



NASAT 2016
Round 6

1. In the Athenian Bouphonia festival, an ax that had been used to slay an ox was subjected to one of these events and thrown into the sea. The first one of these events occurred after Halirrhothius was killed for assaulting Alcippe. During one of these events, Apollo gave a speech about the supremacy of paternal rights, because men "plant the seed"; that one of these events was decided by Athena, setting a tradition for Athenian events of this type. Ares was the subject of the first of these events, which, like a later event of this sort experienced by Orestes, occurred on the Areopagus hill. For 10 points, Aeacus (EE-uh-cuss), Rhadamanthus, and Minos's role in Hades is to judge what sorts of legal proceedings?

ANSWER: trials [or judgements until "judge" is read; or obvious equivalents; prompt on legal proceedings until read] <Brownstein>

2. With his wife, Alicia Patterson, a member of this family founded the newspaper *Newsday*. This was the alphabetically first of the two families that partnered to build the Million Dollar Bridge to transport copper from the town of Kennicott. Fifteen employees of a company owned by this family were killed by Pancho Villa's men in an attack on a train near Santa Isabel. A member of this family supported Richard Ballinger in the Cunningham claims dispute, and, along with J. P. Morgan, formed the Alaska Syndicate. Its patriarch, Meyer, acquired the American Smelting and Refining Company. A member of this family named Solomon befriended Hilla von Rebay, leading to an interest in contemporary art. For 10 points, name this family that commissioned Frank Lloyd Wright to design a New York City museum.

ANSWER: Guggenheim family <Droge>

3. This artist restaged many of George Dureau's images of dwarfs and amputees. In an expensive photograph by this artist, four silk panels surround a platinum print on linen, depicting Andy Warhol. In a departure from his usual subject matter, this photographer shot many close-ups of calla lilies. This photographer's *Black Book* has been criticized for its exploitative fetishization of black men. Restrictions on National Endowment of the Arts grants were enacted after it had funded a retrospective for this photographer at the Corcoran Gallery, called *The Perfect Moment*, soon after his 1989 death of complications from AIDS. For 10 points, name this American artist who took extremely sadomasochistic and homoerotic photographs.

ANSWER: Robert Mapplethorpe (MAPLE-thorp) <Gupta>

4. In a novel by this author, a character's claim that her entire family is dead is shown to be a lie when her entire family arrives from Madrid, Texas. A character created by this author rants at her stepmother after finding her mother's old breadboard has been ruined. In a story by this author, the narrator is woken up at 6:30 a.m. when her uncle throws firecrackers in her room. A novel by this author centers on the death and funeral of a Mount Salus judge, who dies while recovering from an eye surgery in New Orleans. A story by this author is set on the Fourth of July after Stella-Rondo returns home with the two-year-old Shirley-T. For 10 points, name this Mississippian author of *The Optimist's Daughter* and "Why I Live at the P.O.".

ANSWER: Eudora **Welty** <Collins>

5. Using the air mass, or AM, one-point-five model, the theoretical efficiency of these devices is capped at around 33.7 percent. A groundbreaking one of these devices consisted of a TCO layer of aluminum-doped zinc oxide over the quaternary compound CIGS, and was fabricated via the superstrate configuration. Their tandem form features semiconductors with different bandgaps, greatly increasing efficiency. Though not related to imaging, the efficiency of these devices is in direct proportion to their fill factor. The fastest payback for these devices comes from their thin-film cadmium telluride variety. The most common example of these devices is a simple silicon p-n junction in which electrons are excited by incident photons. For 10 points, identify these devices that convert sunlight into electricity.

