfaces to the unit sphere, and surface integrals are often taken on the surfaces named for him. He is also the namesake of the method to put matrices into row echelon form, and Jordan's [YAWR-dahn'z] name is added to his when going to reduced row echelon form. Identify this mathematician and physicist who is sometimes used as the namesake of the bell curve.
ANSWER: Carl Friedrich **Gauss**

60. One character created by this author is excited when an English soldier thanks him for bringing matches. That character—who lived with his mother until the age of nine—is Yasin, who then moves in with his father, stepmother, and four half-siblings. In another work by this author, a son is expelled from his father's mansion for reading his father's will. Near the end of that book, the magician Arafa attempts to get the same will, leading to the death of the father. In that work, Gabal, Rifa'a, and Qasim have much in common with famous religious figures. The book Yasin appeared in, *Palace Walk*, was followed by *Palace of Desire* and *Sugar Street*. Name this author of *Children of Gebelawi* and the *Cairo Trilogy*.
ANSWER: Naguib **Mahfouz**

Phase III Tiebreakers
TB-III1. This book mentions the writer's childhood schoolmaster and doctor, each of whom only had one eye, and it claims that none of its subjects are harmless. It divides stimuli into the categories of external sensory, internal sensory, internal physical, and purely psychical sources. The author remembers looking into a woman's mouth and seeing "a big white patch" and "extensive whitish grey scabs" as part of Irma's injection. One of its questions is how the experience of anxiety and terror can be a means of wish fulfillment, and this book claims that its point is to provide "the royal road to a knowledge of the unconscious activities of the mind". Name this early attempt to establish a basis for psychoanalysis written by Sigmund Freud.
ANSWER: The **Interpretation of Dreams** [or Die **Traumdeutung**]

TB-III2. One example of this type of structure is Kick 'Em Jenny, which is located north of Grenada in the Caribbean Sea, while some near Indonesia form the Emperor of China–Nieuwkerk ridge. Examples of them with flat tops are called guyots, including the Bear, which is part of the New England chain southeast of Massachusetts. They are larger than sea knolls, and have much in common geologically with islands. Like oceanic trenches, the study of these is a major part of bathymetry. Name these sometimes-extinct underwater volcanoes that are not tall enough to reach the water surface.
ANSWER: **seamount** [prompt on **submarine mountain** or **underwater mountain**]

TB-III3. In an aside to her "sick soul", this character states, "So full of artless jealousy is guilt it spills itself in fearing to be spilt." When this character scatters flowers on a grave, she says, "Sweets to the sweet!" She causes her son, whom she advises not to go to Wittenberg [VIH-tun-burg], to state "Frailty, thy name is woman!". Her dying words are "The drink, the drink! I am poisoned", and her dying takes place at the end of a fencing match between her son and Laertes. Soon after the death of her husband, she marries Claudius. Name this mother of Hamlet.
ANSWER: Queen **Gertrude**