

ACF Fall 2013

Packet by St. John's High School

Edited by Stephen Liu, Tanay Kothari, Ankit Aggarwal, Adam Silverman, Stephen Eltinge, Lloyd Sy, John Lawrence, and Andrew Hart

1. The title character of one novel by this author marries a draper who is imprisoned and escapes to France, after which she accidentally marries her half-brother. A parable about a cock and some horses opens this man's satirical pamphlet *The Shortest Way with the Dissenters*. He wrote a novel whose title character marries Jemmy and returns from the colonies to conclude a life of crime that included multiple stints in Newgate Prison. In another work by this author of *Moll Flanders*, the title shipwrecked character keeps running into cannibals as he navigates an area around the Island of Despair with Friday. For 10 points, name this British author of *Robinson Crusoe*.

ANSWER: Daniel Defoe

2. Casualties in this war include three whales who were torpedoed when mistaken for submarines. Operation Mikado was abandoned during this war when it was declared to be a suicide mission, and this war ended after the Battle of Government House. Pink Floyd's *The Final Cut* protested this war and includes the line, "Galtieri took the Union Jack," referring to one side's president. Herbert Jones led forces at the Battle of Goose Green in this war but died before its conclusion. More than half of the casualties of this war's losing side died aboard the *General Belgrano*. For 10 points, name this war between the United Kingdom and Argentina over a namesake chain of islands.

ANSWER: Falklands War [or Falkland Islands War]

3. Bruno Pontecorvo predicted a phenomenon governing changes in the superposition of these particles' flavor and mass states. These particles have been hypothesized to be their own antiparticles, implying the possibility of double beta decay without their involvement. One experiment investigating these particles' phenomenon of flavor oscillation detected them at a laboratory in Gran Sasso. The Super-Kamiokande and the Homestake Mine were both home to major experiments attempting to detect these particles produced by the sun. For 10 points, name these tiny, weakly interacting particles, named for the fact that they have no charge.

ANSWER: neutrinos [do not accept "neutron"; accept electron neutrinos, muon neutrinos, or tau neutrinos]

4. This country's town of Batopilas once contained lucrative silver mines. Multiple classical capital cities in this country have gone by the title "Tollan," meaning "among the reeds." This country and its northern neighbor engaged in the long-simmering Chamizal border dispute over land created by a shifting riverbed. The Fuertes River cuts through Copper Canyon in this country, whose citizens call the river demarcating much of its northern border the Rio Bravo del Norte. The Pyramids of the Sun and Moon and the Avenue of the Dead are found in this country's ancient city of Teotihuacan. For 10 points, name this country home of the cities of Guadalajara and Cancún.

ANSWER: Mexico [or United Mexican States; or Estados Unidos Mexicanos]

5. This man was saved from certain death because a spider constructed a web across the entrance of the cave he was hiding in. This man settled a conflict between clans by setting the Black Stone in the center of a piece of cloth and having all the clans carry it. He adopted a son named Zaid and visited Heaven and Hell on a winged steed Buraq during the second half of his Night Journey. At the Cave of Hira, this man told Jibreel that he did not know how to read. Hadiths consist of the sayings and actions of this man, who in the *hijra* fled from Mecca to Medina. For 10 points, name this man to whom the Koran was revealed, the central prophet of Islam.

ANSWER: Muhammad ibn Abd Allah [or the Prophet Muhammad]

6. Nicolas Chédeville impersonated this composer in his "The Faithful Shepherd" after making an agreement with Jean-Noel Marchand. He utilized the ritornello form in several works from a collection of 12 string concerti that

pioneered that genre. A pastoral dance in Allegro ends another of his concerti, whose first movement's depiction of birds is cut short by a trill representing a storm. This composer of *L'estro armonico* is best known for a set of four works included in *The Contest Between Harmony and Invention*. For 10 points, name this Italian composer nicknamed "the Red Priest," whose "La primavera," or "Spring," is part of *The Four Seasons*.

