1. This artist painted a portrait of a publisher's family in which a peacock-decorated wall lies behind a long-haired boy in a dress sitting on a dog who looks up at his sister. This artist of *Madame Charpentier and her Children* painted three of his friends, including Georges Riviere, at a table chatting with some girls leaning over a bench in a painting of couples dancing. In another of his paintings, his future wife Alice Charigot plays with a dog at a table with several wine bottles while Gustave Caillebotte stands around in a white shirt and boatman's hat. For 10 points, name this French impressionist who painted *Bal du Moulin de la Galette* and *Luncheon of the Boating Party*.
ANSWER: Pierre-Auguste **Renoir**

080-13-83-12101

2. At night during the spring and summer, a low-level example of these systems develops over the Plains states. Severe weather can be caused by the upward motion of air at the right entrance and left exit region of theses systems. Namesake "streaks" can be found within these systems. Meanders in these systems result in the formation of troughs and ridges and are a result of Rossby waves. These systems are typically found near the tropopause and at the boundary of Hadley and Ferrell or Ferrell and polar cells. Although not fronts, these systems are classified into polar and subtropical. For 10 points, identify these narrow bands of fast-moving air in the upper atmosphere.
ANSWER: **jet** streams [prompt on jet **streak**s until it is read]

066-13-83-12102

3. This man sent Thurbrand the Hold to kill Uhtred, the earl of Northumbria, after conquering his territory. In 1027, this man left his domain to witness the crowning of Conrad II as Holy Roman Emperor. This grandson of the Polish Mieszko I conquered most of Wessex in 1015. He made peace with Edmund Ironside to gain control of England, after this son of Sweyn Forkbeard invaded it during the rule of Edmund's father, Aethelred the Unready. England had prosperity during his reign due to his ability to ward off Vikings. For 10 points, name this king of England from 1016 to 1035 who also ruled from 1019 as king of Denmark.
ANSWER: **Canute** the Great [or **Knud** den Store; or **Knut** den Mektige]

192-13-83-12103

4. This language's prohibitions or negative commands can put the word "na" before an optative or "ma" before an aorist verb. This language allows for absolute clauses in the locative case, and its infinitive behaves like a Latin accusative supine. An early grammar by Panini outlined thousands of rules for this language, including vowel changes that arise from compounding words called sandhi. Its discovery by British scholars led to the theory that it, Greek, and Latin have the same ancestor language. For 10 points, name this language first written with Brahmanic script in classical India.
ANSWER: **Sanskrit** language [or **samskrta**]

104-13-83-12104

5. One article of this law handed out lands to veterans at rates including 5,000 acres for a field officer and 50 acres to a private. This law organized the territories of Grenada and East Florida, among others. This law was modified within five years by the treaties of Hard Labor and Lochaber. The first article of this law defined the boundaries of the new government of Quebec, which had just been acquired from the French. For 10 points, name this law which most notably irked colonists by setting a westward limit on expansion into Indian territories and banning private purchase of land from Indians.
ANSWER: Royal **Proclamation of 1763**

6. In this novel, one character awards a five-dollar prize to a boy's disturbing essay on the topic "My Ambition: How I Can Better the Position of the Negro Race in Society." That character is thrown in prison for confronting a sheriff over the treatment of his son, whose gangrenous feet had to be sawed off when he was put in a freezing room for three days. Another character distinguishes her "inside room" from her "outside room" and makes plans to kill Hitler with her love interest, Harry Minowitz. This novel's ending showcases the different reactions of Mick Kelly, Dr. Copeland, and Biff Brannon to the death of a friend who shoots himself after the death of Spiros Antonapoulos. For 10 points, name this novel about the deaf-mute John Singer written by Carson McCullers.
ANSWER: *The **Heart is a Lonely Hunter***

7. Modern performers of one of this man's sonatas play really high to compensate for the lack of the extra strings on the title extinct instrument. This composer predominantly used wind instruments to score a liturgical work based on poems by Johann Philipp Neumann. This composer of the *Arpeggione Sonata* and the *German Mass* gave his ninth symphony a majestic nickname to distinguish it from his sixth in the same key. This composer's rendition of "Ellen's Third Song" is often published as *Ave Maria*. He may have taken the B-minor entr'acte for his incidental music to *Rosamunde* from the finale of a work with two complete movements. For 10 points, name this German composer of the *Unfinished Symphony*.
ANSWER: Franz Peter **Schubert**