ANSWER: **solar cells** [or **photovoltaic cell**; or **PV cell**; do not accept "photocells" or "photoelectric cells" or "PE cells"] <Voight>

6. This writer wrote about a man and "his last gruel of winter seeds caked in his stomach" in a poem concluding, "In the old man-killing parishes I will feel lost, unhappy and at home". Another of his poems describes how "bubbles gargled delicately, bluebottles wove a strong gauze (goz) of sound around the smell". In addition to writing about wanting to go to Aarhus (AR-hooss) to see the "peat-brown head" of "The Tollund Man", this poet wrote about a "rat-grey fungus" that leads the speaker to conclude, "It wasn't fair that all the lovely canfuls smelt of rot". This poet of "Blackberry-Picking" wrote about the death of his younger brother in a poem ending, "A four foot box, a foot for every year". For 10 points, name this Irish poet who included "Mid-Term Break" in *Death of a Naturalist* and translated *Beowulf*.

ANSWER: Seamus **Heaney** (SHAY-mus HEE-nee) [or Seamus Justin **Heaney**] <Adams>

7. A. P. Flitney and Derek Abbott discussed the quantum variation of this problem, discovering that if Alice has access to quantum strategies, then probabilities do not change, but if the particles are maximally entangled, a classical strategy is still the best strategy for Bob. The same logic used to resolve this conundrum can also be used to resolve the paradox proposed by Joseph Bertrand, which involves three gold coins and three silver coins. This problem, which was recast by Martin Gardner using prisoner, execution, and freedom, centers on two goats. Conditional probability shows that "one-half" is the answer to this problem if another door is chosen after being asked by the namesake person to swap doors. For 10 points, name this probability problem named for the host of *Let's Make a Deal*.

ANSWER: **Monty Hall** problem <Jose>

8. The revealed letters of Kenneth de Courcy speak of a plot that would have undone the primary outcome of this event. The lawyer John Goddard represented one party in this event, though he cautioned against further legal action because of a possible "citizens' intervention". After this event, its main subject traveled to Austria and went on to become Governor of the Bahamas during World War II. Stanley Baldwin forced this event by declaring a morganatic arrangement unacceptable. George VI ascended to the throne after this event, which was caused by the current king's desire to marry the divorcee Wallis Simpson. For 10 points, name this event in which the reigning British monarch in 1936 renounced his claim to the throne.

ANSWER: **abdication** of **Edward VIII** [prompt on the Abdication Crisis, accession of George VI, or descriptive answers, such as Edward VIII stepping down] <Droge>

9. After writing down the names of 77 officials of a town, this man punishes them "with desert thorns and briars". His son was the subject of a parable about a thornbush becoming the king of the other trees. He's not Greek, but this man's son was killed when a woman threw a millstone on his skull. This leader was told to dismiss any man who did not drink water by lapping it like a dog. Also known as "Jerubbaal", this person had a dictatorial son who ruled Shechem named Abimelech. After putting out a fleece and asking God to give him signs, this man destroyed an altar of Baal. With only a force of 300 men, this man used trumpets and torches to confuse and defeat a much larger Midianite force. For 10 points, what Old Testament judge names a group which hands out free Bibles?

ANSWER: **Gideon** [or **Jerubbaal** until read] <Cheyne>

10. ABC News reporter Brian Ross was cited in District Court for illegally trying to interview this man in June 2016 while he was walking to an elevator. In the parking lot of a funeral home, this man was reportedly told by Jolene Burdge that "your secret didn't die in there with my brother". Fuels America terminated its contract with the lobbying firm Dickstein Shapiro after this man resigned from it in May 2016. That resignation occurred after he was indicted for unlawfully structuring large cash withdrawals as part of a scheme to pay a person known as "Individual A". That investigation led to 2016 revelations that this man had sexually molested boys while working as a high school wrestling coach. For 10 points, name this now disgraced former Speaker of the House from Illinois.

ANSWER: Dennis "Denny" **Hastert** [or John Dennis **Hastert**] <Cheyne>

11. Late in his career, this thinker collaborated with Charles Benight in various articles challenging the diathesis-stress model's application to depression and PTSD. This psychologist developed a type of therapy by working with people afraid of snakes and inviting them to drape a snake over their neck. In a 1997 book, this thinker described the title belief as what "you believe you can do with what you have". That book, *Self-Efficacy*, expanded this person's landmark text on social cognitive theory titled *Social Foundations of Thought and Action*. This originator of social learning theory observed how children imitated adult models who yelled things like "Sock him!" while attacking an inflatable object painted like a clown. For 10 points, what psychologist conducted the Bobo doll experiment?

