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Toss Ups:

1. In this author's *Two Upbuilding Discourses*, he argues that the relationship between an individual and God is based on faith, not on knowledge. In another book, this author included a fictional letter addressed to 'A.' That work was titled "The Aesthetic Validity of Marriage." This author asserted that not knowing that you are in despair is the most basic type of despair in (*) *The Sickness Unto Death*. In one work, this author gave four alternate versions of the biblical story of Abraham sacrificing Isaac, and suggested that infinite resignation is not the same as faith. For 10 points, name this philosopher who wrote *Fear and Trembling* and *Either/Or*.

ANSWER: Søren Aabye Kierkegaard <Leo/Ed. AS>

2. This leader began contributing to the anti-revolutionary newspaper *Kreuz-Zeitung* after entering the conservative religious social circle of the von Gerlach brothers while managing his father Alexander's estate. Frederick William IV selected this man to represent his home kingdom at the Diet of Frankfurt. In a famous speech, this leader said that the great issues of the day would not be decided by speeches and resolutions, but through (*) blood and iron. This leader's victory at the Battle of Sedan led to his empire's annexation of Alsace. This leader's editing of the Ems telegram led to the outbreak of the Franco-Prussian War. For 10, name this first chancellor of a unified German Empire, who instigated the *kulturkampf* and pursued *realpolitik*.

ANSWER: Otto von Bismarck <Taylor/Ed. PT>

3. AES, which detects the emission of these particles, and XPS are both used to perform surface analysis, but AES has a higher spatial resolution. Planck re-analyzed the results of an experiment that measured the mass of these particles, which was originally thought to disprove special relativity by Kaufmann. The filling of an inner-shell vacancy results in the release one of these particles in the (*) Auger (aww-zhay) effect. These particles were diffracted from a crystal made of nickel in the Davisson-Germer experiment, which demonstrated the wave nature of these particles. The charge of these particles was determined by Millikan's oil drop experiment. For 10 points, J.J. Thomson discovered what negatively charged particles?

ANSWER: electrons <Leo/Ed. JS>

4. During one of these conflicts, about 200 prisoners were put to death after failing to answer yes to the question "have you in the present war done any service to" one side. During one of these conflicts, the general Tolmides failed to retake a revolting city at the Battle of Coronea. After withdrawing from (*) Boeotia, one side in one of these conflicts defeated the other at Tanagra. The last of these conflicts ended with Lysander crushing one side's fleet at the Battle of Aegospotami. Thucydides described a famous funeral oration given by Pericles for those who died in one of these conflicts. For 10 points, name this set of two conflicts in ancient Greece, fought between the Athens-led Delian League and a namesake league led by Sparta.

ANSWER: Peloponnesian Wars [accept First or Second Peloponnesian War] (the second clue refers to the Theban and Spartan killing of prisoner after the capture of Plataea) <Taylor/Ed. PT>

5. A contemporary poet with this surname mentions "a chameleon inside, starving" in her poem "The President Has Never Said the Word 'Black'" from her collection *There Are More Beautiful Things Than Beyoncé*. A different writer with this surname notes that "Guns aren't lawful / Nooses give" in her humorous suicide poem (*) "Résumé." That writer with this surname was a founding member of the Algonquin Round Table known for her witty writing in *The New Yorker*. In *Life of Pi*, the tiger who inhabits the lifeboat has this surname. For 10 points, give this surname of the poets Morgan and Dorothy, which also is the surname of the secret identity of Spiderman.

ANSWER: Parker <Taylor/Ed. TH>

6. Marguerite Perey discovered an element of this group by using skills she developed as Marie Curie's assistant that was originally called actinium K. Reacting an element of this group with alkyl halides produces non-Grignard reagents used in the first step of the synthesis of Gilman reagents. The Zeeman effect was first observed in the splitting of an element of this group's D-lines, also called that element's "doublet." Carbon dioxide and ammonia are used in the (*) Solvay process to produce the bicarbonate of an element of this group, and the lightest element in this group is used to treat bipolar disorder. This group includes the two least electronegative elements, francium and cesium. For 10 points, name this group of elements, located in the first column of the periodic table.