ANSWER: Antonio Lucio **Vivaldi** [prompt on "the Red Priest" before mention]

7. Along with King Mern of the Reach, the forces of this family were defeated at the Field of Fire. One member of this family was captured at the Battle of the Whispering Wood and later captured again by Vargo Hoat, who ordered his hand to be cut off. That member of this family was accompanied by Brienne of Tarth, to whom he revealed why he had killed Aerys Targaryen, an act that earned him the nickname "Kingslayer." This family also includes Tywin, the grandfather of Joffrey Baratheon through his daughter Cersei. For 10 points, name this family created by George R. R. Martin that wars with the Starks in HBO's *Game of Thrones*, and includes Jaime and the dwarf Tyrion.

ANSWER: House **Lannister**

8. In a reversible process, the change in this quantity for an ideal gas equals C_p times the log of the temperature ratio minus R times the log of the pressure ratio. Maxwell's relations relate the first partial derivatives of pressure, volume, temperature, and this quantity. For a reservoir absorbing heat, the change in this quantity equals the heat divided by the temperature of the reservoir. It is multiplied by temperature in a formula for Helmholtz free energy, and lost work can be attributed to increases in this quantity, which occurs for every spontaneous process according to the second law of thermodynamics. For 10 points, name this measurement of disorder symbolized S .

ANSWER: **entropy** [prompt on "S" before mention]

9. Elton Mayo's Hawthorne Works studies employed the clinical methodology of this man, whose disciple Robbie Case theorized executive control structures. This thinker created the theory of "genetic epistemology" and theorized that people understand the world through schemata. He also devised an experiment asking subjects to identify the water levels of two beakers and described a phenomenon in which something that has disappeared from view is believed not to exist, leading to his coining of the term "object permanence." For 10 points, name this Swiss psychologist who included the sensorimotor stage in his four-stage process of cognitive development in children.

ANSWER: Jean **Piaget**

10. Characters in this novel reminisce about Max Taber, who was "fixed" in a way they were not. The narrator of this novel sticks chewed pieces of gum underneath his bed to be re-chewed later and fears a fog machine. At the end of the first section of this novel, the main character shows his companions the World Series on an unplugged television. After a fishing trip in this novel, the prostitute Candy Starr helps the stuttering Billy Bibbit lose his virginity. Characters in this novel include Harding and a man who openly rebels against Nurse Ratched, Randle McMurphy. For 10 points, name this novel about a mental institution written by Ken Kesey.

ANSWER: **One Flew Over the Cuckoo's Nest**

11. Arguments over this case produced the immortal line, "when a man argues against two beautiful ladies like this, they are going to have the last word." A 1989 case overturned the Court's decision in this case by permitting legislation in the face of "undue burden." *Harris v. McRae* upheld the constitutionality of the Hyde Amendment, which was passed as a result of this case. Concurrently argued with *Doe v. Bolton*, this case had a majority opinion written by Henry Blackmun, who sided in favor of Norma McCovey. For 10 points, name this 1973 court case which used the "right to privacy" to guarantee a woman's right to an abortion.

ANSWER: *Jane* **Roe** *et. al. v. Henry* **Wade** [accept the names in opposite order]

12. Talthylus delivers unfortunate news about the fates of Astyanax and Andromache in one of this man's plays. He wrote the only surviving satyr play, in which Odysseus escapes from the lair of a one-eyed giant. This author of

Cyclops and *The Trojan Women* wrote a play in which Cadmus sees his grandson's head mistaken for that of a mountain lion, as it is brought in by Agave. The title character of another of his plays poisons some golden robes, leading to the deaths of Glauce and Creon. Pentheus is killed by the title worshippers of Dionysus in one play by this man. For 10 points, name this Greek tragedian who wrote *Medea* and *The Bacchae*.

ANSWER: Euripides

13. This man proved that \arctan of one-half plus \arctan of one-third equals π over four, and was one of two people who found continued fraction expressions for the arctangent. This mathematician solved one problem by observing that all but two of the nodes in a certain graph must have an even number of edges. A formula named for him relates the complex exponential function to cosine and sine, and when ϕ equals π , that formula gives that the exponential of $i\pi$ plus one equals 0. This man pioneered graph theory by solving the Seven Bridges of Königsberg problem. For 10 points, name this Swiss mathematician who introduced a constant equal to about 2.718 and written e .