ANSWER: Albert **Bandura** <Cheyne>

12. A guerrilla group in this nation, which was led by a man known as the "Bronze Titan", employed a tactic dubbed the "machete charge". Arsenio Martínez Campos tried to contain an uprising in this nation by constructing a defensive *trocha* from Júcaro to Morón. Calixto García and Antonio Maceo were leaders of this nation's *mambises* (mom-BEE-says) who fought in a short-lived uprising here, the Little War. The Pact of Zanjón ended a war in this nation that began when Carlos Manuel de Céspedes issued the "Cry of Yara". This nation's peasants were forced into concentration camps by Valeriano "Butcher" Weyler. This country's independence movement fought the Ten Years' War against Spain. For 10 points, name this island nation where the *USS Maine* exploded in Havana Harbor.

ANSWER: Republic of Cuba [or Republica de Cuba] <Kendrick>

13. The first modern artwork of this type was created in a medium composed of wax, resins, gasoline, and oils, called the namesake "color" of a pseudonymous artist. A rotating stage in a "Polyforum Cultural" allows visitors to experience a large example of these artworks showing a man emerging from an *amate* tree. Dr. Atl taught an artist who depicted vultures wearing clerical collars and a skeleton giving birth in an artwork of this type. Four propeller-like shapes surround an orb held by a fist, inside of which a cell divides, in an artwork of this type that was destroyed because of its Lenin imagery. For 10 points, name these artworks made by David Siqueiros, José Clemente Orozco, and Diego Rivera, that were directly painted on surfaces.

ANSWER: Mexican murals [prompt on frescos, since many of these were painted using fresco] <Gupta>

14. Thermolysin conjugates four calcium ions and an ion of this element. TIMPs inhibit proteins that coordinate this element called matrix metallo-proteinases. The Really Interesting New Gene domain binds to two ions of this element. As in TALENs, *Fok*-one restriction enzymes are fused with proteins binding to this element to perform genome editing. This element coordinates with three imidazole (ih-mih-DA-zohl) rings in the active site of carbonic anhydrase. A class of proteins binding this element includes fold groups called treble clef and gag knuckle. It is bound by cysteine and histidine (HISS-tuh-deen) residues in proteins that grab onto substrates like DNA in namesake "finger" domains. For 10 points, name this element with atomic symbol Zn.

ANSWER: zinc [or Zn until it is read] <Smart>

15. The speaker of this poem still sighs for a "dark downward and vegetating kingdom" that has been destroyed. This poem describes a man who is "as lean as a compass needle" and "has an angry wrenlike vigilance, a greyhound's gentle tautness". This poem describes some "yellow dinosaur steamshovels" that "were grunting as they cropped up tons of mush and grass to gouge their underworld garage". This poem, set in a "Sahara of snow" where an aquarium used to be, ends with the lines, "a savage servility slides by on grease". This poem's speaker recalls how William James "could almost hear the bronze Negroes breathe" at the dedication of the monument it describes. For 10 points, name this poem about the Robert Gould Shaw Memorial in Boston written by Robert Lowell.

ANSWER: "For the Union Dead" <O'Rourke>

16. Followers of this man believed his right foot had the power to heal people's spleens. This king appointed Gauls to oversee the city of Aegae (EYE-guy) he captured after the Battle of the Aous River, but they angered the people by digging up ancient tombs. His son Ptolemy was slain during a failed attempt to put Cleonymus on the throne instead of Areus. This man died after a failed siege of Sparta in Argos after the mother of a soldier threw a tile that knocked him from his horse. When this man left Tarentum, he mused on the battlefield he was leaving for Carthage and its current uneasy ally. After winning the Battle of Asculum against the Romans, he commented, "one more such victory and we are undone". For 10 points, what Greek king of Epirus gives his name to victories in which the winner suffers devastating losses?

