



NASAT 2015 - Round 02 - Tossups

1. In the *Iliad*, this man recounts how Hera influenced both the premature birth of Eurystheus and the delayed birth of Heracles, which caused Zeus to banish the goddess Ate (**AH-tee**) from Olympus. This warrior remains unharmed when a spear strikes his silver belt and its point uselessly bends. This man kills Iphidamas, but is wounded by his brother Coön (**coh-AHN**). This hero's arrogance is rebuked by the repugnant Thersites. This warrior ends Apollo's plague by returning Chryseis to the Trojans, but fuels the rage of Achilles when he seizes Briseis as compensation. Electra and Orestes avenge this man's death, brought on in part by his wife Clytemnestra. For 10 points, name this Mycenaean king who leads the Greek army in the Trojan War.

ANSWER: Agamemnon <Kim>

2. In a novel, these objects are variously described as Ee Gee, the amazing editor, an Olympic lady crew champion, and a brilliant professor. Esther says, "I saw my life branching out before me" and describes "every branch, like a fat purple" one of these objects in *The Bell Jar*. These objects name a collection containing the line, "We were very tired, we were very merry," that ends with a sonnet opening, "I shall forget you presently, my dear." "Recuerdo" and a two-line poem beginning, "Safe upon the solid rock the ugly houses stand," follow a poem that opens, "My candle burns at both ends," in that collection titled after this fruit. For 10 points, name these fruits, "a few" of which title a collection by Edna St. Vincent Millay.

ANSWER: figs <Smart>

3. This phenomenon gives rise to the inversion of the nitrogen atom in an ammonia molecule, splitting the ground state vibrational level. In a device that relies on this process, an increase in voltage is accompanied by a decrease in current, forming a region of negative resistance. This process is responsible for a form of magnetoresistance used by the read heads of hard drives. Finding the probability of this phenomenon is a prime application of the WKB approximation because it can be exact for this phenomenon. George Gamow was able to calculate the correct rate of alpha decay by supposing that this phenomenon was responsible. For 10 points, name this purely quantum phenomenon in which a particle traverses a classically impenetrable barrier without going over it.

ANSWER: quantum mechanical tunneling [or tunnel effect] <Golimlim>

4. This composer included a duet between a clarinet and the soloist in the second cadenza of the "Allegro con fermezza" first movement of his violin concerto. Performances of a concerto by this composer made pianist William Kapell famous. That piece uses an F-B double-flat-A flat theme and includes a flexatone part. His *Violin Concerto* was written for David Oistrakh. An adagio depicting carpet weavers appears in a ballet by this composer whose title character marries Kazakov after her husband Giko sets fire to a cotton warehouse. An excerpt from that ballet about workers on a collective farm begins with the xylophone playing F-sharp eighth notes. For 10 points, name this Armenian Soviet composer whose *Gayane* includes the "Sabre Dance."

ANSWER: Aram **Khachaturian** [or Aram Il'yich **Khachaturian**] <Kothari>

5. L.G. Freeman argued that the Spanish sites of Ambrona and Torralba provide evidence that this species could organize to hunt large animals. This species developed teardrop-shaped hand axes while being the first to use the Acheulean tool making tradition. The name for this species was first proposed by Ernst Haeckel, the teacher of Eugene Dubois. A site with fossils of this species was excavated by Pierre Teilhard de Chardin and Franz Weidenreich. This hominid species, which lived about 1.8 million years ago, was the first to appear outside of Africa. Examples of this extinct species include Peking Man and Turkana Boy. For 10 points, name this hominid species whose name is Latin for "upright man."

ANSWER: *Homo* **erectus** [or **H. erectus**; or **Pithecanthropus erectus**; or **P. erectus**; or *Homo* **ergaster**; or **H. ergaster**] <O'Rourke>

6. This town's inhabitants include a woman who insists on wearing the same clothes as her sister, because otherwise they will look "as if [they] were no kin to one another." Mr. Snell and Mr. Macey are among the common visitors to this town's tavern, the Rainbow. A man from this town offers lard cakes to his future son-in-law, Aaron Winthrop. This town's best-known denizen moved here from Lantern Yard. This town's Red House is home to a man who marries Nancy Lammeter, Godfrey Cass. In a pivotal scene, a character who lives in this town reaches out for what he thinks is his stolen gold, only to grab the hair of the infant Eppie. For 10 points, name this town created by George Eliot which is home to the weaver Silas Marner.

