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Toss Ups:

1. Preliminary sketches for this painting were supposedly made on the tops of its artist's father's cigar boxes. This painting's artist chose to stretch its canvas to further utilize his technique of blending complementary colors. In the background of this painting two identical soldiers stand side by side, and a man in a brown suit and top hat can be seen on this painting's left carrying a cane. A man on this painting's left is lying down and wearing a (*) sleeveless shirt while smoking a pipe. This painting's setting is a park on the Seine. A woman on this painting's right can be seen holding an umbrella and walking a monkey on a leash. For 10 points, name this Pointillist masterpiece by Georges Seurat.

Answer: A Sunday Afternoon On the Island of La Grande Jatte [accept A Sunday On La Grande Jatte; prompt on Sunday Afternoon; accept Un dimanche après-midi à l'Île de la Grande Jatte] <Chandler/Ed. TH>

2. The First "Lord" of this city may have been poisoned by an Emir of Caesarea, though Arabic historian Ibn al-Qalanisi claimed he was simply struck by an arrow at a siege in his *Continuation of the Chronicle of Damascus*. That man, Godfrey, would be succeeded as ruler of this city by a king who had his camp blockaded by Alexios I Komnenos. The (*) Knights Templar began in the 12th century with the purpose to guide and protect pilgrimages to this city's namesake kingdom. After recapturing much of the Holy Land following the Battle of Hattin, Saladin sieged this holy city after finding success by weakening Herod's Gate. For 10 points, name this holiest city in both Judaism and Christianity which is the modern capital of Israel.

ANSWER: Jerusalem [Accept Yerushalayim] <Peter/Ed. PT>

3. This thinker defended the concept of neural monism with the example of a British postal worker who organizes letters alphabetically based on mental faculties and geographically based on physical faculties. In one work, this thinker claimed that the theories of Alexius Meinong and Gottliebe Frege violated the law of the excluded middle. This author of (*) "On Denoting" countered arguments for the existence of god through his thought experiment involving a teapot in outer space. For 10 points, name this author of "Why I am Not a Christian" who co-authored *Principia Mathematica* with Alfred North Whitehead.

ANSWER: Bertrand Russell <Alex/Ed. AS>

4. In the Lindemann mechanism for unimolecular reactions, this quantity is mixed because this quantity takes on different values in different conditions. This quantity is identified with the slope of a ln-ln plot in the differential method for finding it, while using an excess of one reagent and measuring the effect of the other reagent is used to determine this quantity in a technique called the method of (*) isolation or the method of flooding. If this quantity equals two, then the plot of one over reactant concentration versus time will be linear. For 10 points, give this quantity that is defined as the exponent to which a reactant concentration is raised in a rate law.

ANSWER: reaction order [or order of reaction] <Jonathen/Ed. JS>

5. In a work by this author, a telegraphist becomes invested in a love affair between Captain Everard and Lady Bradeen. The poor civil servant Vanderbank tries to propose to Nanda throughout much of the narrative of this author's *The Awkward Age*. In a novella by this author, Frederick Winterbourne attempts to break up the title girl's engagements with Giovanelli, but fails, after which she dies of (*) "Roman Fever." In another of this author's works, Mrs. Grose, the housekeeper, is told by a governess that the kids may be seeing the ghosts of her predecessor, Miss Jessel. For 10 points, name this American author of *Daisy Miller* and *The Turn of the Screw*.

ANSWER: Henry James <Peter/Ed. AS>

6. In his opus 60, Matteo Carcassi composed 25 of this type of piece for solo guitar. John Cage composed sets of these pieces named for the Greek gods Auster and Boreus. A theme by Baron von Fricken provided the main melodic idea for a set of “Symphonic” versions of this type of piece composed by Robert Schumann. Winter Wind and (*) Revolutionary are among the many examples of this type of piece composed by Frederic Chopin. Franz Liszt composed a set of notoriously difficult Transcendental examples of these pieces. For 10 points, name this didactic musical form intended to train students at a particular musical skill.