ANSWER: Leonhard Euler

14. Eurylochus is the only man who escapes one of the actions of this figure. Canens threw herself into the Tiber river after this figure changed her husband Picus into a woodpecker. To eliminate a rival for the love of Glaucus, this figure poisoned a pool in order to change Scylla into a sea monster. This daughter of Helios gave birth to Telegonus following the visit of a hero who was left with only one ship encountering the Laestrygonians. That man resisted her tricks by eating the herb moly, which prevented this woman from turning him into a pig like all of his crew. For 10 points, name this sorceress of Aeaea, where Odysseus lived for a year during his return from Troy.

ANSWER: Circe

15. Mark Kostabi's parody of this painting features an open book lying outside to the left and is named for the street near Mulry Square. A building in this painting is painted red in its top half and green in its bottom half, and a cash register can be seen through its raised blinds. A yellow door is on the right inside the main building in this work, and stands next to two metal tanks. In front of those tanks is a blonde man in white, who is preparing an order for a woman in red and the man sitting next to her. This painting features an advertisement announcing Phillies cigars that cost five cents. For 10 points, name this painting of four people at a diner by Edward Hopper.

ANSWER: Nighthawks

16. The usage of slurred couplets accompanies one character's sighs in this opera's aria "Mi tradi, quell alma ingrata." The second act of this opera ends with a servant being accused of murder at a ball by his master. The title character of this work is told he will not laugh beyond sunset, and this opera sees Ottavio engaged to marry Donna Anna, while Zerlina is approached in "La ci darem la mano." Leporello sings this opera's best-known aria, which lists off his master's conquests. This opera features the Catalogue Aria and ends as the title character is dragged to hell by a statue. For 10 points, name this Mozart opera whose title character seduces many women.

ANSWER: Don Giovanni

17. One monarch during this dynasty with the epithet "the Victorious" curtailed the Pope's authority in the Pragmatic Sanction of Bourges and was served by Jacques Coeur. *Heptameron* author Marguerite of Navarre belonged to its Angoulême branch, and dukes of Burgundy from this dynasty included Charles the Bold. One monarch from this dynasty met an English king at the Field of the Cloth of Gold and was defeated by the Holy Roman Empire at Pavia. Another monarch from this dynasty was crowned at Reims after Joan of Arc's liberation of Orléans. For 10 points, name this French dynasty that included Francis I and Charles VII, preceding the Bourbons.

ANSWER: Valois Dynasty [or House of Valois]

18. Paget's disease is symptomatic of this other disease. Digital tomosynthesis improves the current method of detecting this disease, which has a 10% false negative rate. A common sign of this disease is overactive Neu protein,

also known as HER2, which is an EGF receptor. Familial mutations in BRCA1 or BRCA2 result in a greater susceptibility to this disease. The method for detecting this disease scans for microcalcifications and can also detect ductal carcinoma *in situ*, and is recommended for women over forty every two years. For 10 points, name this disorder detected by a mammogram, a cancer most common in women.

ANSWER: **breast cancer** [prompt on “cancer”]

19. This thinker used the term “playing forth” to describe the swaying of alternate beginnings in a work organized into six “joinings,” his *Contributions to Philosophy (From Enowning)*. He compared a hydroelectric power plant to a windmill in a work that contrasts the “supreme danger” and “saving power” of the title concept. This author of *The Question Concerning Technology* contrasted the definable causes of “fear” with the indefinable cause of “angst” in his most famous work, which introduces the concept of “being-there,” or the *Dasein*. For 10 points, identify this German philosopher who was tainted by his association with the Nazis and who wrote *Being and Time*.