ANSWER: alkali metals [accept group 1 before "first", prompt after; do not accept or prompt on "alkali earth metal"] <Leo/Ed. JS>

7. The Libertarian candidate in this election year had earlier become the first elector to vote for a ticket including a woman by voting for the Libertarian ticket of John Hospers and Theodora Nathan. A candidate in this election year dropped in the polls after admitting in a Playboy interview to have "lust in his heart" for another woman. This election year saw the first Vice Presidential debate, where it was said that all wars were "Democrat Wars" by Bob (*) Dole. The Republican incumbent faced opposition from his own party in this election year after the fall of Saigon and pardoning Richard Nixon. For 10 points, give the election year in which Jimmy Carter defeated Gerald Ford.

ANSWER: Election of 1976 [prompt on 76] <Peter/Ed. PT>

8. The teachings of one leader of this faith were divided into twelve Angas and fourteen Purvas at the council of Patliputra after centuries of oral tradition. A temple of this religion at Pavapuri contains footmarks said to be from a figure important to this religion. Rishabha is the first of (*) 24 legendary leaders of this faith, the last of whom was a contemporary of the Buddha. One of the two main sects of this religion holds that women cannot attain enlightenment and that one should own no possessions including clothes, which is why the Digambara sect goes naked. The doctrine of non-harm, or *ahimsa*, is central to—for 10 points—what religion of the Indian subcontinent?

ANSWER: Jainism <Taylor/Ed. TH>

9. A character in this play describes visiting a "Turkish pavilion" which turns out to be an outhouse. Another character in this play describes a dream in which she climbs a pillar but is unable to go back down, to which a man responds by discussing his dream of retrieving golden eggs from a tree. In this play, a woman insists on travelling with a pet (*) bird and claims she was "betrayed" by her pet dog. Several characters in this play discuss their dream of opening a resort at Lake Como. The cook Christine is the fiancé of the valet Jean in this play, which ends with the title character committing suicide with a razor. For 10 points, name this play by August Strindberg.

ANSWER: Miss Julie [or Froken Julie] <Alex/Ed. AS>

10. This composer's first piano concerto was not performed for twelve years after its premiere because of critic Eduard Hanslick dubbing it the "Triangle Concerto" for its prominent use of that instrument. That E flat major piano concerto by this composer supposedly had the words "none of you understand this haha" set to the orchestral introduction. The Faust legend inspired both this composer's (*) *Faust Symphony* and his set of four *Mephisto Waltzes*. This virtuoso pianist's electric stage presence led to a namesake "mania" for his music across 19th century Europe. For 10 points, name this Hungarian composer known for his *Dante Symphony* and his *Hungarian Rhapsodies*.

ANSWER: Franz Liszt <Taylor/Ed. TH>

11. A novel by this author focuses on the failed businessman Axel Heyst and his Chinese assistant Wang who both perish on an Indonesian island when three desperados invade their estate seeking treasure. This author of *Victory* also wrote a story in which an unnamed sea captain hides the castaway Leggatt, who flees another ship after murdering a man while in the Gulf of Siam. In a novella by this author, a Russian (*) harlequin greets the protagonist at the end of a river journey, which is narrated in a frame story from the deck of the *Nellie*. That novella by this author is often published with his story “The Secret Sharer” and describes Marlow’s journey to find the insane ivory trader Kurtz. For 10 points, name this Polish-British author who wrote *Heart of Darkness*.