8. In a novel set in this country, a small town is destroyed by followers of a sideshow freak called "the Prince." This country is home to the author of *The Melancholy of Resistance* and *Satantango.* The protagonist of another novel from this country is told, "You're not a Jew, you're a Gentile kid," by his fellow prisoners at Zeitz, and he concludes the novel by thinking that next time he is asked, he will talk about "the happiness of the concentration camps." That novel is *Fatelessness.* An author from this country who moved to England wrote a novel whose protagonist confesses to plotting against Number One after being tortured by Gletkin. For 10 points, name this country home to Imre Kertész and Arthur Koestler.
ANSWER: **Hungary**

9. The Kok cycle uses intermediate S states to explain the period-four damped oscillation in this reaction. The color change of DCIP, from blue to colorless, is commonly used to demonstrate this reaction. The protein complex in which this reaction occurs has four manganese atoms and a calcium ion. It is driven by the extremely strong oxidizing ability of P680+. This reaction, sometimes named for Robert Hill, occurs in the absence of carbon dioxide. It results in the production of four electrons used to replace those lost by photosystem II chlorophyll molecules. For 10 points, name this reaction which occurs in the light-dependent reactions of photosynthesis in which water is split to produce a diatomic gas.
ANSWER: **oxygen evolution** [or **photolysis** of water; or **oxidation of water**; or light-catalyzed **hydrolysis**; or equivalents mentioning water being broken down to form oxygen; prompt on "light-dependent reactions" or "LDR"; prompt on "photosynthesis"]

10. This warrior gave an unheeded warning to Amphinomus shortly after winning a boxing match against Irus. This hero was friends with a family slave who had been the son of king Ktesios until a nurse handed him to a Phoenician pirate. In a play by Sophocles, this man and Neoptolemus go to Lemnos to fetch Philoctetes. In Book 10 of the Iliad, he and Diomedes kill Dolon during a nighttime raid on the Trojans. This man built his immobile bed around the trunk of an olive tree. After shooting an arrow through twelve axeheads with his hard-to-string bow, this companion of Eumaeus massacred his wife's suitors. For 10 points, name this husband of Penelope and hero of a Homeric epic.
ANSWER: **Odysseus** [or **Ulysses**; or **Ulixes**]

121-13-83-12110

11. In one of this writer's stories, the dumping of powder in old man Riddle's coffee is related by Chunk MacGowan, who was given that powder to seduce Rosy by the Blue Light Drug Store clerk Ikey Schoenstein. In another of this writer's stories, a homeless man named Soapy is arrested for loitering, and in a third, a janitor finds a ladder and a palette with green and yellow paint on it on the night of Behrman's death in a hospital. This author of "The Cop and the Anthem" and "The Last Leaf" also wrote a story in which Ebenezer Dorset demands payment to have his son returned and a story in which Jim and Della exchange Christmas gifts. For 10 points, name this American author of "The Ransom of Red Chief" and "The Gift of the Magi."
ANSWER: **O. Henry** [or William Sydney **Porter**]

104-13-83-12111

12. Emulating Margaret Bourke-White, this artist mounted one of the eagle gargoyles of the Chrysler Building to capture a tricky shot of dancer David Parsons. A crescent streak of blood extends from an overturned bicycle in an image this artist took during the Bosnian War. This artist shot a half nude David Cassidy for the cover of Rolling Stone and once photographed her lover Susan Sontag in a bear suit. One of this artist's most famous photographs was taken just hours before one of its subjects was killed by Mark David Chapman. In that photograph, a clothed Yoko Ono is kissed by a curled-up, naked John Lennon. For 10 points, identify this portrait photographer most recently famous for her controversial topless photo of Miley Cyrus.
ANSWER: Annie **Leibovitz**

066-13-83-12112

13. For an RLC series circuit, a constant associated with this phenomenon can be calculated as attenuation divided by the resonant angular frequency. That constant associated with this phenomenon is given by one-half the resistance times the square root of capacitance over inductance. That constant is usually symbolized zeta or xi and is equivalent to one-half the reciprocal of the Q factor. This phenomenon can create a function with a quasi-frequency. When there is only one eigenvalue for the differential equation governing this phenomenon, it occurs critically. It usually results in an exponentially-decaying sinusoidal position-time graph as amplitude decreases. For 10 points, name this phenomenon in which energy is lost during harmonic oscillations.
ANSWER: **damping** [or word forms]