ANSWER: Martin **Heidegger**

20. While quaestor, this man passed a bill which reduced patrician influence on elections by thinning the ramps to the voting platforms. This man nearly met his downfall over the formation of veteran’s colonies on land north of the Po already owned by Roman citizens. The actions of Bocchus I led this man’s greatest rival to capture a Numidian who this man defeated, Jugurtha. At the Battles of Vercellae and Aquae Sextiae, this man defeated invading Cimbri and Teutones tribes, actions for which he was called “the third founder of Rome.” For 10 points, name this seven-time Roman consul and rival of Sulla known for his military reforms.

ANSWER: Gaius **Marius**

21. In this novel, Jacques Coppenole disrupts a performance of *The Good Judgment of Madame the Virgin Mary* to describe a Flemish religious ceremony. Torterue and Charmolue extract a false confession from one character in this novel, who is later assisted by the poet Gringoire. Fleur-de-Lys is jealous of one character in this novel, who is the focus of the affections of Phoebus de Chateaupers and owns the goat Djali. This novel’s title character kills Claude Frollo, who puts Esmeralda to death when his love is spurned. For 10 points, name this novel about the deaf bellringer Quasimodo, written by Victor Hugo.

ANSWER: *The* **Hunchback of Notre Dame** [or *Notre-Dame de Paris*]

X. Alexander Wilson observed that these objects behave as if they are slight depressions. George Hale noted that the magnetic polarities of these objects align east to west and periodically switch orientations. Horace Babcock created a model that explains why these objects tend to move towards lower latitudes, as observed by Richard Carrington. The Wolf number gives the number of these objects, which varies in an 11-year cycle described by Spörer’s law. These objects are often the endpoints of coronal loops, and they are caused when magnetic activity inhibits convective heat transfer. For 10 points, name these dark areas of reduced temperature on the surface of the Sun.

ANSWER: **sunspots**

X. The title creature of one of this author’s poems “knew the old no more” and inhabits an area described as having “irised ceiling rent, its sunless crypt unsealed.” In another poem, he declared that “harpies of the shore shall pluck / the eagle of the seal!” In one poem, he described a creature who “left the past year’s dwelling for the new” and “spread his lustrous coil.” The narrator of a poem by this author looks to a “ship of pearl” and exhorts, “Build thee more stately mansions, O my soul!” Another poem by him begins, “Ay, tear her tattered ensign down!” and describes the *USS Constitution*. For 10 points, name this poet of “Old Ironsides” and “The Chambered Nautilus.”

ANSWER: Oliver Wendell **Holmes**, Jr.

1. This novel's characters include the immoral Komarovsky, who carries on an affair with Amalia while courting her daughter. For 10 points each:

[10] Name this novel whose title character pursues a romance with Lara during his stay in the Ural town of Varykino and writes a lot of poetry. He is conscripted to serve as a medic during World War One.

ANSWER: Doctor Zhivago

[10] This Soviet author of *Doctor Zhivago* was forced by his own country to decline the Nobel Prize when he won it largely on the merits of that novel.

ANSWER: Boris Pasternak

[10] Komarovsky bankrupts Yuri Zhivago's father through his work in this profession. Another member of this profession tries to turn the Public Prosecutor and Governor against one another in Nikolai Gogol's *Dead Souls*.

ANSWER: lawyer [or law]

2. This book discusses why post-World War II America prospered in the private sector while remaining stagnant in the public sector. For 10 points each:

[10] Name this book that coined the term "conventional wisdom" and discussed the dependence effect, in which corporate planning and advertising creates unnecessary wants for Americans because their needs are fulfilled.

ANSWER: The Affluent Society

[10] This Canadian-American author wrote *The New Industrial State* as well as *The Affluent Society*.

ANSWER: John Kenneth Galbraith [accept Ken Galbraith]

[10] Galbraith was influenced by this Norwegian-American thinker, who coined the term "conspicuous consumption" in *The Theory of the Leisure Class*.

ANSWER: Thorstein Bunde Veblen [or Torsten Bunde Veblen]

3. This man's namesake dot structures uses dashes to represent bonds and dots to represent electrons. For 10 points each:

[10] Name this American chemist.