ANSWER: **Raveloe** <Sy>

7. To boost interest in this group, James Colescott lowered membership fees to six dollars. Elizabeth Tyler and Edward Clarke were two public relations agents that improved this group's image, with Tyler publishing its newspaper, *The Searchlight*. This organization's "northern realm" was led by a rival of its leader Hiram Wesley Evans. This group sagged in popularity after the conviction of D.C. Stephenson for rape and murder. Its second incarnation was founded by William Simmons at Stone Mountain in 1915. Interest in this group exploded after the success of D.W. Griffith's film *The Birth of a Nation*. For 10 points, name this group of white hooded nativists who burn crosses.

ANSWER: **Ku Klux Klan** [or **KKK**; or the **Klan**] <Cheyne>

8. The van Laar equation defines the excess of this quantity based on component mole fractions. In protein folding calculations, the phi value is a ratio of two forms of this quantity, preceded by two deltas. The definition of exergy is nearly identical to this other quantity. Phase equilibrium occurs where two surfaces for this property, in different phases, intersect. This quantity uses temperature and pressure as its natural variables. Any thermodynamic driving force must cause this quantity to decrease. At standard state, the cell voltage times nF equals this quantity. It is defined as the enthalpy minus temperature times entropy. For 10 points, name this quantity whose change is negative in spontaneous processes, which is symbolized G .

ANSWER: **Gibbs** free energy [or **G** until "symbolized" is read; prompt on free **energy**; prompt on **chemical potential** or **mu**] <Silverman>

9. This artist depicted numerous bowler hatted men sitting under a pier in a work titled "The Short Tail Gang." This artist wrote a very short children's book titled *Is There a Santa Claus?* In one work of art by this man, at least ten threatening looking toughs stare at the viewer while standing in a back alley at 59 ½ Mulberry Street. Another of his artworks, subtitled "Five Cents a Spot," is set at Bayard Street and shows lodgers crammed into a dirty bedroom. This artist created works like "Bandit's Roost" using a magnesium flash. His best known work is subtitled "studies among the tenements of New York." For 10 points, name this photographer and journalist who wrote *How the Other Half Lives*.

ANSWER: Jacob **Riis** <Cheyne>

10. An argument between two native women in this country over Captain William Darby Brind led to the Girls' War. This country is where the missionary Carl Volkner was beheaded by members of the Pai Marire movement. A conflict in this country was sparked by the cutting of a flagstaff. Nearly seventy crew members of the *Boyd* were eaten by this country's natives. After captaining the HMS *Beagle*, Robert FitzRoy served two years as this country's governor. The Musket Wars took place in this country, where William Hobson met with native leaders to sign the Treaty of Waitangi. For 10 points, name this Pacific country home to the Maori.

ANSWER: **New Zealand** [or **Aotearoa**] <Golimlim>

11. Early 20th century politics in this country were dominated by its Agrarian National Union. A blind faith healer and mystic from this country, Baba Vanga, had a controversial relationship with Lyudmila, the daughter of its longtime ruler. This country pursued the Treaty of Craiova to recover territory lost in the Treaty of Neuilly, its "second national catastrophe," which saw it lose Southern Dobruja. A ricin-injecting umbrella was used to kill Georgi Markov, who fled this country's communist regime under Todor Zhivkov. For 10 points, name this eastern European country with capital at Sofia.