190-13-83-12113

14. This institution was addressed in Julius Bachem's article "We Must Get Out of the Tower!", which argued that his political party needed to stop the idea that it only worked for this group. In the Affair des Fiches, Louis Andre denied promotions to this institution's members. Members of this group kidnapped the young Jewish boy Edgardo Mortara. This institution was originally represented in Germany by the "Center Party." This institution was targeted in a conflict named by Rudolf Virchow, in which its officals were put under state control through bills propagated by Adalbert Falk. For 10 points, name this institution targeted by Otto von Bismarck's Kulturkampf, which resulted in the expulsion of orders like the Jesuits and Franciscans.
ANSWER: Roman **Catholic** Church [prompt on specific orders such as **Jesuits** or **Franciscans** before read]

15. This philosopher described the "tragic delusion" of how, during World War I, destruction in Belgium was attributed to Germany rather than to war itself. This man developed a hierarchy of predicates to avoid a problem that prompted the phrase "arithmetic totters" from Gottlob Frege. This creator of a theory of types also examined substitutions in the phrase "George IV wanted to know if Scott is the author of *Waverley*" in his theory of descriptions from "On Denoting." Considering the set of all sets that are not members of themselves led to this man's paradox. This philosopher argued in 1927 at Battersea Town Hall against the existence of God. For 10 points, name this British philosopher who delivered the lecture "Why I Am Not a Christian."
ANSWER: Bertrand Arthur William **Russell**

16. This poet asked, "How should we like it were stars to burn with a passion for us we could not return?" in his poem "The More Loving One." He depicted "an artificial wilderness and a sky like lead" on an object whose viewer expected to see "marble well-governed cities" and "vines and olive trees." In another poem, he wrote that we are "children afraid of the night who have never been happy or good," noting, "Those to whom evil is done do evil in return." This poet wrote of how "the torturer's horse scratches its innocent behind on a tree" in a poem opening, "About suffering they were never wrong, the old Masters." For 10 points, name this British poet of "The Shield of Achilles," "September 1, 1939," and "Musee des Beaux Arts."
ANSWER: W. H. **Auden**

17. Earlier on the day of one of these events, one of its participants was found napping, lights on, covered with notecards. During one of these events, a participant called the Chinese islands of Quemoy and Matsu "two little pieces of real estate." One participant in these events was helped out by his Addison's disease. The other participant in these events bashed his knee on a car door in North Carolina, which became a severe infection, resulting in him losing 20 pounds and appearing haggard, compared to the movie-star like appearance of his opponent. For 10 points, name these first televised events of their kind, which played a huge role in the victory of a certain Catholic in the 1960 presidential election.
ANSWER: **Nixon-Kennedy** debates [accept **1960 presidential debates** before "1960"]

18. For a given threshold eta, the likelihood-ratio method uniformly has the highest value of *this* according to the Neyman-Pearson lemma. A decrease in this quantity is the main cost of using a non-parametric procedure over a parametric one. This value depends on the effect size, the sample size, and the significance criterion used. This value is equal to one minus beta, or alternately, it is the probability of not committing a type two error. For 10 points, name this measure of the effectiveness of a statistical test, which is the probability that it will reject the null hypothesis when the null hypothesis is false.

ANSWER: statistical **power**

19. One author from this country created his pen-name by combining the names of Bakunin and Kropotkin and is best-known for his novel, *Family*. This country's "roots-seeking school" is exemplified by a novel in which the Iron Society fights at the Battle of Black Water River, and in which Grandma runs a distillery where urine is used to ferment the title wine. Another author from this country wrote a novel featuring the characters "I," "You," and "She" about a journey to find the title peak. This country is the setting for the novels *Red Sorghum* and *Soul Mountain*. For 10 points, name this country, the birthplace of Mo Yan and Gao Xingjian.

ANSWER: People's Republic of **China**

20. Some proofs of this statement rely on the same contradiction inherent in the barber paradox. The first proof of this statement adapted Cantor's diagonalization proof. Chaitin's omega constant gives a probability for this statement. If this statement were true, then every recursively enumerable language would be recursive. This statement can be used to prove, by reduction, Rice's theorem. This statement is required to be true for busy beavers. Because this statement is usually cumbersome to work with, it is typically reduced to Post's correspondence problem instead. For 10 points, name this undecidable decision problem that asks if a given program will finish running.