ANSWER: Joseph Conrad [or Józef Teodor Konrad Korzeniowski] <Taylor/Ed. AS>

12. Acid-fast stains like the Kinyoun stain and Ziehl-Neelsen stain are used to detect the causative agent of this disease which can also be detected by interferon gamma release assays. Theodor Langhans first discovered his namesake giant cells while studying the granulomas associated with this disease. Ghon’s complex is caused by this disease, which the (*) BCG vaccine protects against. One method of diagnosing this disease involves a namesake instrument which has four to six needles arranged in a circle. The tine test has been replaced by the PPD test for this disease, which can be treated with isoniazid. Bacteria in the genus *Mycobacterium* infect the lungs in—for 10 points—what disease which is also called consumption?

ANSWER: tuberculosis [accept TB; accept consumption before mentioned] <Leo/Ed. JS>

13. One work from this nation recounts how Aunt Jacinta died the week before and notes that it is “raining like never before” in the section “We’re very poor.” That work, *Burning Plain*, was followed by a novel narrated by Juan Preciado set primarily in a ghost town. A novelist from this country wrote about Felipe Montero in (*) *Aura* and described the deathbed confessions of a corrupt tycoon in another novel. That novelist recounted the disappearance of Ambrose Bierce during this nation’s revolution in *The Old Gringo*. For 10 points, name this home nation of authors Juan Rulfo and Carlos Fuentes.

ANSWER: México <Peter/Ed. AS>

14. To account for their bizarre presence in medieval illuminated manuscripts fighting knights, scholar Lilian Randall claimed that these animals represented the Lombards in those artworks. The disease Schistosomiasis is caused by flatworms whose vector is these animals. The practice of raising these animals as food is known as heliciculture. The giant triton type of this animal can grow up to a foot and a half long and feeds on starfish. Hermaphroditic examples of these animals may use (*) love darts to mate. The *murex* genus of these animals was used by Phoenicians to make royal purple dye. For 10 points, name these shelled gastropods which are eaten in French cuisine as *escargot*.

ANSWER: snails [accept gastropods until mentioned; prompt on mollusk] <Taylor/Ed. TH>

15. Philip II decreed that this substance was essential for Andean natives to consume but should not be used for religious purposes. Moche pottery has been found depicting native people with a cheek bulge consuming this substance. In the 2000s, this crop was targeted via aerial fumigation in an initiative in which Andres Pastrana Arango teamed up with Bill Clinton. That initiative, Plan (*) Colombia, intended to coerce farmers into not producing this drug for FARC. For 10 points, name this narcotic whose freebase form, crack, created an epidemic in the U.S. during the the 1980s.

ANSWER: cocaine [or coca plant] <Peter/Ed. PT>

16. The Bretschneider spectrum improves upon the the ability of the Pierson-Moskowitz spectrum to model the power spectral density of these phenomena, and an expansion in terms of steepness is used in an model of these phenomena developed by Stokes. Groynes have been shown to dissipate the energy of these phenomena that have a trochoid shape. The longer the (*) fetch is, the more powerful these phenomena become. The difference in the amount of circular motion of particles at different depths in these phenomena causes a small surface current, but ideal forms of these phenomena don’t displace particles at all. Wind creates whitecaps by blowing the top off of—for 10 points—what phenomena whose height and period determine the sea state?

ANSWER: ocean waves <Jonathen/Ed. JS>

17. Johann Otto von Spreckelsen won a 1982 contest to design a monument in this city, meant to commemorate humanitarian ideals rather than military victories, which resembles a hollow cube. A different building in this city which houses a public information library and a modern art museum was designed by Richard Rogers and Renzo Piano, and exemplifies the high-tech architecture movement. (*) Shakespeare and Company bookstore lies near a cathedral in this city that features sculptures of gargoyles and chimeras which act as column support. The tallest structure in this city is an iron lattice tower which was constructed for the 1899 World's Fair. For 10 points, name this European city that features Pompidou Center and the Eiffel Tower.