ANSWER: etudes [or studies] <Taylor/Ed. TH>

7. The Sellmeier equation improves upon Cauchy’s empirical equation for calculating this quantity. Although this quantity generally increases as frequency increases, that behavior reverses near the resonance frequency in a phenomenon called anomalous dispersion. To account for attenuation, an imaginary extinction coefficient can be added to this quantity. The arctangent of the ratio of two values of this quantity gives (*) Brewster’s angle, and metamaterials possess a negative value for this quantity. It’s not velocity or wavelength, but the ratio of two values of this quantity equals the ratio of sines of the two incident angles. For 10 points, name this quantity defined as the ratio of the speed of light in a medium to the speed of light in a vacuum, represented as the letter *n*.

ANSWER: index of refraction [accept refractive index] <Leo/Ed. JS>

8. The “edge” type of these entities was theorized by Joel Garreau in a work subtitled *Life on the New Frontier*. Charles Read and Ebenezer Howard were inspired by Edward Bellamy’s *Looking Backward* to found a movement concerning these entities dedicated to designing their “garden” type. Lewis (*) Mumford argued for an “organic” one of these in which technology harmonizes with nature in a work titled for one of these things “in History.” The “Death and Life of Great American” examples of these things is the best known work of Jane Jacobs, who primarily studied these things. Suburbs generally surround, for 10 points, what entities laid out by urban planners, examples of which include Tokyo and Chicago?

ANSWER: cities [or city; accept Edge Cities or Edge City; accept Garden City; accept *The City in History*; accept *The Death and Life of Great American Cities*] <Alex/Ed. AS>

9. The rain used in the frame story of this film was darkened with ink to make it more visible, and its director broke cinematic convention by pointing the camera directly in the sun at several points. A character in this film is impressed that a man crosses swords 23 times with him in a duel. A character in this film notes that he was foolish to leave behind a pearl-studded (*) dagger. A crime committed by the bandit Tajomaru is the subject of this film, and differing accounts of that crime are presented before a court. A samurai’s murder is the subject of—for 10 points—what film directed by Akira Kurosawa, which was based on the story “In a Grove” by Akutagawa?

ANSWER: Rashomon <Alex/Ed. TH>

10. A religious sect that developed in this country reveres Esperanto creator L. L. Zamenhof as a god. A cenotaph called the *Great Peace Prayer Tower* was built in this country by a religious group from here called the Church of Perfect Liberty. A doomsday cult from this country split into sects called Aleph and Circle of Light after performing a (*) sarin gas attack in the subway system of this nation’s capital. Persecuted Christians in this country were often made to step on the Fumi-e image of Jesus as a form of apostasy. A controversial religious site in this country lists the names of 1,068 war criminals, and this nation’s emperor was forced to step down as the leader of its largest religion after its defeat in World War II. For 10 points, kami spirits are venerated in what country, the birthplace of Shinto?

ANSWER: Japan or Nippon <Taylor/Ed. TH>

11. The residence time of these ecosystems can be used to calculate their return coefficient. Very shallow sills lead to poor exchange and anoxic conditions at the bottom of the fjord type of these ecosystems. Constant density lines are practically vertical when these ecosystems have well mixed water columns. When barrier islands or sand spits grow large enough in a tectonically stable area, the (*) bar-built type of these ecosystems is formed. They're not tide pools, but euryhaline species can inhabit these ecosystems because they tolerate a wide range of salinities. Salt marshes are often found near these ecosystems exemplified by Tampa Bay and Chesapeake Bay. For 10 points, name these aquatic ecosystems found where freshwater and saltwater mix.

ANSWER: estuaries [accept estuary; prompt on lagoon] <Jonathen/Ed. JS>

12. In a story by this author, the old painter Frenhofer applies some finishing touches to his friend Porbus' painting of Mary of Egypt before a young Nicolas Poussin offers his mistress Gillette for Frenhofer to paint. Besides "The Unknown Masterpiece," this author also wrote about a young man named Valentine who discovers a piece of Arabic-inscribed, wish-granting shagreen that shrinks when a wish is made. Other works by this man feature the criminal mastermind (*) Vautrin and the social climber Rastignac across a series of novels and stories set during the Bourbon Restoration and July Monarchy. For 10 points, identify this French author who included the novels *The Wild Ass's Skin* and *Pere Goriot* in his massive series *The Human Comedy*.