ANSWER: **halting** problem [or **halting** theorem; or obvious equivalents, such as whether a program will **halt** or not before "will finish running" is read]

21. Adamantios Korais proposed that this man be made the president of Greece. In 1792, this man defected to Austria to avoid being tried for treason. This man lost popularity after his guards killed or wounded fifty demonstrators on the Champ de Mars. On July 11, 1789, this man presented a draft of the "Declaration of the Rights of Man and the Citizen" to the Assembly. This man commanded the National Guard during the overthrow of Charles X. Earlier in that role, this man's troops saved Louis XVI and Marie-Antoinette from a mob that invaded Versailles. For 10 points, name this French aristocrat who also fought in the American Revolution.

ANSWER: Marie-Joseph-Paul-Yves-Roch-Gilbert du Motier, Marquis de **Lafayette**

22. The garagistes are a group of people utilizing new techniques in the creation of this product, which is imitated by products under the Meritage brand. The Saint-Emilion Classification for this product is released every ten years. In 1976, Steven Spurrier organized the Judgment of Paris, which declared a California counterpart to this product superior to it. The region of Medoc grows particularly fine examples of this commodity, which is primarily grown in the Gironde department around the Garonne River. Sauternes and clarets are white and red variants of it. For 10 points, name this type of alcoholic beverage grown in a Western European nation.

ANSWER: **Bordeaux wine** [or **French wine**; prompt on **wine**]

23. In the Book of Genesis, Tamar uses this substance prior to tearing her ornamented robe. When Jonah finally warns the citizens of Nineveh of their fate, the king of the city dons a sackcloth and sits amidst this substance. Another form of this substance, vibhuti, is mixed with water and applied by devotees to Lord Shiva. On a movable feast day that marks the beginning of Jesus's forty days spent in the desert, this substance is applied to one's forehead, sometimes after the palm fronds from the preceding Sunday are burned to produce this thing. For 10 points, name this substance that names the "Wednesday" of the first day of Lent.
ANSWER: **ash**es

1. Name these philosophical concepts used by Sartre, for 10 points each.
[10] Sartre imagined waiting at a cafe for an appointment with Pierre to illustrate this concept, the absence of things, which he paired with "being."
ANSWER: **nothing**ness [or le **neant**]
[10] Also in *Being and Nothingness*, Sartre coined this term to describe defining one's identity solely in terms of a social role or occupation.
ANSWER: **bad faith** [or **mauvaise foi**]
[10] Sartre also built on Locke's tabula rasa to come up with this statement, which is that humans are born blank slates and shape themselves via their choices and experiences.
ANSWER: **existence precedes essence** [or l'**existence precede** l'**essence**; be lenient with alternate answers, like **existence before essence**]

020-13-83-12201

2. In this play, a rake named Dorimant dumps his mistress Loveit to continue seeing Belinda, whom he also dumps to marry Harriet. For 10 points each:
[10] Name this Restoration comedy by George Etherege, whose title character is the ridiculous Sir Fopling Flutter.
ANSWER: The **Man of Mode**
[10] This author of the Restoration comedy *The Rover* was the first woman to write plays professionally. She described a "royal slave" in *Oroonoko*.
ANSWER: Aphra **Behn**
[10] This Restoration author went into comedy with *Marriage a la Mode* and also wrote satirical poems like "Mac Flecknoe" and *Absalom and Achitophel.*
ANSWER: John **Dryden**

080-13-83-12202

3. Answer the following about memory research, for 10 points each.
[10] Recent research has questioned whether these exceptionally detailed memories of important events, such as seeing 9/11, are actually any different from other memories.
ANSWER: **flashbulb** memories
[10] This process occurs when a person speaks made-up information about their memories without any intention to lie or consciousness of what they're doing. Amnesiacs with Korsakoff's syndrome often do this.
ANSWER: **confabulation** [or **confabulat**ing]
[10] A story about a 5-year-old child in this situation was used in a study by Elizabeth Loftus to show that priming and suggestion often lead people to report false memories.
ANSWER: the child was **lost** in the **mall** [accept any answer involving a child being separated from his/her family and/or unaware of his/her location within a shopping center]