ANSWER: **Pyrrhus** of Epirus <Cheyne>

17. An editor of this publication wrote the editorial "A Book for Burning?", in which he argued that Rupert Sheldrake produced "the literature of intellectual aberrations". That editor of this publication also wrote the 1983 editorial "No Need for Panic about AIDS". It currently prints short stories called "Futures". Norman Lockyer created this publication in 1869 and named it for a line from a Wordsworth poem. Its article "Coping with Peer Rejection" admitted mistakes like rejecting the work of Robert Huber and Hartmut Michel. In 1997, this British publication printed a landmark article about Dolly the sheep, and in 1953, it published Watson and Crick's paper explaining the structure of DNA. For 10 points, what publication, along with *Science*, is the world's most cited scientific journal?

ANSWER: **Nature** <Cheyne>

18. This composer included a minor-key episode marked "Im Legendenton" (LAY-gun-DENT-in), or "in the style of a legend", in the first movement of a three-movement piano fantasy in C major. He wrote a set of piano etudes in the form of a theme, nine variations, and a finale. Easy pieces such as "Knecht Ruprecht" and "The Merry Farmer" are found in his *Album for the Young*. This composer used an "A E-flat C B" motif in a piece where the fiery and docile sides of his personality are contrasted in back-to-back movements titled "Florestan" and "Eusebius". The dream of a young child is the subject of the "Träumerei" (TROWM-rye) movement of his *Kinderszenen* (kin-dust-SANE-in). For 10 points, name this composer whose *Carnaval* includes a movement depicting his wife Clara.

ANSWER: Robert **Schumann** <Kim>

19. This thinker used the example of a slave who must hold a chamberpot for his master to argue that what is unbearable differs from person to person. This thinker, who famously thought that one must behave in life as at a dinner party, argued that students ought to study the disciplines of desire, action, and assent as part of his "doctrine of the three topics". This thinker's assertion that "some things are in our control and some are not" formed that basis of his distinction between the *prohairesis* and the *aprohairesis*. Marcus Aurelius' *Meditations* frequently quotes this thinker whose sayings were collected by his student Arrian into the *Enchiridion*. For 10 points, name this late Stoic philosopher whose teachings are collected in his *Discourses*.

ANSWER: **Epictetus** <Kendrick>

20. In this novel, an army corporal uses the term "Structural Oblique Formations" to refer to a piece of installation art he has created, which is actually just a series of pillboxes. The narrator of this novel is unsure whether to end it with his thirtieth birthday or with a scene in which he is arrested as he travels up an escalator. A character in this novel is about to choke to death on a pin when he is shot by some soldiers in a basement. This novel's protagonist finds the finger of the murdered Sister Dorothea in a field, a crime for which he is confined to an asylum. Its protagonist is able to shatter glass with the sound of his voice and refuses to grow up at the age of three. For 10 points, name this novel about Oskar Matzerath, who beats the title instrument, written by Gunter Grass.

ANSWER: *The Tin Drum* [or *Die Blechtrommel*] <Droge>

21. A character in this poem "moves in darkness" that is greater than that of the woods or that of the "shade of trees". This poem derides hunters by claiming that "they would have the rabbit out of hiding to please the yelping dogs". This poem's speaker emphatically declares, "Stay where you are until our backs are turned!" in describing a sort of "outdoor game" that only has one player on either side. This poem describes boulders as being sometimes shaped like loaves and sometimes shaped like balls. This poem's talkative speaker walks with a surly neighbor who twice recites his father's saying that "Good fences make good neighbors". For 10 points, name this poem about fixing a barrier by Robert Frost.

ANSWER: "Mending Wall" <Droge>

1. An oasis in this desert named Merv renamed itself after the Virgin Mary. For 10 points each:

[10] Name this Asian desert whose name translates as "black sand". It contains the "Door to Hell", a pit home to an ongoing massive natural gas fire.

ANSWER: **Karakum** Desert

[10] The massive Karakum Canal, which was so poorly built that much of its water leaks out, irrigates this capital city of Turkmenistan.