ANSWER: **Bulgaria** <Ray>

12. This man commissioned Christian Wilhelm Dohm to write a book on "civil improvement" and wrote a non-Kantian essay entitled "What is Enlightenment," which answers the question with "bildung" or the cultivation of human talents. This man responded to rumors that his friend had made a deathbed confession to being a follower of Spinoza by writing *Morning Hours* and *To Lessing's Friends* in denunciation of pantheism. This man began to doubt the possibility of assimilation after engaging in a debate with Johann Caspar Lavater in which he promised to convert to Christianity if he did not prevail. For 10 points, name this author of *Jerusalem: Or, on religious power and Judaism*, who was a leading member of the "haskala" movement and grandfather of composer Felix.

ANSWER: Moses **Mendelssohn** [or **Moshe ben Mendel** mi-Dessau] <Bollinger>

13. In this novel, a man hanging onto a branch is mercifully killed with the last bullet of a character who constantly calls himself a "man of no cross." A soldier in this novel pretends to be a doctor so that he can save his beloved by wrapping her in a blanket and running away with a man dressed up as a bear. A man known as "Le Renard Subtil" in this novel lost his position after becoming an alcoholic. Near its end, a crowd awaits the verdict concerning "La Longue Carabine" given by the elder Tamanend. It opens as General Webb organizes a march toward Fort William Henry, while Duncan Heyward accompanies the Munro sisters. For 10 points, name this novel in which Uncas and Hawk-Eye fight the Hurons in upstate New York, by James Fenimore Cooper.

ANSWER: *The **Last of the Mohicans*** <Sy>

14. The bregma is the intersection of two regions of this structure. Battle's sign may arise from the basilar type of damage to this structure. Diploe [dip-lo-ee] forms a cancellous region between the outer and vitreous tables of this structure. It's not the tooth, but Sharpey's fibers bind a type of synarthrodial fibrous joint only found in this structure. A gland is positioned in a depression in this bony structure known as the sella turcica, which is a region of its sphenoid bone. In infancy, this structure's calvaria normally has fontanelles, or "soft spots," due to incomplete fusion of sutures, which join parts of it such as the parietal and frontal bones. For 10 points, name this bony structure that encases the brain.

ANSWER: **cranium** [or **skull** cap; or word forms, such as **cranial**] <Smart>

15. The 1963 murder of Edmund Assare-Addo prompted African students to protest in this area. In 2013, as part of an act titled *Fixation*, a performance artist sat naked in this area with a nail driven through his scrotum. Orthodox Patriarchs once rode through this present-day area on a donkey during Palm Sunday. Mathias Rust landed a Cessna plane in this area in 1987. Tanks and missiles were paraded through this place on Victory Day. The quote "Lazar! Put it back!" is attributed to a premier seeing a model of this area that omitted St. Basil's Cathedral. For 10 points, name this area next to the Kremlin, the central square of Moscow, Russia.

ANSWER: **Red** Square [or **Krasnaya** Ploshchad; prompt on descriptive answers that mention **Moscow** until "Moscow" is read; do not accept "the Kremlin"] <Golimlim>

16. In a play by this author, a huge effigy of the title character shaking his head and carrying a Bible with crossed-out pages is paraded around in a float. A series of characters draw lots and receive the black cross of death at the start of a play by this author interspersed with musical numbers like the "Fraternization Song," sung by the army camp prostitute Yvette. In another of his plays, Andrea visits his former master, who is living under house arrest despite having recanted his scientific beliefs. The title character of his best-known play resolutely pulls the wagon despite the murder of Katrin and the executions of Eilif and Swiss Cheese during the Thirty Years War. For 10 points, name this German dramatist of *Mother Courage and Her Children*.

ANSWER: Bertolt **Brecht** <Gupta>

17. This action was similar to one which occurred in Syracuse and used leaves, or *petala*. An illiterate farmer once called for this action because he was sick of hearing a leader referred to as "the Just." An instance of this action occurred after a man built a sanctuary to Artemis of the Best Advice and put a statue of himself inside it. Aristotle claims that, for its first three years, the targets of this action were exclusively "friends of the tyrants," the relations of Pisistratus. At least 6,000 pottery shards had to be collected for this practice to occur. This practice did not deprive its victims of property rights or citizenship during the ten year period it imposed. For 10 points, name this Athenian practice by which citizens could be banished by popular vote.