ANSWER: Paris, France <Taylor/Ed. TH>

18. In one poem, this poet declares “bless my beard / they aye shall be / my beloved Trinity” referring to his demand for “women, wine, and snuff.” The speaker of one of this poet’s poems says “I see a lily on thy brow / with anguish moist and fever dew,” suggesting that a knight’s vision of a “fairy’s child” might be a hallucination. The title deity asks “Saturn is fallen, am I too to fall?” in this poet’s abandoned retelling of the Titanomachia. This poet of (*) “Hyperion” penned a ballad that begins “O what can ail thee, knight-at-arms / Alone and palely loitering,” and he wrote that “Beauty is truth, truth beauty” in one of his “Great Odes” of 1819. For 10 points, name this British Romantic poet of “La Belle Dame Sans Merci” and “Ode on a Grecian Urn.”

ANSWER: John Keats <Peter/Ed. AS>

19. An essay by Clifford Geertz opens by stating that this discipline is “notoriously hard to talk about” and is titled for “[this discipline] as a Cultural System.” It’s not culture, but an important work in the anthropology of this discipline is a Claude Levi-Strauss book titled for the primitive form of this discipline. Another work about this discipline discusses how the products of this discipline have lost their (*) “aura” due to mass mechanization. For 10 points, name this discipline about which Walter Benjamin wrote “in the Age of Mechanical Reproduction” that includes production of works like sculptures and paintings.

ANSWER: art [accept Art as a Cultural System; accept Primitive Art; accept *The Work of Art in the Age of Mechanical Reproduction*] <Alex/Ed. AS>

20. In one painting, this artist depicted a white model as black and claimed the model was his family’s maid Betty Hammond to hide that model’s identity. This artist of *Barracoon* created a series which contains a painting depicting a nude woman who appears to be floating against a solid black background and another which depicts the same woman wearing a green overcoat with braided hair. That series, containing the paintings *Black Velvet* and *The Prussian*, was purchased by Leonard Andrews in 1986. In addition to (*) secretly painting his neighbor Helga Testorf, this artist created a painting depicting a girl dressed in pink in a field gazing up towards a farmhouse. For 10 points, name this American Regionalist painter of *Christina’s World*.

ANSWER: Andrew Wyeth <Chandler/Ed. TH>

Bonuses:

1. For 10 points each, identify these authors of Gothic novels:

[10] A helmet falls from the sky and kills Conrad in this author's *The Castle of Otranto*, which is often considered the first Gothic novel.

ANSWER: Horace **Walpole**

[10] A young scientist creates a disturbing monster in this author's novel *Frankenstein*.

ANSWER: Mary **Shelley**

[10] The brooding Mrs. Danvers haunts the daily life of the second Mrs. de Winter at Manderley in this author's best-known novel. This author also wrote the short story "The Birds," which Hitchcock adapted into a film.

ANSWER: Daphne **du Maurier** <Alex/Ed. AS>

2. The indistinguishability of particles, which resolves the Gibbs paradox, is used in the derivation of this equation. For ten points each:

[10] Name this doubly eponymous equation that calculates the entropy for a monatomic ideal gas. Its unusual five halves term is the result of the Stirling approximation used in its derivation.

ANSWER: **Sackur-Tetrode** equation [do not prompt on partial answer]

[10] Because they only have one microstate, the entropy of these systems is classically zero, which contradicts with observations. In string theory, the fuzzball construction is used to give a quantum description of these entities.

ANSWER: **black holes**

[10] One version of the third law of thermodynamics states that at this temperature, the entropy is zero for a perfect crystal. This temperature is equal to zero Kelvin.

ANSWER: **absolute zero** [accept **zero** degrees **Rankine**; accept **-273.15** degrees **Celsius**; accept **-459.67** degrees **Fahrenheit** or **-460** degrees **Fahrenheit**] <Leo/Ed. JS>

3. A Titian painting in which Venus covers her left breast features several putti holding up one of these objects to her right. For 10 points each:

[10] Name this object that appears hung on the back wall in Jan Van Eyck's *Arnolfini Wedding*.