ANSWER: Gilbert N. Lewis

[10] Lewis dot structures fail for molecular oxygen, which actually exists in this "diradical" state with a higher spin state. This state corresponds to a total spin of 1 and gives oxygen its paramagnetic behavior.

ANSWER: triplet state

[10] Lewis structures also have to resort to double-headed arrows to represent this phenomenon, in which electrons are delocalized over a pi system and an intermediate bond order is subsequently predicted in the resulting hybrid.

ANSWER: resonance

4. This symphony's Vivace con spirito movement represents the title character's encounter with the Alpine fairy. For 10 points each:

[10] Name this unnumbered symphony, written between its composer's fourth and fifth symphonies. Its title figure is depicted traveling in the Alps, and reminisces about Astarte in its *Lento lugubre* movement.

ANSWER: Manfred Symphony in B minor

[10] The *Manfred* Symphony was composed by this Russian, who commemorated the Battle of Borodino in his *1812 Overture*.

ANSWER: Pyotr Ilyich Tchaikovsky

[10] This work was Tchaikovsky's final completed symphony. It features a bassoon solo marked by six p's, has a "limping waltz" in 5/4 time in its Adagio section, and shares its nickname with Beethoven's 8th piano sonata.

ANSWER: Symphony No. 6 in B minor, "Pathétique" [accept either underlined part]

5. One poem by this man concludes by describing "the might of the Gentile" as having "melted like snow in the glance of the Lord." For 10 points each:

[10] Name this Romantic poet who wrote an “epic satire” in which Lady Adeline and Catherine the Great are among the many women who fall in love with young Don Juan. He also wrote *Childe Harold's Pilgrimage*.

ANSWER: George Gordon, Lord **Byron**

[10] This is the aforementioned poem by Byron. It describes a king's failed attempt to conquer Jerusalem and begins with the line, “The Assyrian came down like a wolf on the fold.”

ANSWER: “The **Destruction of Sennacherib**”

[10] Byron also wrote this other poem that describes “a heart whose love is so innocent.” A woman is likened to “the night / of cloudless climes and starry skies” as she performs the titular action of this poem.

ANSWER: “**She Walks in Beauty**”

6. Some Texan politicians have made the news for speaking out in length to oppose certain bills. For 10 points each:

[10] This Democratic state senator staged an eleven hour filibuster to block the passage of Senate Bill 5, which placed restrictions on abortions. However, Rick Perry simply reconvened the Senate and passed the bill anyway.

ANSWER: Wendy **Davis**

[10] This formerly Canadian junior senator spoke for over twenty one hours to the Senate about Obamacare, and he was perhaps the greatest force behind the Republican shutdown of the government in 2013.

ANSWER: Ted **Cruz**

[10] Rand Paul, who grew up in Texas, filibustered for thirteen hours about the Obama administration's use of drones to prevent the nomination of this man, the current director of the CIA. That filibuster didn't work either.

ANSWER: John Owen **Brennan**

7. This microtubule-organizing center duplicates and moves to opposite poles of the cell, where it becomes an aster. For 10 points each:

[10] Name this region of the cell containing centrioles and pericentriolar material.

ANSWER: **centrosome**

[10] Spindle fibers grow from the centrosome during this process of cell division that produces two identical daughter cells.

ANSWER: **mitosis** [do not accept or prompt on “meiosis”]

[10] Progress in the cell cycle is governed by these proteins, which are numbered one through six and which phosphorylate target serine and threonine residues. CKIs inhibit these proteins.

ANSWER: **cyclin-dependent kinases** [or **CDKs**]

8. This author described one location as “true poverty and absolute nothingness.” For 10 points each:

[10] Name this author of *The Seven Valleys*, born Mirza Husayn ‘Ali Nuri. He founded a religion whose calendar features nineteen months with nineteen days each and also wrote the *Kitab-i-Aqdas*, that religion's central book.

ANSWER: **Baha'u'llah**

[10] Baha'u'llah founded this monotheistic faith, which is governed from the Universal House of Justice in Haifa, Israel. Shoghi Effendi was one of its Guardians.