ANSWER: **ostracism** [or other word forms; prompt on answers like **banishment** or **exile**] <Brownstein>

18. This artist's brother was an inept painter nicknamed "The Splinter." This artist depicted the infant Jesus eating grapes in his earliest-attested painting, the *San Giovenale Triptych*. This artist carved a Latin inscription reading "I once was what you are and what I am you also will be" atop a skeleton resting on a cadaver tomb in a version of the Crucifixion under a Roman-style coffered barrel vault in the church of Santa Maria Novella. He painted an angel with a flaming sword chasing Adam and Eve in one painting, and depicted St. Peter extracting a coin from a fish's mouth in another. For 10 points, name this Renaissance artist whose Brancacci Chapel paintings include *The Expulsion from the Garden of Eden* and *The Tribute Money*.

ANSWER: **Masaccio** [or Tommaso di Ser Giovanni di Simone **Cassai**] <Lee>

19. This prophet cuts his hair into three parts and burns one portion, cuts up the second portion, and scatters the third portion in the wind; he also spends a year lying on his side. This prophet envisions a new city named "The Lord Is There" and details the architecture of a Third Temple. He declares that that God will strike down Gog, ruler of Magog (**MAY-gog**), and bury his army in the Valley of Hamon-Gog. This prophet witnesses four creatures, each with faces of a human, a lion, an ox, and an eagle, who are carrying a flaming chariot. Later, he travels to a valley where he brings dry bones to life. For 10 points, name this third of the Major Prophets whose book follows those by Isaiah and Jeremiah.

ANSWER: **Ezekiel** [or **Y'hez'qel**; or **Duhl-Kifl**] <Kim>

20. This phenomenon occurs when free flow transitions to synchronized flow, which can further transition into its wide-moving form, according to Boris Kerner's three phase theory. In a famous example of induced demand, increasing capacity does not, in the long-term, decrease the incidence of this phenomenon because additional peak-period trips take place until its incidence is back to previous levels. Some theories about this phenomenon were formulated based on data collected from the Bundesautobahn 5. HOV lanes are designed to decrease the incidence of this phenomenon. For 10 points, name this transportation phenomenon often encountered during rush hour, in which an excess of cars leads to a slowdown in travel times.

ANSWER: **traffic** congestion [or **traffic** jams; or traffic **congestion**; or traffic **jams**] <Smart>

21. During a conflict over this resource, the *Numancia* became the first ironclad ship to circumnavigate the world. This resource was mined on Navassa Island, which is now disputed by the United States and Haiti. Isabella II warred with former Spanish colonies in the Chincha Islands, a center for mining this resource. An 1856 act passed by James Buchanan allowed American citizens to seize islands abundant in this resource, including the Swan Islands now owned by Honduras. Peru heavily exported this nitrogen-rich resource in the nineteenth century. For 10 points, name this fertilizer produced from the droppings of bats and seabirds.

ANSWER: **guano** [prompt on **excrement** or equivalents] <Golimlim>



NASAT 2015 - Round 02 - Bonuses

1. Giuseppe Garibaldi lived on this island with the inventor Antonio Meucci. For 10 points each:

[10] Name this borough of New York City that is linked to Brooklyn via the Verrazano-Narrows Bridge.

ANSWER: **Staten** Island

[10] Staten Island's Fresh Kills estuary was once home to a large one of these sites. Other examples of these sites in New York include 102nd Street and Love Canal, both of which are now Superfund sites.

ANSWER: **landfills** [or **dumps**; or obvious equivalents]

[10] A large Sri Lankan population inhabits this neighborhood of Staten Island, which is named for a man who unsuccessfully ran for governorship against DeWitt Clinton while he was James Monroe's Vice President. Daniel Pantaleo put Eric Garner in a chokehold in this neighborhood.