ANSWER: Honore de Balzac <Taylor/Ed. AS>

13. Proofs are equivalent to programs and propositions are equivalent to these things by the Curry-Howard isomorphism. The concept of class refers to an object's implementation details, while these things refer only to the interface of an object. Casting (*) changes objects' values for these things, and generics in Java allow these things to be parameters of methods and classes. Primitive kinds of these things cannot be decomposed and are built into programming languages. For 10 points, name these things, examples of which include string, char, and int.

ANSWER: data types [or object types; accept composite types; accept primitive types; accept subtypes; prompt on primitives] <Jonathen/Ed. JS>

14. One poem partially titled for this musical form includes the lines "the stars are not wanted now; put out every one / Pack up the moon and dismantle the sun." That poem is alternately titled "Stop All the Clocks" and was written by W.H. Auden. In another poem titled for this type of music, a man works "By the pale dull pallor of an old gas light" (*) "with his ebony hands on each ivory key," making a "poor piano moan with melody" on Lenox Street in Harlem. That poem by Langston Hughes is titled for "The Weary" type of—for 10 points—what somber musical form named after a color?

Answer: blues <Katia/Ed. AS>

15. In a play set in this country, a physicist analogizes skiing rapidly toward the edge of a cliff and deciding to turn left or right to a quantum particle choosing a slit in Young's experiment. That play set here features discussions and memories revealed by Margrethe, Bohr, and Heisenberg and is by Michael Frayn. After comparing this country to a prison, a character from a work set in this country claims "There is nothing either good or bad, (*) but thinking makes it so." A soliloquy from a play set in this country compares the world to "an unweeded garden that grows to seed" and its inhabitants as "things rank and gross." In that play set in this country, the the title character cries out "How now! A rat?" as he stabs through a curtain to kill Polonius. For 10 points name this country where *Hamlet* is set.

ANSWER: Denmark [the first two clues refer to *Copenhagen* by Michael Frayn] <Taylor/Ed. AS>

16. In the 15th century, planners in this city began work on an intersection of three buildings known as the Trident. Before he was possibly assassinated, Ottoman noble Cem Sultan was a hostage to one of this city's rulers. The leading institution and people of this city were criticized for worshipping saints' (*) bones when it was visited by a man who would later feud with Johann Tetzl. This city's Castel Sant'Angelo served as a refuge to a leader who hid there when this city was sacked in 1527 by Charles V. This city elected its leaders through a secret conclave. For 10 points, identify this city that was the capital of the Papal States.

ANSWER: **Rome** [prompt on The Vatican] <Zach/Ed. PT>

17. In the final scene of season one of Mindhunter, a song by this band plays as FBI agent Holden Ford is menaced then embraced by the serial killer Ed Kemper in a hospital room. The guitarist for this band played one of their songs at the closing ceremony of the 2012 Olympics with Leona Lewis. This band included songs like "In the Light" and "In My Time of Dying" on their 1975 album (*) *Physical Graffiti*. This band used a large foyer to add echo to the drums in their cover of "When the Levee Breaks," which appeared on their fourth self-titled album along with a song that begins "There's a lady who's sure / all that glitters is gold," which is sung by Robert Plant. For 10 points, name this English hard rock band who recorded "Whole Lotta Love" and "Stairway to Heaven."

ANSWER: **Led Zeppelin** <Taylor/Ed. TH>

18. This event was memorialized in a political poster featuring a woman draped in red, and the caption "Take Up The Sword of Justice." After it occurred, it was satirically depicted with the words "Business Above All" on a medal created by Karl Goetz. One person involved in this event described it as "a million-ton hammer hitting a steam boiler a hundred feet high," and supposedly, Charles Voegelé nearly averted this disaster. It was preceded by a similar event involving the (*) *Earl of Lathom*, which, like this event, also occurred off the Old Head of Kinsale in Ireland. For 10 points, in which disaster did SM *U-20* torpedo a British ocean liner, sparking the United States' entry into World War One?

ANSWER: The sinking of the RMS **Lusitania** <Tracy/Ed. PT>

19. Maleem Mahmoud Guinia was a Gnawa singer from this country, whose other types of folk music include Malhun and Chaabi music. *The Sand Child* is a novel from this country, written by its most acclaimed contemporary author Tahar Ben Jelloun. The dialect of Arabic spoken in this country is called Darija. In *Islam Observed*, Clifford Geertz compared how religion was practiced in (*) Indonesia and this country. The Rif Mountains lie north of the Middle Atlas Mountains in this country, which claims the territory of Western Sahara as its Southern province. The Strait of Gibraltar separates Spain from—for 10 points—what North African country governed from Rabat?