ANSWER: **mirror**

[10] This mannerist artist painted the circular *Self-portrait in a Convex Mirror*. He is also known for painting an elongated baby Christ in *Madonna with the Long Neck*.

ANSWER: **Parmigianino** [or Girolamo Francesco Maria **Mazzola**]

[10] A mirror reflects the central figures in this artist's *Mother Combing Child's Hair*. This artist often painted mothers and children in works like *The Boating Party* and *The Child's Bath*.

ANSWER: Mary **Cassatt** <Taylor/Ed. TH>

4. In the 2017 NBA Draft, the Orlando Magic selected Jonathan Isaac in the first round, who played for this university. For ten points each:

[10] Name this school that won the 1993 Orange Bowl while being led by quarterback Charlie Ward. Both Eagles defensive end Timmy Jernigan and Vikings cornerback Xavier Rhodes played for this school.

ANSWER: **Florida State** University [accept **FSU**; accept Florida State **Seminoles**]

[10] After winning the Heisman Trophy in 1993, Charlie Ward was drafted into the NBA by this team in 1994. This NBA team drafted Kristaps Porzingis in 2015 and plays their home games at Madison Square Garden.

ANSWER: **New York Knicks** [accept either underlined portion]

[10] Former FSU player Sam Cassell led this team to the Western Conference Finals in 2004 alongside Latrell Sprewell and Kevin Garnett. This team traded for Jimmy Butler from the Bulls in the 2017 offseason.

ANSWER: **Minnesota Timberwolves** [accept either underlined portion] <Leo/Ed. TH>

5. A Carl Sandburg poem about this thing exclaims “Pile the bodies high at Austerlitz and Waterloo / shovel them under and let me work.” For 10 points each:

[10] Name this thing described in another poem as a “uniform hieroglyphic” and “Darker than the colorless beards of old men.” In that poem, this thing is “alike in broad zones and narrow zones” and “among black folks as among white.”

ANSWER: **grass**

[10] Those descriptions of grass occur in this 52 section poem which comprises a large portion of the collection *Leaves of Grass*. Another section of this poem describes a voyeuristic “29th bather” who watches a bunch of guys swimming.

ANSWER: “**Song of Myself**”

[10] “Song of Myself” is by this bearded American poet who also wrote “I Sing the Body Electric.”

ANSWER: Walt **Whitman** <Taylor/Ed. AS>

6. An agrarian revolution was titled after people with this color eyebrows and targeted the Wang Mang led Xin Dynasty, beginning in Shandong. For 10 points each:

[10] Name this color which also describes the Turbans of a White Lotus influenced rebellion from the 14th century.

ANSWER: **red** [Accept **Red Eyebrows** and **Red Turbans**]

[10] Another revolution was this 2nd century rebellion led by Zhang Daoling which ended up creating a theocratic state in what is now modern day Sichuan.

ANSWER: **Five Pecks of Rice** [or **Five Grains of Rice** or **Way of the Celestial Masters** or **Wu Dou Mi Dao** or **Zheng Yi Dao** or **Tian Shi Dao** or **Mi Wu** or **Mi Zai** or **Mi Dao**]

[10] The Five Pecks of Rice movement created a theocratic state led by Celestial Masters in the Hanzhong valley which was absorbed by the Kingdom Wei during this tumultuous Chinese period which followed the fall of the Eastern Han.

ANSWER: **Three Kingdoms** Period <Peter/Ed. PT>

7. Lab students develop a scheme for this technique which consists of a sequence of reagents to add in a specific order so that they can identify the compounds or elements present in a given sample. For 10 points each:

[10] Name this technique performed by using a series of precipitations and separations of phases. In this technique, hydrochloric acid is typically used to precipitate group I cations; lead (II) chloride can be separated from the other chlorides in that precipitate by dissolving it in hot water.