ANSWER: **Tompkinsville** <Golimlim>

2. This character is starved by the idiotic trio of Hal, Charles, and Mercedes. For 10 points each:

[10] Name this character who is kidnapped by a gardener in the Santa Clara Valley before being forced to work for the Canadians Francois and Perrault.

ANSWER: **Buck**

[10] Buck is a sled-dog in the Klondike Gold Rush in this Jack London novel.

ANSWER: *The* **Call of the Wild**

[10] This nonfiction book by Jack London, which opens with a chapter titled "The Descent," details his observations of the London slums in the summer of 1902.

ANSWER: *The* **People of the Abyss** <Sy>

3. Judy Kaplan and Linn Shapiro collected memoirs from dozens of people who identified with this pejorative, including Watergate reporter Carl Bernstein. For 10 points each:

[10] Give this pejorative phrase which denotes children raised by Communists or other radical-leftists in mid-20th-century America. It implies that such children, many of them also of Jewish descent, were raised with far-left ideas from shortly after birth.

ANSWER: **red-diaper** babies [or **Red Diapers**]

[10] Another man often dubbed a "red-diaper baby," Abel Meeropol, wrote this anti-lynching song which contrasts the scent of "magnolia, sweet and fresh" with the smell of "burning flesh".

ANSWER: **"Strange Fruit"**

[10] A third so-called "red diaper baby," Robert Meeropol, was the child of this husband-wife spy duo who were sent to the electric chair in 1953 for leaking secrets about the U.S. nuclear program.

ANSWER: Julius and Ethel **Rosenberg** [or the **Rosenbergs**] <Jackson>

4. This technique is a first-order Runge-Kutta method and is thus the simplest method of numerical integration for solving ODEs. For 10 points each:

[10] Name this method that boils down to adding a small amount to the dependent variable when the derivative is positive and subtracting a small amount when the derivative is negative. It's named for the prolific mathematician who explicated it in *Institutionum calculi integralis*.

ANSWER: **Euler's** method [or **Euler's** formula]

[10] Due to its all-around-decent properties, the Runge-Kutta method of this order, in conjunction with an adaptive step-size algorithm, is the most commonly used. The Euler-Bernoulli differential equation for the deflection of a beam has this order.

ANSWER: **fourth** order

[10] The error in the Euler method is proportional to this power of the step size used. Many physical systems that we care about, including the harmonic oscillator, are described by a differential equation of this order.

ANSWER: **second** [or **two**; or **square**; or obvious equivalents] <Voight>

5. One of these two men gossiped that Michel Foucault had called the other's writing style "terrorist obscurantism", prompting the latter to add "Afterword: Toward An Ethic of Discussion" to his essay collection. For 10 points each:

[10] Name these two philosophers whose disagreements over the permanence of intentionality in a speech-act arose from a critique one of them wrote on J.L. Austin's *How to Do Things with Words*, which the other criticized in "Reiterating the Differences". Some of their exchanges are presented in the collection *Limited Inc.*

ANSWER: Jacques **Derrida** and John **Searle** [accept in either order]

[10] The serial misunderstanding of each other's points may be partly attributed to Derrida belonging to the continental tradition while Searle held strongly to this philosophical school articulated by G.E. Moore and Bertrand Russell.

ANSWER: **analytic** philosophy

[10] Searle also expressed derision at this style of critical analysis formulated in Derrida's *On Grammatology*, which aims to undermine the binary oppositions and implicit assumptions of "logocentric" traditional philosophy.

ANSWER: **deconstruction** <Smart>

6. The AATSR instrument was designed primarily to measure this variable and shows big improvements in accuracy over the MODIS and AVHRR instruments. For 10 points each:

[10] Name this variable whose extended elevation and depression off the west coast of South America is characteristic of El Niño and La Niña, respectively.

ANSWER: **sea surface temperature** [or **SST**; prompt on surface **temperature**]

[10] A cool sea surface temperature can be indicative of this process, which is suppressed off Peru by El Niño. This process's occurrence off the west coast of Peru is responsible for their rich anchovy harvests.