ANSWER: **Ashgabat**

[10] The shoddy construction of the Karakum Canal played a role in the evaporation of much of this lake, which was once the world's fourth-largest. Kazakhstan and Uzbekistan share its paltry remains.

ANSWER: **Aral** Sea <Golimlim>

2. Natarajan Shankar verified this result using a program called Nqthm. For 10 points each:

[10] Name this theorem named for Kurt Gödel (GER-tle), who proved it, stating that for any axiomatic system, there are certain results that are true—but unprovable within the system.

ANSWER: Gödel's first **incompleteness** theorem

[10] This mathematician's namesake trick allows one to prove Gödel's incompleteness theorem by not assuming omega-consistency. With Stephen Kleene (KLEE-nee), he names a paradox stating that the lambda calculus is inconsistent.

ANSWER: John **Rosser**

[10] Another result about the inherent limitations of logic was Alonzo Church's proof that this mathematician's *Entscheidungsproblem* (en-CHIDE-oongs-problem) is unsolvable. He also proved a "basis" theorem stating that polynomial rings over Noetherian (ner-TARE-ee-in) rings are also Noetherian.

ANSWER: David **Hilbert** <Jose>

3. This goddess's drunken dance of victory is interrupted only when she realizes she is trampling over the body of her husband. For 10 points each:

[10] Name this goddess who devours the wicked Raktabija after using her lengthy tongue to lick up his demon-creating blood.

ANSWER: **Kali** [prompt on Durga; do not accept "Kalki"]

[10] Kali is a violent aspect of this all-encompassing feminine force in Hinduism, which primarily manifests as the powerful demon-slaying Durga.

ANSWER: **Devi** (DAY-vee) [or **Shakti**]

[10] This Hindu god of destruction is the husband of Devi's gentler aspect Parvati.

ANSWER: **Shiva** [or **Shiv**] <Kim>

4. One of these two men was murdered by an extortionist named Edward Stiles Stokes. For 10 points each:

[10] Name these two robber barons who managed to devastate the United States economy by attempting to corner the gold market on Black Friday, 1869.

ANSWER: Jason "Jay" **Gould** AND James **Fisk** Jr.

[10] Black Friday was an early incident during the presidential administration of this former Civil War general whose presidency featured scandals such as the Whiskey Ring.

ANSWER: Ulysses S. **Grant** [or Hiram Ulysses **Grant**]

[10] The year before, Gould had become head of this northeastern railroad after winning a contentious battle with men like Cornelius Vanderbilt. While Gould was fighting for control of this railroad in 1873, he led a posse into Canada in an attempt to extradite a con-man known as "Lord Gordon-Gordon".

ANSWER: **Erie** Railroad <Cheyne>

5. At the start of this novel, a man dies dancing during carnival celebrations while he has a cassava tuber stuffed up his skirt. For 10 points each:

[10] Name this novel in which the title character's two sexual partners are a pharmacist who enjoys playing the bassoon and a man who returns as a ghost on the first anniversary of her remarriage.

ANSWER: ***Dona Flor and Her Two Husbands*** [or ***Dona Flor e Seus Dois Maridos***]

[10] *Dona Flor and Her Two Husbands* was written by this author of *The Violent Land* and *Gabriela, Clove and Cinnamon*.

ANSWER: Jorge **Amado** (JOR-jee uh-MAH-doo)

[10] Jorge Amado is a writer from this South American country's city of Ilhéus (eel-YAY-oos). He used its region of Bahia (bah-EE-uh) as the setting for many of his novels.

ANSWER: **Brazil** <Droge>

6. In the Allegretto second movement of this symphony, the coda begins when all instruments drop out, leaving the second trumpet to perform a short fanfare. For 10 points each:

[10] Name this G major symphony by Joseph Haydn that evokes Turkish Janissary bands with an expanded percussion section that includes a triangle, a bass drum, and a pair of cymbals.