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

20. A controversial 1993 political attack ad aired in this country focused on its target's facial deformities caused by Bell's Palsy, and asked "Is this a prime minister?" A 1926 Constitutional Crisis occurred in this country when a governor general refused to dissolve parliament in the King-Byng affair. A period of political change in one of this country's provinces was known as the (*) Quiet Revolution. The Meech Lake Accord was a series of failed amendments to this nation's constitution under Prime Minister Brian Mulroney. Pierre LaPorte was kidnapped by the FLQ in this country during the October Crisis. For 10 points, name this North American country that has been led by Lester Pearson and Pierre Trudeau.

ANSWER: **Canada** <Taylor/Ed. PT>

Bonuses:

1. This figure changes places with underworld king Arawn for a year and a day after committing a faux pas by having his dogs take down a stag that belonged to Arawn. For 10 points each:

[10] Name this Welsh hero who later married Rhiannon after defeating Gwawl with some infinite bag-related trickery. He is the father of Pryderi and names the first branch of a Welsh myth cycle.

ANSWER: **Pwyll**, Prince of Dyfed [accept **Pwyll** Pen Annwn]

[10] Pwyll, Rhiannon, and Pryderi all appear in this cycle of Welsh mythology, originally translated into English by Charlotte Guest. This collection also tells the stories of Bran and Branwen as well as Culhwch and Olwen.

ANSWER: The **Mabinogion**

[10] In the second branch of the Mabinogion, Bran leads a military force to capture this island after the humiliation of his sister Branwen. This real-life island's own myths include the Ulster cycle, which features Cu Culahn.

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

2. Schubert's *Trout Quintet* is in this major key. For 10 points each:

[10] Identify this major key of Beethoven's 7th symphony and Dvorak's 1st Cello Concerto.

ANSWER: **A** major

[10] The key signature of A major has this many sharps, and the scale degree of this number is the mediant.

ANSWER: **three**

[10] The key of F sharp minor has this relationship to A major, in which they share the same key signature. This relationship is not to be confused with the parallel minor which shares the same tonic but has a different key signature.

ANSWER: **relative** minor <Taylor/Ed. TH>

3. Bart Ehrman wrote books titled for *Misquoting [this man]* and *[this man] Interrupted*, attempting to apply redaction criticism to get the proper gist of what this man really said. For 10 points each:

[10] Name this man who, according to some people, delivered 7 "I am" sayings and may have had his sayings collected in a now-lost "Q source."

ANSWER: **Jesus Christ** [accept either underlined part; accept **Jesus** of Nazareth]

[10] Bart Ehrman has written extensively about the ending of this Gospel, the shortest one, and how it's almost certain that its original author did not write the last 14 verses. This Gospel, the earliest written, was likely a major source for Matthew and Luke, forming the synoptic gospels with them.

ANSWER: The Gospel of **Mark**

[10] Ehrman defended the gnostic Gospel of this disciple as being as legitimate as the other four. This disciple claimed that he would not believe Jesus had been resurrected until he had seen Jesus's scars and touched his wounds.

ANSWER: **Thomas** <Brad/Ed. TH>

4. Answer the following about Margaret Mead, for 10 points each:

[10] Mead is probably best known for this work about the adolescent experiences of girls on a Polynesian island.

ANSWER: ***Coming of Age in Samoa***

[10] The author of the introduction to Mead's *Coming of Age in Samoa* was this man, her advisor. His own works include *Race, Language, and Culture* and *The Mind of Primitive Man*.

ANSWER: Franz **Boas**

[10] Mead's work in *Coming of Age in Samoa* was controversially challenged by this other anthropologist, who claimed he was unable to reproduce Mead's results. He described Mead's study as an "anthropological myth."

ANSWER: (John) Derek **Freeman** <Alex/Ed. AS>

5. Answer some questions about the career of the mysterious 18th century Italian occultist Alessandro Cagliostro AKA Giuseppe Balsamo. For 10 points each:

[10] During his years bopping around European courts acting as a psychic healer and magician, he failed to gain patronage with this “great” Russian Tsarina who gained the throne after the assassination of her husband Peter III.