ANSWER: **Baha'i**

[10] Baha'u'llah's last major work was titled “Epistle to the Son” of one of these animals. St. Francis befriended one of these animals at Gubbio.

ANSWER: **wolf** [or **wolves**]

9. Answer the following about the twentieth-century papacy, for 10 points each:

[10] This Pope notably remained silent during the Holocaust but was a vocal anticommunist after World War II.

ANSWER: **Pius XII**

[10] John XXIII was succeeded by Paul VI, who himself preceded two popes with this name. The first reigned for only thirty-three days in 1978, while the second was the first non-Italian pope since the sixteenth century.

ANSWER: **John Paul**

[10] John Paul II survived a 1981 assassination attempt by this Mehmet Ali Acga of the Grey Wolves, a militant fascist group from this country, which is currently led by Prime Minister Recep Tayyip Erdoğan.

ANSWER: Republic of **Turkey** [or **Türkiye** Cumhuriyeti]

10. This geographic area is sometimes called the Laurentian Plateau. For 10 points each:

[10] Name this large area of thinly covered igneous and metamorphic rocks that extends north from the Great Lakes through its namesake country.

ANSWER: **Canadian Shield** [or **Bouclier Canadien**]

[10] The Canadian Shield forms the Thousand Islands when it meets this river, which forms the bulk of a seaway between the Atlantic Ocean and the Great Lakes. It also forms part of the boundary between Ontario and New York.

ANSWER: **St. Lawrence** River [or Fleuve **Saint-Laurent**]

[10] The Canadian Shield reaches its southernmost extent at these New York mountains whose highest peak is Mount Marcy.

ANSWER: **Adirondack** Mountains [or **Adirondacks**]

11. The newest format for addresses in this standard separates blocks of numbers by colons and allows leading zeros to be dropped. For 10 points each:

[10] Name this communications standard, whose aforementioned version 6 is in the process of replacing its version 4. It is often paired with TCP, and computers are identified on the Web using its namesake addresses.

ANSWER: **Internet Protocol** [or **IP**]

[10] Every digit in an IPv6 address is a number of this type, which may be represented by the digits from 0 to 9 combined with the letters from A to F.

ANSWER: **hexadecimal**

[10] IPv6 also introduces increased functionality for this process, in which a signal is transmitted to multiple receivers at once. In IPv6, addresses used for this process always begin with the numbers “FF.”

ANSWER: **multicasting**

12. The sea goddess of these people married a dog, causing her father Anguta to cut off her fingers as she held on to the side of a boat. For 10 points each:

[10] Name this group of people who venerated that goddess, Sedna, who later came to rule over the underworld of Adlivun.

ANSWER: **Inuits** [accept **Eskimos** but inform teams that this term is racist]

[10] In Roman mythology, this son of Venus entered the underworld with the help of the Cumaean Sibyl, who informed him that he needed to retrieve a branch made of gold to offer to Proserpina.

ANSWER: **Aeneas**

[10] This hero traveled to the underworld in order to find his wife Eurydice after she died of a snakebite. His sweet music won him his wife back, but only under the condition that he would not look back at her as they left Hades.

ANSWER: **Orpheus**

13. This artist paired his depiction of *Christ Washing the Disciples' Feet* with a painting that features a woman seated in front of a wash basket to the right of the main scene. For 10 points each:

[10] Name this Italian artist whose depiction of the *Last Supper* places the table at a diagonal perspective.

ANSWER: **Tintoretto** [or Jacopo **Comin**; or Jacopo **Robusti**]

[10] Tintoretto was commissioned to paint four works on the life of this figure in 1546. One of those paintings about this man, *The Miracle of the Slave*, shows him saving a slave from being martyred.

ANSWER: Saint **Mark**

[10] Tintoretto was from this Italian city, the site of Saint Mark's Cathedral. True to his name, Canaletto painted many depictions of the canals of this city.