ANSWER: ***Military*** *Symphony* [or *Symphony No. 100 in G major*]

[10] The nickname for this other Haydn symphony originates from the unexpected LOUD chord at the end of an otherwise quiet theme that opens its second movement.

ANSWER: ***Surprise*** *Symphony* [or *Symphony No. 94 in G major*]

[10] This author explored the development of 18th-century music from Haydn to Mozart and Beethoven in his 1971 book *The Classical Style*.

ANSWER: Charles **Rosen** [or Charles Welles **Rosen**] <Kim>

7. After hitting his lover with a camera, this character leaves her to drown after their boat capsizes in Big Moose Lake. For 10 points each:

[10] Name this character who is executed in the electric chair for the murder of Roberta Alden.

ANSWER: **Clyde** Griffiths [or Clyde **Griffiths**]

[10] Clyde Griffiths appears in *An American Tragedy*, a novel by this author who also wrote *Sister Carrie*.

ANSWER: Theodore **Dreiser**

[10] In the first part of the novel, Clyde moves up the economic ladder from soda-jerk to working at one of these establishments in Kansas City, earning up to six or seven dollars a day in tips.

ANSWER: **hotel** <Pari>

8. You are a toddler looking at a star in the sky and you see it twinkle. For 10 points each:

[10] You are looking at it using this kind of telescope, which uses mirrors to produce an image, unlike a refracting telescope.

ANSWER: **reflecting** telescope [or **reflector**]

[10] The star twinkles because of this phenomenon, by which the Earth's atmosphere distorts wavefronts.

ANSWER: astronomical **seeing** [*do not read*, but prompt on **turbulence**]

[10] Astronomical seeing is caused by this phenomenon in the Earth's atmosphere. A theory of it at small length scales was proposed by Andrei Kolmogorov.

ANSWER: **turbulence** [or **turbulent** flow; or word forms] <Jose>

9. One of these artworks depicts peasants shearing sheep and harvesting wheat beneath the faithfully-depicted Château de Clain, a now-destroyed castle. For 10 points each:

[10] Name this type of illuminated manuscript containing a collection of prayers to be said at various intervals during the day. The best-known one was illustrated by the Limbourg brothers for John, Duke of Berry.

ANSWER: Book of **Hours** [or Tres Riches **Heures**]

[10] Books of Hours were crucial to the development of this major division of Western painting, since they often depicted very small figures amidst large nature scenes.

ANSWER: **landscapes**

[10] This 15th-century French painter created a Book of Hours for treasurer Étienne Chevalier (shuh-vall-YAY). He is better known for his *Melun Diptych*, in which Jesus and Mary, whose spherical breasts appear to the sides of her chest, are surrounded by a throng of red and blue angels.

ANSWER: Jean **Fouquet** (foo-KAY) [or Jehan **Fouquet**] <Gupta>

10. This dynasty's founder, Ludovico I, was given the nickname "people's captain". For 10 points each, [10] Name this house that ruled Mantua from the 14th to 18th centuries. A scholar from this house is the namesake of a Jesuit university founded in Washington.

ANSWER: House of **Gonzaga**

[10] Many Gonzaga rulers were described by this Italian term for a mercenary captain in medieval and Renaissance times. Bartolomeo Colleoni, who fought for Venice, was also one of these people.

ANSWER: **Condottieri**

[10] This wife of Francesco Gonzaga from Ferrara was an important patron of the Renaissance and apparently had a special fascination with black children.

ANSWER: Isabella **d'Este** <Droge>

11. Frank Ramsey first presented this argument in his paper "Truth and Probability". For 10 points each:

[10] Name this argument for probabilism which argues that a rational agent cannot hold credences that violate the axioms of non-negativity, normalization, and finite additivity since he would get cleaned out by a bookie.

ANSWER: **Dutch book** arguments [or **DBAs**]

[10] Frank Ramsey's paper "Facts and Propositions" is credited with introducing the disquotational theory of this concept, contrasted with falsity.

ANSWER: **truth**

[10] This philosopher developed a "semantic" theory of truth which holds that truth can only be assessed in an object language using a larger metalanguage of which the object language is a subset.