ANSWER: **qualitative analysis** [prompt on **QA**; do not accept or prompt on “quantitative analysis”]

[10] This simple test that burns a chemical and determines its color is sometimes used to confirm the results of qualitative analysis. Sodium burns yellow in this test, while strontium burns a crimson color.

ANSWER: **flame** test

[10] These devices are used in qualitative analysis to separate precipitates into pellets, while the supernatant is decanted. Gernot Zippe developed one of these devices used to separate chemical isotopes.

ANSWER: **centrifuges** [accept Zippe-type **centrifuges**] <Jonathen/Ed. JS>

8. If a tree is planted a day before this day, then it is considered to be a year old the next day. For 10 points:

[10] Name this Jewish “New Year for Trees”, developed by rabbis to keep track of when it is proper to harvest fruit. In more recent years, this holiday has gained a more environmentalist bend and often sees observants planting trees or raising money for planting efforts in Israel.

ANSWER: **Tu B'Shevat** [or **15 Shevat** or the **15th** day of **Shevat**; prompt on **Jewish Arbor Day**]

[10] Tu B'Shevat sometimes features a Seder meal, which is more often associated with this seven or eight day festival which celebrates the Jewish People's liberation from Egypt.

ANSWER: **Passover** [or **15 Nissan** or the **15th** day of **Nissan**; accept **Pesach** or **Pesakh**]

[10] Though the date of Tu B'Shevat does not come from the Torah, its origin is traced to a passage in this third book of the Torah which discusses not eating from fruit trees for four years after they are planted. This book follows Exodus.

ANSWER: **Leviticus** <Taylor/Ed. TH>

9. This man coined the term “stream of consciousness” in his *Principles of Psychology*. For 10 points each:

[10] Name this philosopher who described “A New Name for Some Old Ways of Thinking” in his book *Pragmatism*.

ANSWER: William **James**

[10] In *Pragmatism*, James explains that it does not make a difference whether a man is going around a tree or around one of these animals that is also circling the tree.

ANSWER: a **squirrel**

[10] This other animal is also the subject of a James quote. James claimed we do not run away from one of these animals because we are scared, but we are scared because we run away from this animal.

ANSWER: **bear** <Alex/Ed. AS>

10. A monohybrid cross of a (*read slowly*) heterozygous dominant organism with a homozygous recessive organism produces offspring with a genotypic ratio equal to this value in its simplest form. For 10 points each:

[10] Name this value that the sex ratio has if an evolutionary stable strategy is adopted. Fisher’s principle predicts that the sex ratio will have this value because of equal investment from both sexes.

ANSWER: **1:1** [or **one-to-one**; accept **fifty-fifty** or **50:50**; accept any ratio of **two equal numbers**]

[10] W.D. Hamilton proposed the theory of local mate competition which predicts that the sex ratio will be biased towards this sex. Eggs are produced by this biological sex that, in humans, has two X chromosomes.

ANSWER: **female**

[10] Differences in these features between females and males are called sexual dimorphisms. These features give an organism an advantage over rivals in sexual selection, but are not involved in reproduction.

ANSWER: **secondary sex characteristics** [accept **sexual** or word forms for **sex**] <Jonathen/Ed. JS>

11. This playwright made memory “a weapon” in plays such as *Landscape* and *No Man’s Land*. For 10 points each:

[10] Name this English playwright who wrote about Stanley Webber, a piano player in a seaside town who is visited by two strangers during a certain event.

ANSWER: Harold **Pinter**

[10] In this Pinter play two hitmen are waiting in a basement to receive an assignment while communicating with others through the “speaking tube” of the title conveyance.

ANSWER: *The Dumb Waiter*

[10] Pinter penned the screenplay adaptation of this author’s unfinished novel, *The Last Tycoon*. This author’s character Nicole Diver in *Tender is the Night* is thought to be based on his wife Zelda.