ANSWER: **upwelling**

[10] Upwelling is induced in the east of ocean basins near this latitude because the oceans here are subject to a primarily easterly wind stress. The ITCZ is heavily associated with this latitude, which is where the trade winds converge.

ANSWER: **equator** [or **zero** degrees] <Voight>

7. This country's worst nuclear accident came in 1957. For 10 points each:

[10] Name this country which suffered the Windscale Fire while engaging in an attempt to build nuclear weapons. Despite the event ranking a 5 on the 7 point Nuclear Event Scale, no long term health effects took place.

ANSWER: **United Kingdom** [or **UK**; or **England**; or Great **Britain**]

[10] The Windscale Fire did not result in as devastating an impact as this 1986 disaster in the Soviet Union, which was classified as a 7 and killed at least 31 people immediately.

ANSWER: **Chernobyl** disaster

[10] Another deadly environmental disaster in Great Britain was the "Great Storm of 1987," a cyclone that killed at least 20 people. Michael Fish, a BBC weatherman working for this national weather service of Britain, was criticized for jokingly telling viewers not to worry about hurricanes.

ANSWER: **Met Office** [or **Meteorological Office**] <Cheyne>

8. This character claims to be a "society vampire" and tries to impress Warren McIntyre by making a scandalous fashion statement. For 10 points each:

[10] Name this character who returns to Eau Claire at the end of the story named for her, but not before cutting off her cousin Marjorie's pigtails during her sleep.

ANSWER: **Bernice**

[10] The story "Bernice Bobs Her Hair" appears in this author's first story collection, *Flappers and Philosophers*. This author also wrote "The Diamond as Big as the Ritz" and *The Great Gatsby*.

ANSWER: F. Scott **Fitzgerald** [or Francis Scott Key **Fitzgerald**]

[10] This other story from *Flappers and Philosophers* follows Evylyn and Harold Piper, who receive the title piece of kitchenware as a wedding gift.

ANSWER: "The **Cut-Glass Bowl**" <Golimlim>

9. This opera's first act closes with the title character rejecting a potential lover in the aria "Sempre libera." For 10 points each:

[10] Name this Giuseppe Verdi opera which ends with the death of Violetta due to tuberculosis.

ANSWER: **La traviata** [or *The **Fallen Woman***]

[10] *La traviata* opens with a party in which Violetta and Alfredo join in a duet to sing this drinking song beckoning others to enjoy wine, song, laughter, and the beautiful night.

ANSWER: "**Libiamo** ne' lieti calici" [prompt on **brandisi**]

[10] At the end of the first act of *La Traviata*, Violetta gives Alfredo this specific flower and tells him to return it to her when it has wilted. The original novel by Alexandre Dumas, fils that the opera is based on contains this flower in the title.

ANSWER: **camellia** <Kim>

10. This man was the uncle of Marcel Mauss. For 10 points each:

[10] Name this French sociologist who penned *The Rules of Sociological Method* as well as a seminal study on suicide.

ANSWER: David Emile **Durkheim**

[10] Durkheim's study on suicide concluded that higher social control among this religious subgroup resulted in a lower suicide rate than other faiths.

ANSWER: Roman **Catholics** [prompt on **Christians**]

[10] Durkheim described this type of suicide as taking place when people felt excessively regulated or oppressed. This type of suicide frequently takes place in prisons where people can no longer take abuse.

ANSWER: **fatalistic** suicide <Cheyne>

11. This hero enlists the help of Mabon ap Modron, the only man capable of taming Drudwyn (**DROOD-"win"**), the only hound capable of hunting the boar Twrch Trwyth (**TOORK troo-"WITH"**). For 10 points each:

[10] Name this cousin of King Arthur, who is given an absurd amount of tasks to complete before he is permitted to marry Ysbaddaden's (**ISS-bah-DAH-den's**) daughter.

ANSWER: **Culhwch** ("KILL hook")

[10] Among the men in Culhwch's army is the knight Bedivere, who is later tasked with returning this sword to the Lady of the Lake.