ANSWER: **Catherine** the Great [or **Catherine II**]

[10] Balsamo was imprisoned in the Bastille for his alleged involvement in a French scandal named for this specific piece of jewelry. The event named for this object involved Marie Antoinette supposedly trying to defraud the royal jewelers.

ANSWER: The Affair of the **Diamond Necklace** [prompt on necklace]

[10] Balsamo ultimately died in prison after being captured by Inquisition spies for belonging to this fraternal organization that organizes in lodges and is symbolised with a sextant and a square.

ANSWER: **Freemasonry** [or **Freemasons**] <Taylor/Ed. PT>

6. The author of this book described his later *Prolegomena* as a more accessible “analytical” approach to the same subject. For 10 points each:

[10] Name this book, which investigates the nature of human knowledge. In it, the author claims that synthetic, a priori knowledge exists in human minds, giving the equation $7 + 5 = 12$ as an example.

ANSWER: *The Critique of Pure Reason* [accept *Kritik der reinen Vernunft*]

[10] This author of *The Critique of Pure Reason* also proposed a concept in moral philosophy which claims that an action is ethical if the actor would have that action become universal law, his “categorical imperative.”

ANSWER: Immanuel **Kant**

[10] Kant claimed to have ended the long debate in philosophy between rationalism and this other epistemological stance. This stance in philosophy holds that sensory perception is the only way to obtain knowledge.

ANSWER: **empiricism** [accept word forms such as **empirical**] <Leo/Ed. AS>

7. In 1999, the Labour Party created limitations on this body’s hereditary peers. For 10 points each:

[10] Name this upper house of the Parliament of the United Kingdom. Unlike the House of Commons, most of its members are appointed rather than elected.

ANSWER: The **House of Lords** [accept the **House of Peers**]

[10] The majority of the members of the House of Lords are these MPs, who are appointed by the Crown, usually after being recommended by the Prime Minister. They are named for the time they traditionally serve.

ANSWER: **life peers**

[10] The 26 members of the House of Lords known as the Lords Spiritual are appointed by this organization, which is currently headed by Justin Welby.

ANSWER: The **Church of England** [accept the **Anglican Church**] <Taylor/Ed. PT>

8. Identify these authors of novels set in the Soviet Union, for 10 points each.

[10] This author of *Heart of a Dog* wrote about Professor Woland’s visit to Moscow in *The Master and Margarita*.

ANSWER: Mikhail **Bulgakov**

[10] The title physician’s love for Lara is portrayed in this author’s *Doctor Zhivago*.

ANSWER: Boris **Pasternak**

[10] The trial and execution of Rubashov under the regime of No. 1 are detailed in this author’s novel *Darkness at Noon*.

ANSWER: Arthur **Koestler** <Alex/Ed. AS>

9. The main family finds out Mr. Burchell is in fact Sir William Thornhill near this end of this novel, and William eventually marries that family's daughter Sophia. For 10 points each:

[10] Name this novel about parish priest Charles Primrose, who goes bankrupt, causing Arabella Wilmot's marriage to his son to be called off.

ANSWER: *The **Vicar of Wakefield***

[10] The *Vicar of Wakefield* was penned by Oliver Goldsmith, who was from this island which was also the home of Seamus Heaney.

ANSWER: **Ireland**

[10] Oliver Goldsmith was inspired by this man's *Persian Letters* to write *The Citizen of the World*. This man articulated the theory of "the Separation of Powers" in *The Spirit of the Laws*.

ANSWER: Baron de La Brède et de **Montesquieu** [Accept Charles-Louis **de Secondat**] <Peter/Ed. AS>

10. The function of the retrocerebral organ of these organisms remains unknown, and these organisms' coronal cilia guide food into their mouths, called the mastax. For 10 points each:

[10] Name this diverse phylum of near-microscopic animals, named for their wheel-like appearance, even though they have bilateral instead of radial symmetry.

ANSWER: **rotifers** [or *Rotifera*: prompt on [wheel-animals](#)]

[10] Antonie van Leeuwenhoek, who is credited as the first biologist to observe cells with this instrument, worked on the classification of rotifers. This instrument allows scientists to see things too small for the naked eye.