ANSWER: F. Scott **Fitzgerald** <Peter/Ed. AS>

12. This dynasty would launch an invasion from Al-Andalus in France but would be defeated by Charles Martel at the Battle of Tours. For 10 points each:

[10] Name this second caliphate, which followed the Rashidun. This caliphate was centered on Damascus and gave way to another dynasty during the Abbasid Revolution.

ANSWER: **Umayyad** Caliphate

[10] The Umayyad Caliphate originally conquered most of the Iberian Peninsula save this kingdom which served as a refuge for impoverished Catholic nobles. This kingdom centered on Oviedo was founded by Pelayo and would become the Kingdom of Leon in the 10th century.

ANSWER: Kingdom of **Asturias**

[10] In modern times, this Spanish General put down a Syndicalist revolt in Asturias in the lead up to the Spanish Civil War. This dictator defeated the Republican forces of Manuel Azaña in that civil war and ruled Spain for forty years.

ANSWER: Francisco **Franco** <Peter/Ed. PT>

13. Answer some question about the Ennead. No, not the poem by Virgil, but the Egyptian pantheon of Heliopolis, for the stated number of points:

[10] The progenitor of the whole pantheon is this sun god, who fathered the husband-wife and brother-sister pair Shu and Tefnut from a masturbation session.

ANSWER: **Ra** [accept **Re**, or **Khepri**, or **Amun** or **Atum** or **Amen-Ra** or **Amun-Re**]

[5/5] Shu and Tefnut produced this other husband-wife, brother-sister pair. One is the spirit of life and the other is the great mother goddess. They were separated by Shu to become the star-filled heavens and the earth respectively. Name either for five points, or both for 10.

ANSWER: **Geb** and **Nut**

[10] Geb and Nut produced another two husband-wife, brother-sister pairs. Name both members of either pair.

ANSWER: **Osiris and Isis** OR **Set and Nephthys** [accept **Seth** for **Set**; do not accept the wrong matchings of the pairs, such as “Isis and Set”] <Taylor/Ed. TH>

14. The composer disliked being forced to end performances with this movement to make it a “happy ending,” since, according to him, “in the real world the end is not happy at all.” For 10 points each:

[10] Name this part of a larger work, a melody of which its composer adapted into the hymn “Thaxted.” In the aforementioned larger piece, this movement precedes a movement subtitled “The Bringer of Old Age.”

ANSWER: “**Jupiter**, the Bringer of Jollity”

[10] “Jupiter, the Bringer of Jollity” is a movement in this piece by Gustav Holst. A rhythmic 5/4 ostinato opens its first movement, “Mars, the Bringer of War.”

ANSWER: *The **Planets***, Op. 32

[10] “Neptune, the Mystic” closes with one of these ensembles being placed in an adjoining room in order to achieve a fade-out effect. One of these ensembles is an integral part of Ralph Vaughan Williams’ first symphony.

ANSWER: (women's) **choir** [accept **chorus** or group of **singers**] <Yonathan/Ed. TH>

15. Coase’s theorem states that types of these phenomena can be avoided if property rights are well defined. For 10 points each:

[10] Name these costs or benefits that affect parts of society that are not involved in an economic transaction. Pollution is often given as a “negative” example of them.

ANSWER: **externalities** [accept negative **externalities**]

[10] Traditionally, negative externalities can be “internalized” using one of these entities named for Arthur Pigou. These entities can be classified as progressive, regressive and proportional.

ANSWER: **taxes** [accept Pigou(vian), progressive, regressive, or proportional **taxes**]

[10] Given sufficiently low transaction costs, Coase’s theorem states that bargaining will result in this sort of outcome, in which no reallocation of resources results in somebody being better off without making somebody else worse off. It is named for an Italian economist.