ANSWER: Venice [or Venezia]

14. The narrator of this poetic collection is taken through Hell by Plotinus. For 10 points each:

[10] Name this extensive poetic collection that was partly completed while its author was imprisoned in Pisa. The poet of this collection included Chinese ideograms in its "Rock Drill" section.

ANSWER: *The Cantos*

[10] This American Imagist poet of *The Cantos* mentioned "the apparition of these faces in the crowd" in his short poem "In a Station of the Metro."

ANSWER: Ezra Loomis Pound

[10] This other Imagist writer wrote a work about Edward Ashburnham's infatuation with the young Nancy, which causes his wife to out him as a philanderer, driving him to suicide. That novel is *The Good Soldier*.

ANSWER: Ford Madox Ford

15. J.L. Mackie divided omnipotence into two orders in order to de-problematize this concept. For 10 points each:

[10] Name this concept, whose namesake "problem" arises from reconciling its existence in the world with the existence of a God who is omnipotent, omniscient, and omnibenevolent, and thus should not allow it.

ANSWER: problem of evil

[10] The "problem of evil" is addressed in the *Guide for the Perplexed* by this Medieval Jewish philosopher, whose 14-volume *Mishneh Torah* is still a key text in the study of Talmudic law.

ANSWER: Moses Maimonides [or Rambam]

[10] The "banality of evil," or the idea that great evils are mostly committed by ordinary people who believe their actions to be normal, was introduced by Hannah Arendt in this work about the trial of a prominent Nazi.

ANSWER: Eichmann in Jerusalem

16. Fourier's law can be used to derive an equation named for this quantity. For 10 points each:

[10] Name this quantity, consisting of energy transferred between systems due to conduction or radiation. This quantity will flow from areas of higher temperature to those of lower temperature.

ANSWER: heat

[10] The heat equation contains a term proportional to the thermal diffusivity, which is symbolized by this Greek letter. The fine structure constant is also symbolized by this letter.

ANSWER: alpha

[10] The discretized version of Fourier's law, which states that an object's rate of heat loss is proportional to the difference in temperature between it and its surroundings, is named for this English physicist.

ANSWER: Isaac Newton

17. Name these things related to 19th century German unification, for 10 points each:

[10] The Education Minister Adalbert Falk was instrumental in the passage of these 1873 laws, named for a certain month, giving the state responsibility for selecting and training of clergymen.

ANSWER: May Laws

[10] The May Laws were a part of this political campaign to secularize Prussia. At the height of this campaign that was opposed by the Catholic Church, over half of Prussia's bishops had been imprisoned.

ANSWER: Kulturkampf

[10] The Kulturkampf was initiated by Otto von Bismarck, who oversaw the coronation of a Kaiser of this name. Another Kaiser of this name ruled the German Empire during World War I.

ANSWER: Wilhelm [or William]

18. Indra's daughter concludes that the human condition is unfortunate after visiting Earth in this author's *A Dream Play*. For 10 points each:

[10] A woman who thinks she is a parrot and a milkmaid ghost visible to Arkenholz are among the characters in one of this man's plays, while Laura pretends to be an adulteress to get custody over Bertha in this man's *The Father*.

ANSWER: August Strindberg

[10] The title character of this play by Strindberg tries to get Jean to help her open a hotel at Lake Como. She kills herself with the shaving razor that Jean uses to kill her canary, Serena.

ANSWER: Miss Julie [or Fröken Julie]

[10] August Strindberg is a playwright from this Scandinavian country, which was also home to the Nobel Laureates Tomas Tranströmer and Selma Lagerlöf.

ANSWER: Sweden

19. He ordered an invasion of the mulatto state led by Andre Rigaud. For 10 points each:

[10] Name this leader of an early 19th century Caribbean slave insurrection who was betrayed by Jean-Jacques Dessalines. This man's rebellion was the only slave revolt in history to lead to the creation of a new state.

ANSWER: Toussaint Louverture

[10] Louverture led what would become this nation, which shares the island of Hispaniola with the Dominican Republic. It finally won its freedom from France at the Battle of Vertieres.