ANSWER: **Excalibur** [or **Caliburn**]

[10] This knight, originally a kitchen boy, defeats the Red Knight of the Red Lands and wins the heart of Lyonesse. Later, he unknowingly defeats his own brother Gawain in single combat.

ANSWER: **Gareth** [or **Guerrehet**; prompt on **Beaumains**] <Kim>

12. Answer the following about Lake Champlain's storied military history, for 10 points each:

[10] This fort on the southern end of Lake Champlain was captured by Ethan Allen's Green Mountain Boys in an early Revolutionary War action.

ANSWER: Fort **Ticonderoga**

[10] This general assisted Ethan Allen during the capture of Fort Ticonderoga. He also commanded a fleet in Lake Champlain that was decisively defeated, but was successful in stalling Guy Carleton's plans to take the Hudson River valley.

ANSWER: Benedict **Arnold**

[10] During the French and Indian War, Robert Rogers allegedly escaped a battle near Lake Champlain by sliding 400 feet down a rock face. That battle is nicknamed for these pieces of clothing worn by Rogers' Rangers.

ANSWER: **snowshoes** <Golimlim>

13. This composer was one of the first to write serious wind ensemble music, with his two suites for military band. For 10 points each:

[10] Name this Englishman who adapted the finale of his *Second Suite in F for Military Band*, "Fantasia on the Dargason", for his later *St. Paul's Suite*.

ANSWER: Gustav **Holst**

[10] This composer, who attempted to write a sonata for every instrument of the orchestra, wrote his *Symphony in B Flat* for wind band.

ANSWER: Paul **Hindemith**

[10] This march for wind band, written by John Philip Sousa in tribute to the American flag, may be best-known for the piccolo solo in its trio section.

ANSWER: *The **Stars And Stripes Forever*** <White>

14. Patients with chronic granulomatous disease have difficulty producing an anion of this element. For 10 points each:

[10] Name this element whose reactive minus-one diatomic anion is partitioned by a namesake dismutase. Three of this element are in ozone.

ANSWER: **oxygen** [or **O₂**; or **superoxide**; or **peroxide**]

[10] A namesake oxidase of this compound produces superoxides. This reducing agent is made in the oxidative phase of the pentose phosphate pathway.

ANSWER: **NADPH** [or **nicotinamide adenine dinucleotide phosphate**; or **NADP-plus**]

[10] Superoxides can lead to this disease by oxidizing intima lipoproteins, which macrophages then engulf to turn into foam cells.

ANSWER: **atherosclerosis** [or **atherosclerotic** plaques; or **plaque buildup** in arteries] <Smart>

15. The first king of this dynasty fathered Prince Henry the Navigator. For 10 points each:

[10] Name this dynasty that ended when a neighboring country's Philip II absorbed the country it ruled into the Iberian Union.

ANSWER: House of **Aviz** [or **Aviz** Dynasty]

[10] This country, which was ruled by the Houses of Aviz and Braganza, abolished its monarchy in 1910.

ANSWER: **Portugal** [or **Portuguese** Republic; or Republica **Portuguesa**]

[10] At this battle that secured Portuguese independence, the founder of the Aviz Dynasty, John I, defeated Castilian forces sent by a different John I.

ANSWER: Battle of **Aljubarrota** <Golimlim>

16. Betz's law calculates the maximum power that can be extracted using these structures, which are termed VAWT or HAWT depending on their rotational axis. For 10 points each:

[10] Name these structures that convert energy from a renewable resource into electricity using aerodynamic rotor blades. Groups of these structures are found on namesake onshore and offshore farms.

ANSWER: **wind turbines** [or **aerofoil-powered generators**; prompt on **windmills**]

[10] Blade pitch is controlled by adjusting this quantity representing the relationship between a reference line and flow direction. The maximum lift coefficient is produced by its "critical" value, above which stalling occurs.

ANSWER: **angle of attack** [or critical **angle of attack**; or **attack angle**; prompt on **angle**]

[10] At high angles of attack, the speed of the fluid in this viscous region relative to the blade can reverse due to an adverse pressure gradient, resulting in flow separation and von Karman vortex streets.