ANSWER: **Pareto efficiency** [accept **Pareto optimality** or word forms of either answer] <Yonathan/Ed. AS>

16. The “progressive” branch of this musical genre is exemplified by groups like Cadillac Sky and Barefoot, for 10 points each:

[10] Name this traditional style of American folk music that usually employs fiddle, banjo, and acoustic guitar. This style of music is associated with Appalachia and particularly Kentucky, whose state nickname is the same as this genre.

ANSWER: **bluegrass**

[10] Some bluegrass ensembles employ this small eight-stringed instrument that is tuned the same as a violin. Bill Monroe, who is called the father of bluegrass, played this instrument.

ANSWER: **mandolin**

[10] A prominent contemporary mandolin player is this former member of Nickel Creek and the Punch Brothers. This man has also played in the Silk Road ensemble with Yo-Yo Ma and appears on the NPR roots music show “A Prairie Home Companion.”

ANSWER: Chris **Thile** <Taylor/Ed. TH>

17. This conflict began when a delegation of Natives in the so-called “British Band” were attacked by a militia at Stillman’s Run. For 10 points each:

[10] Name this conflict between a chief of the Sauk people and the United States over disputed territory ceded in the Treaty of St. Louis.

ANSWER: **Black Hawk** War

[10] As a Colonel in the Black Hawk War, this man was under the command of General Henry Atkinson and resisted Jefferson Davis’ attempts to woo his daughter during that period. This victor at the battle of Palo Alto later died after drinking an excessive amount of iced milk and mixed fruits at an 1850 presidential fundraiser.

ANSWER: Zachary **Taylor**

[10] This other man saw his only service in a war as a militia captain during the Black Hawk War. This attorney later defeated men like Stephen Douglas and John Bell in the Election of 1860.

ANSWER: Abraham **Lincoln** <Peter/Ed. PT>

18. An oft-used software library for performing this operation is called the “Fastest” one of these operations “in the West.” For ten points each:

[10] Name this operation that transforms a function in the time domain into a function in the frequency domain. This operation is the indefinite integral of a function times the exponential of negative two pi i t.

ANSWER: **Fourier** transform [accept **fast Fourier** transform; accept **FFT**; do NOT accept “Fourier series”]

[10] Two answers required. Fourier transforms are used to find the coefficients of a Fourier series, which expresses any function as a sum of these two functions. These two functions are defined as opposite over hypotenuse and adjacent over hypotenuse for a right triangle.

ANSWER: **sine** and **cosine** [accept them in any order; accept **sin** and **cos**]

[10] Plancherel's theorem states that the Fourier transform is a unitary operator on the space of functions that have this property. A function has this property if the integral of the square of its modulus is finite.

ANSWER: **square integrable** [accept **square summable**] <Jonathen/Ed. JS>

19. This man exposed the Pisonian conspiracy while serving as advisor to Nero. For 10 points each:

[10] Name this emperor who took power after the assassination of Domitian, making him the first Roman emperor elected by the Senate. He was the first of the Five Good Emperors.

ANSWER: **Nerva**

[10] This Roman emperor defeated the Parthian Empire during his reign. He was the last of the five good emperors and is known for writing the Stoic treatise *Meditations*.

ANSWER: **Marcus Aurelius**

[10] This historian described the rule of the “Five good emperors” as being “under the guidance of wisdom and virtue.” He wrote *The History of the Decline and Fall of the Roman Empire*.

ANSWER: Edward **Gibbon** <Leo/Ed. PT>

20. In this story, a “harrowing machine” is used to inscribe the words “be just” on a criminal. For 10 points each:

[10] Name this story in which The Officer operates a torture machine despite the opposition of The Commandant.

ANSWER: “**In the Penal Colony**”

[10] “In the Penal Colony” is a work by this author of “The Metamorphosis.”

ANSWER: Franz **Kafka**

[10] This protagonist of “The Metamorphosis” dreams of sending his sister to study at a violin conservatory, but dies when an apple is lodged in his back.

ANSWER: **Gregor Samsa** [accept either name] <Alex/Ed. AS>