ANSWER: **microscope**

[10] Rotifers commonly reproduce sexually, but can also produce in this asexual manner in which an unfertilized egg develops into an embryo. Apomeiosis and this process are components of apomixis in plants.

ANSWER: **parthenogenesis** <Taylor/Ed. JS>

11. Name some things about everyone's favorite cabinet position, the Secretary of State. For 10 points each:

[10] This Secretary of State resigned his post under Washington for violating the terms of the Treaty of Paris, but is better known for the Louisiana Purchase and for writing the Declaration of Independence.

ANSWER: Thomas **Jefferson**

[10] This man claimed that "There is a higher law than the Constitution" on the Senate floor and worked closely with political boss Thurlow Weed. This one time Governor of New York was nearly killed by one of the conspirators of John Wilkes Booth, Lewis Powell, after that man broke into his home.

ANSWER: William **Seward**

[10] This man, who got his start as Lincoln's personal secretary, negotiated the treaty to end the war with Spain, and negotiated the treaty to build the Panama Canal. He also established the "Open Door" policy with China.

ANSWER: John **Hay** <Brad/Ed. PT>

12. In the chain-growth form of this process, unsaturated monomers are added one at a time to a growing chain. For 10 points each:

[10] Name this process by which molecules like bakelite, polyethylene, and PVC are created. Aluminum co-catalysts are often used with titanium-based Ziegler-Natta catalysts in this process.

ANSWER: **polymerization**

[10] After being activated by MAO, these compounds can be used to catalyze polyolefin synthesis. The first of these compounds was discovered accidentally while trying to synthesize fulvalene.

ANSWER: **metallocenes** [accept **ferrocene**]

[10] Metallocene catalysts produce polymers with specific tacticity, which is defined by the stereochemistry of carbon centers that possess this property. Enantiomers are mirror image isomers of molecules with this property.

ANSWER: **chirality** <Jonathen/Ed. JS>

13. In a play whose title mentions one of these people, that one of these people tries to convince Jesse not to commit suicide. For 10 points each:

[10] Give this type of person who partially titles a Marsha Norman play. In a Brecht play, one of these people who struggles with illiteracy carries a red flag on the eve of the October Revolution.

ANSWER: **Mother** [accept **mama** or **mom** or equivalents; accept **'night, Mother**; accept **Mother Courage** and Her Children]

[10] In the first scene of this play, The Mother reluctantly gives a knife to her son, The Groom, preaching about the cycle of violence. This García Lorca play forms a loose trilogy with *Yerma* and *The House of Bernarda Alba*.

ANSWER: **Blood Wedding** [or **Bodas de sangre**]

[10] In Terrence McNally's play *Mothers and Sons*, Katherine loses her son Andre to this disease. This disease afflicts several of the characters in Tony Kushner's *Angels in America*, which is subtitled "A Gay Fantasia on National Themes."

ANSWER: HIV/**AIDS** <Taylor/Ed. AS>

14. One president created the gendarmerie, an armed police force of 500 men and a 120-member presidential security, to stave off a coup by this man. For 10 points each:

[10] Name this dictator who nearly bankrupted his own nation with a coronation ceremony in style of Emperor Napoleon I. This man's distant cousin, David Dacko, was both his predecessor as president and successor after the intervening of French Paratroopers in Op. Barracuda.

ANSWER: Jean-Bédél **Bokassa**

[10] Bokassa led this former French colony which fought a namesake "Bush War" in the 21st century between the UFDR and the government.

ANSWER: **Central African Republic** [or **CAR**; accept **Central African Empire** if someone insists as Bokassa led both]

[10] Bokassa received his military education from St. Louis, one of the four communes in this former French colony and modern day nation with capital at Dakar.

ANSWER: **Senegal** <Peter/Ed. PT>

15. In dichroic materials, light with different values for this quantity is absorbed differently. For 10 points each:

[10] Name this property that comes in circular, linear, and elliptical varieties. It indicates a wave's direction of oscillation, and Malus' law can be used to calculate the reduction of intensity due to this property.

ANSWER: **polarization** [accept **polarized**; do not accept "polarizability" or "polarity"]

[10] In a dielectric, the divergence of the polarization field is equal to the bound variety of this quantity's density. Electrons have a negative value for this quantity, which is measured in Coulombs.