ANSWER: Republic of Haiti [or République d'Haïti]

[10] This army officer and husband of Pauline Bonaparte was dispatched by Napoleon to suppress Louverture's slave uprising, imprisoning him during a parley session. He later died of yellow fever.

ANSWER: Charles Victoire Emmanuel Leclerc

20. Answer the following about women and photography, for 10 points each:

[10] Sharbat Gula, better known as "Afghan Girl," was depicted wearing a red scarf in a Steve McCurry photo that graced the cover of this magazine.

ANSWER: National Geographic

[10] Florence Owens Thompson was the subject of this photograph taken by Dorothea Lange. It depicts a woman with her two children during the Great Depression.

ANSWER: Migrant Mother

[10] This woman's photograph of the Fort Peck Dam appeared on the first cover of Life magazine. She collaborated with her husband Erskine Caldwell on *You Have Seen Their Faces* and photographed Gandhi at his spinning wheel.

ANSWER: Margaret Bourke-White

21. John F. Kennedy visited this nation in 1963, and its Honor Guard was present at his funeral. For 10 points each:

[10] Name this European island nation whose Catholic citizens moved to the US en masse in the nineteenth century. Immigrants from this nation created organizations like the Molly Maguires and Fenian Brotherhood.

ANSWER: Ireland

[10] Many of the workers in this city's textile mills were female Irish immigrants. This Massachusetts city lent its name to a system of manufacturing in which women lived and worked away from their families at the mill.

ANSWER: Lowell, Massachusetts [or the Lowell system]

[10] Irish immigrants also were responsible for the 1870 Orange Riots in this city in memory of the Battle of the Boyne. In this American city, more than one hundred people were killed in an 1863 draft riot.

ANSWER: New York City [or NYC]

X. After his friend Kizuki dies in this novel, the protagonist pursues a relationship with Kizuki's girlfriend, Naoko. For 10 points each:

[10] Name this novel in which Toru Watanabe's philandering causes Naoko to commit suicide, especially as he becomes more obsessed with Midori. This novel takes its name from a Beatles song that begins Toru's reminiscing.

ANSWER: Norwegian Wood

[10] Toru Okada leaves his passive life to go look for his missing cat in this author's novel *The Wind-Up Bird Chronicle*. This contemporary Japanese author wrote *Norwegian Wood* and the three-volume novel *1Q84*.

ANSWER: Haruki Murakami

[10] One of Murakami's short story collections takes place "after" one of these catastrophic events, which occurred in Kobe in 1995. In a Voltaire work, Candide gets injured during one of these events in Lisbon in 1755.

ANSWER: earthquakes [accept After the Quake]

X. One cause of this man's falling-out with the ruler he served was the question of whether to ally with France or Burgundy, and this man's daughters married the dukes of Clarence and Gloucester. For 10 points each:

[10] Name this cousin and advisor to Edward IV of England, a pivotal figure in English royal history known as "the Kingmaker."

ANSWER: Richard Neville, Earl of Warwick [accept either answer; accept Warwick the Kingmaker]

[10] The Earl of Warwick briefly restored Henry VI to the throne before being killed at the Battle of Barnet in this protracted series of conflicts between the houses of York and Lancaster.

ANSWER: Wars of the Roses

[10] Warwick was a tutor of this king from the House of York who died at the Battle of Bosworth Field. His scoliosis-afflicted body was recently found underneath a parking lot.

ANSWER: Richard III

X. In solutions, a critical temperature known as the theta point determines whether these substances crumple into a "globule" or dissolve. For 10 points each:

[10] Name these large molecules, whose solutions are described by Flory-Huggins theory. One model for their behavior is called the Gaussian chain, because their average length follows a Gaussian distribution.

ANSWER: polymers

[10] The Gaussian chain models a polymer as one of these stochastic processes. When the state of this process does not depend on previous states, it may be described by a Markov chain.

ANSWER: random walk

[10] The interaction of polar polymers with polar solutions often involves these forces, which are dipole-dipole interactions between electronegative elements like nitrogen and oxygen and the namesake element.

ANSWER: hydrogen bonds