ANSWER: Alfred **Tarski** <Kendrick>

12. During the 1970s, the USDA's executive cafeteria was sarcastically dedicated in honor of this man. For 10 points each:

[10] Name this man who supposedly killed and ate his five traveling companions after getting stuck during a winter trip. His forty year sentence for manslaughter was, at the time, the longest custodial sentence in United States history.

ANSWER: Alfred "Alferd" **Packer**

[10] Packer's cannibalistic spree took place in this modern day state, the site of the 1864 Sand Creek massacre. This state was home to the infamously lawless town of Leadville.

ANSWER: **Colorado**

[10] Packer's desperation recalls the cannibalism engaged in by this group of pioneers who set out by wagon for California and got trapped in the Sierra Nevada during winter. 48 out of 87 members of this party survived.

ANSWER: **Donner** Party [or **Donner**-Reed Party] <Cheyne>

13. This character tells his story through letters sent to his sister, Margaret Seville. For 10 points each:
[10] Name this character, a youthful sea captain who spots a gigantic figure in a dog sled and later another man almost frozen to death. This character rescues the latter man, who eventually dies after telling his own story.

ANSWER: **Robert** Walton [or Robert **Walton**]

[10] Robert Walton serves as the frame narrator of this Mary Shelley novel about a scientist who creates a monster.

ANSWER: **Frankenstein**; or *The Modern Prometheus*

[10] The Frankenstein Monster becomes murderous and vows to revenge himself on Frankenstein after the scientist breaks his promise to do this for him.

ANSWER: **create a mate** for him [or **make a wife** for him; or obvious equivalents] <Cheyne>

14. The redox midpoint potential of a complex in this pathway is increased by UHDBT and stigmatellin. For 10 points each:

[10] Name this pathway in which heme bH reduces another molecule to yield the unstable radical semiquinone, which it further reduces to form ubiquinol.

ANSWER: **electron transport chain** [or **ETC**; prompt on oxidative phosphorylation or mitochondrial respiratory chain]

[10] Myxothiazol competitively inhibits ubiquinol from being oxidized by a Rieske protein by binding to the Q-zero site of this enzyme complex.

ANSWER: **cytochrome bc1** [or **coenzyme Q-cytochrome c oxidoreductase**; or complex **3**; or **ubiquinol-ferricytochrome-c oxidoreductase**; prompt on partial answers, such as cytochrome b]

[10] The Rieske protein subunit of cytochrome bc1 is comprised of sulfur and this metal coordinated with cysteine and histidine residues. Other namesake proteins with sulfur and this metal are aconitase and ferredoxins.

ANSWER: **iron** [or **Fe**] <Smart>

15. A road in Ōsaka lined with benches shaped like these instruments honors the historical contributions of the *burakumin* underclass in manufacturing them. For 10 points each:

[10] Name these instruments, Japanese examples of which are called *taiko*.

ANSWER: **drums**

[10] Taiko drums, color-coded to the experience level of the player, as well as masks, are elements of this form of Japanese theater dating to the 14th century.

ANSWER: **Noh** [or **Nōgaku**]

[10] In one of many parallels between taiko and martial arts, the drummers will sometimes perform this action, which goes by names such as *kakegoe* (kah-KENG-goh-eh) or *kiai* (kee-AH-ee).

ANSWER: they **shout** [or **yell**; or synonyms] <Gupta>

16. Answer some questions about catalysts, for 10 points each.

[10] Catalytically perfect enzymes are said to be limited by this process, which transports substrate or product in or out of the active site. Fick developed three laws describing the rate of this process.

ANSWER: **diffusion**

[10] This measure of catalytic activity, written h -sub-big T , is proportional to the square root of the reaction rate divided by diffusion rate.

ANSWER: **Thiele modulus**

[10] Crown ethers are an example of a catalyst that transfers reactants between these things; in the crown ether case, between the organic and aqueous layers of a reaction mixture.