ANSWER: **boundary layer** <Smart>

17. In this novel, the inhabitant of Satis House wears the dress from her wedding, where she was abandoned by Compeyson. For 10 points each:

[10] Name this novel about Pip, who falls in love with Estella but is spurned by her because she has been trained to hate men by Miss Havisham.

ANSWER: **Great Expectations**

[10] In *Great Expectations*, Abel Magwitch is able to become Pip's benefactor after making his fortune in this modern-day country.

ANSWER: **Australia**

[10] Dickens's own travels brought him to this country in 1842, writing an unflattering "Notes for General Circulation" about his trip, which included a visit to Pete Williams's dance house.

ANSWER: **United States** of America [or United States of **America**] <Sy>

18. This nickname is given to the confluence of the Ruak and Mekong Rivers in northern Thailand. For 10 points each:

[10] Give this nickname that describes the collective countries of Thailand, Laos, and Myanmar, known for their lucrative production of opium.

ANSWER: **Golden Triangle**

[10] The delta of this major Chinese river is also nicknamed the "Golden Triangle." The Three Gorges Dam on this river is the world's largest source of hydroelectric power.

ANSWER: **Yangtze** River [or **Chang** Jiang]

[10] Delhi, Agra, and the "pink city" Jaipur, the capital of this state, comprise India's "Golden Triangle" of tourism. This state contains most of the Thar Desert.

ANSWER: **Rajasthan** <Golimlim>

19. This man was "obsessed by this image of pain" from a 1905 photo of the *lingchi* execution method shown in his last book, *The Tears of Eros*. For 10 points each:

[10] Name this French intellectual who described the sexual adventures of Simone and Marcelle in a novella titled for the body part removed from a strangled priest, *Story of the Eye*.

ANSWER: Georges **Bataille** [or Georges Albert Maurice Victor **Bataille**]

[10] Bataille called himself an "enemy within" this European artistic movement, whose founder called it "pure psychic automatism." This movement seeks to represent the logic of dreams.

ANSWER: **surrealism**

[10] This founder of surrealism and author of the *Surrealist Manifesto* used automatic writing to pen *The Magnetic Fields* with Philippe Soupault.

ANSWER: Andre **Breton** <Yu>

20. Swans swim amidst an embracing naked old man and young beauty in the counterpart to this painting, to which a coffin was added for the smaller "New York" version painted for the widow Marie Berna. For 10 points each:

[10] Name this painting, in which precipitous cliffs surround tall dark cypresses, the masterwork of Swiss artist Arnold Böcklin.

ANSWER: *The **Isle of the Dead*** [or *Die **Toteninsel***]

[10] *The Isle of the Dead* was part of this loosely-defined mid to late-nineteenth century artistic tradition, whose painters heavily used dream imagery and employed obscure mythological allusions. Gustave Moreau was part of this tradition, which was coterminous with a literary movement of the same name.

ANSWER: **Symbolism** [or word forms, such as **Symbolist**]

[10] The *Frieze of Life* series by this Symbolist artist includes vaguely mythological and dream-like images like *Ashes* and *The Scream*.

ANSWER: Edvard **Munch** <Gupta>

21. Quartet puzzling can interpret larger data sets of taxa than the stepwise addition and branch swapping used in other maximum-likelihood heuristic search algorithms for these objects. For 10 points each:

[10] Name these branching evolutionary diagrams that may be rooted using a molecular clock or outgroups.

ANSWER: phylogenetic **tree** [or evolutionary **tree**; or directed **tree**; or **dendrogram**; or **cladogram**; or **phylogeny**]

[10] The posterior probability of a tree being "true" equals the product of the prior probability P of A of a tree and the likelihood of data B given A according to an interpretation of this man's namesake theorem.

ANSWER: Thomas **Bayes** [or **Bayesian**]

[10] 15 *unrooted* binary trees can be constructed from five tips. Give the number of *unrooted* binary trees that can be constructed out of *three* tips.

ANSWER: **one** <Smart>