ANSWER: electric **charge**

[10] This dimensionless quantity is the proportionality constant between the polarization of a dielectric material and the applied electric field. This dimensionless quantity plus one is equal to the relative permittivity.

ANSWER: electric **susceptibility** <Leo/Ed. JS>

16. Answer some questions about rose windows. For 10 points each:

[10] Rose windows are round, ornate windows used most prominently in this style of architecture, which developed out of Romanesque architecture in the late middle ages. Reims and Sainte-Chapelle are cathedrals in this style.

ANSWER: **Gothic** Architecture

[10] This gothic cathedral located southwest of Paris features three large rose windows. The two spires that flank the front rose window were built in contrasting styles hundreds of years apart.

ANSWER: **Chartres** Cathedral

[10] The "old" cathedral of this name in London also featured a rose window until it was destroyed in the Great Fire of 1666. The present cathedral of this name was built on the same spot in the English Baroque style by Christopher Wren.

ANSWER: **St. Paul's** Cathedral <Taylor/Ed. TH>

17. The four factor formula, which computes the k-effective for these objects, can be changed into the six-factor formula by adding thermal and fast leakage terms. For 10 points each:

[10] Name these objects in which a sustained neutron chain reaction produces heat through fission of a fissile isotope like uranium-235. Neutron absorbers like cadmium control rods are used to shape the power distributions in these objects.

ANSWER: **nuclear reactors** [accept **nuclear fission reactors**; DO NOT ACCEPT “nuclear fusion reactor”; prompt on **fuel rods** or **fuel assemblies**]

[10] In the nuclear fission plants used in the US, water acts as a coolant and this other thing, which is responsible for slowing down fast neutrons to thermal energy levels where they more readily cause fission.

ANSWER: neutron **moderator**

[10] Canadian CANDU nuclear power plants use this form of water for neutron moderation. In this substance, water’s two hydrogen atoms each contain a neutron.

ANSWER: **heavy water** [or **deuterated water** or **D2O**] <Taylor>

18. A poem by this author begins by imploring “Go, for they call you, shephard, from the hill.” For 10 points each:

[10] Name this poet of “The Scholar-Gypsy” who is better known for a poem that describes the “turbid ebb and flow / Of human misery.”

ANSWER: Matthew **Arnold**

[10] The aforementioned poem is this one, in which Arnold describes an “eternal note of sadness” heard by “Sophocles long ago” as well as a “darkling plain” where “ignorant armies clash by night.”

ANSWER: “**Dover Beach**”

[10] The speaker of this Arnold poem, an elegy for his friend Arthur Hugh Clough, describes how “Time, not Corydon, hath conquered thee.”

ANSWER: “**Thyrsis**” <Alex/Ed. AS>

19. This American TV series begins with the bus-related death of Nathaniel Sr., played by Richard Jenkins. For 10 points each:

[10] Name this mid-2000s series about the Fisher family’s funeral business in Los Angeles. This show features characters like the the gay brother David and Ruth the repressed matriarch.

ANSWER: **Six Feet Under**

[10] *Six Feet Under* was aired on this premium channel which currently airs *Game of Thrones* and *The Young Pope*.

ANSWER: **Home Box Office**

[10] Michael C. Hall plays David Fisher on *Six Feet Under*, but is perhaps more famous for playing this Miami serial killer on a Showtime series.

ANSWER: **Dexter** Morgan [prompt on **Morgan** alone] <Peter/Ed. TH>

20. The sculptures *Dying Slave* and *Rebellious Slave* were originally created for use in this larger artwork. For 10 points each:

[10] Name this sculpture completed 40 years after it was commissioned in 1545. Its most notable feature is a horned depiction of a seated Moses.

ANSWER: **Tomb** of Pope **Julius II** [prompt on partial answer; accept equivalents]

[10] The Tomb of Pope Julius II was completed by this renaissance artist whose other notable sculptures include versions of David and the Pieta.

ANSWER: **Michelangelo** di Lodovico **Buonarroti** Simoni [accept either underlined portion]

[10] Michelangelo’s *Battle of the Centaurs* is a sculpture in this form, in which elements of a flat surface are raised or lowered to create the image.

ANSWER: **relief** [or a **frieze**] <Taylor/Ed. TH>