ANSWER: **phase transfer** catalysts <Nagari>

17. This institution is currently led by Peter Gilmore, who says its members are "skeptical atheists" and do not actually believe in the namesake supernatural being. For 10 points each:

[10] What religious institution was established at San Francisco's Black House by Anton LaVey? It believes the being in its name represents human pride.

ANSWER: The **Church of Satan**

[10] Various monotheist extremists inaccurately argue this religious group worships Satan because of this group's veneration of Melek Taus, the Peacock Angel, who shares similarities to both Muslim and Christian conceptions of Satan.

ANSWER: **Yazidis**

[10] ISIL gives Yazidis the option of converting to this largest denomination of Islam or dying. It is much larger than the second largest denomination, Shia Islam.

ANSWER: **Sunni** Islam <Cheyne>

18. This monarch may have lived just long enough to witness the conclusion of his army's successful siege of Bursa. For 10 points each:

[10] Name this ruler who took Malhun Hatun as his first wife and established the Ottoman Empire.

ANSWER: **Osman I** [or Ertuğruloğlu **Osman** Gazi; or **Othman I**; prompt on **Osman** or **Othman**]

[10] Osman fought against the forces of this empire, including the mercenary party of the Catalan Company. This empire's last ruler, Constantine XI, was defeated by the Ottomans in 1453.

ANSWER: **Byzantine** Empire

[10] An anonymous poem attributed to Osman describes a dream in which one of these objects encompasses the great mountain ranges and rivers of the world.

ANSWER: **tree** [prompt on **plant**] <Droge>

19. This object seems to wink at the protagonist before he goes mad. For 10 points each:

[10] Name this object from a Russian short story which inexplicably appears instead of an ace during a high-stakes card game played by the officer Hermann. Its unwelcome appearance bankrupts Hermann.

ANSWER: The **Queen of Spades**

[10] "The Queen of Spades" is a short story by this author, who also wrote the verse novel *Eugene Onegin*.

ANSWER: Alexander **Pushkin** [or Alexander Sergeyevich **Pushkin**]

[10] One of Pushkin's "Little Tragedies" is about these two real-life artists. That short play by Pushkin also inspired a 1979 Peter Shaffer play about these two artists.

ANSWER: Wolfgang Amadeus **Mozart** AND Antonio **Salieri** [accept in either order] <Cheyne>

20. Answer the following about the writings of Jon Krakauer, for 10 points each.

[10] Krakauer's most recent book is set in and titled for what college town? The book argues that this town's local law enforcement take an indifferent stance towards the plight of rape victims.

ANSWER: **Missoula**, Montana

[10] Krakauer wrote the book *Where Men Win Glory* about this former NFL player who died in a friendly fire incident while fighting in Afghanistan in 2004?

ANSWER: Patrick Daniel **Tillman**

[10] Krakauer's book *Into Thin Air* was about a disaster befalling an expedition to climb this mountain in 1996. Sir Edmund Hillary and Tenzing Norgay made the first official ascent of it in 1953.

ANSWER: Mount **Everest** [or **Sagarmatha**; or **Chomolungma**] <Cheyne>

21. A ship named the *Kurtulus* provided aid from one of these two countries to the other. For 10 points each:

[10] Name these two countries that improved relations during 1999 "earthquake diplomacy" efforts after earthquakes hit both countries. They continue to disagree over issues such as the role of the Ecumenical Patriarch within both nations.

ANSWER: **Greece** and the Republic of **Turkey** [need both in any order; or **Hellenic Republic** for Greece]

[10] Greece and Turkey have frequently disputed control over this island in the Eastern Mediterranean. While an independent country, it was invaded by Turkey in 1974, and Turkey is the only country to recognize an "independent republic" in its north.

ANSWER: Republic of **Cyprus**

[10] This 1923 treaty resulted in a large population exchange between Greece and Turkey. Signed in its namesake Swiss city, it formally ended the war between the Ottomans and the Allies during World War I and came after the failed Treaty of Sevres.

ANSWER: Treaty of **Lausanne** <Cheyne>