104-13-83-12203

4. One term in this equation equals the product of gravitational acceleration and specific impulse. For 10 points each:
[10] Name this equation which sets the change in velocity equal to the exhaust velocity times the natural log of the ratio of masses. It's sometimes named for Tsiolkovsky.
ANSWER: Tsiolkovsky **rocket** equation [or ideal **rocket** equation]
[10] The Tsiolkovsky rocket equation is derived from this equation of mechanics, which states that the time derivative of momentum equals the net force.
ANSWER: Newton's **second** law of motion [prompt on partial answer]
[10] Allowing mass to be a function of time violates the classical relativity named for this physicist. According to this man's relativity, Newton's laws yield the same results in all inertial reference frames.
ANSWER: **Galileo** Galilei

5. In a children's story written by this author, a girl's wish that it should be "Christmas Every Day" is granted for an entire year. For 10 points each:
[10] Name this author who told the story of a paint magnate in *The Rise of Silas Lapham*.
ANSWER: William Dean **Howells**
[10] *The Rise of Silas Lapham* mocked the rags-to-riches stories of this author, who published *Ragged Dick* and wrote almost exclusively in the genre.
ANSWER: Horatio **Alger**
[10] In this anti-capitalist novel, Howells wrote about Mr. Twelvemough, who hosts a visitor from an island much less selfish than the United States.
ANSWER: *A **Traveler from Altruria***

6. Pirate William Dampier was one of the first Europeans to see this Australian animal, which is scientifically known as *C. atratus*. For 10 points each:
[10] Name this animal that, while not a raven, was the subject of an argument in *The Logic of Scientific Discovery* about the problems in "inferring universal statements from singular ones."
ANSWER: **black swan**s
[10] In his diaries about exploring South America, this man praised William Dampier's observations about the differences between crocodiles and caymans. This naturalist wrote *Kosmos* and has a current off South America named for him.
ANSWER: Alexander von **Humboldt**
[10] While visiting these islands, William Dampier ate some native tortoises, which isn't surprising as he was one of the first people to use the word barbecue in a written English sentence. Charles Darwin later visited these islands and studied some of their finches.
ANSWER: **Galapagos** Islands

7. The biographer of this piece's composer likened it to "Zeus hurling thunderbolts at the world." For 10 points each:
[10] Name this 1831 solo piano work written during the Russian attack on Warsaw during the November Uprising.
ANSWER: *Revolutionary Etude* [or **Etude No. 12**, Op. 10]
[10] The *Revolutionary Etude* is part of the Opus 10 of this prolific Polish pianist of many nocturnes, mazurkas, waltzes, and polonaises.
ANSWER: Frederic Francois **Chopin**
[10] Give the opus number of Chopin's other etude collection, dedicated to Marie d'Agoult, which includes pieces nicknamed "Ocean," "Butterfly," and "Wrong Note."
ANSWER: *Etudes Op.* **25**

8. The RINGO/Speedy family activates these proteins, whose consensus sequence is S slash TPXK slash R. For 10 points each:
[10] Name these evolutionarily conserved enzymes that regulate the cell cycle by binding to a namesake small protein.
ANSWER: **cyclin-dependent kinase**s [or **cdk**s; do not accept or prompt on "cyclin"]
[10] CDK-1 operates during this process, a form of cell division which produces two diploid cells from one.
ANSWER: **mitosis**
[10] Hopefully, CDK inhibitors cause less collateral damage against cancer cells than this class of steroid hormones, including dexamethasone, that upregulate anti-inflammatory proteins.
ANSWER: **glucocorticoid**s [or **GC**s]

9. This event was covered by the first female war correspondent, Sarah Wilson. For 10 points each:
[10] Name this 217-day siege in which Robert Baden-Powell withstood attacks by Piet Cronje's forces until he was relieved on May 17, 1900. It was considered a turning point in the war of which it was a part.
ANSWER: Siege of **Mafeking**
[10] The Siege of Mafeking was part of a namesake conflict between the British and these Afrikaans-speaking Dutch settlers who lived in the Transvaal Republic and Orange Free State.
ANSWER: **Boer**s [or Second Anglo-**Boer** War]
[10] This top hat sporting president of the South African Republic got mad at the aborted Jameson Raid against his country. He led Transvaal during the Anglo-Boer War and is the namesake of a gold coin.
ANSWER: Paul **Kruger** [or Stephanus Johannes Paulus **Kruger**]

10. In a recruiting poster, this man points at the audience and asks "Who's Absent? Is it You?" For 10 points each:
[10] Name this stout man who dresses like a country squire. He is the British equivalent of Uncle Sam and represents England in many political cartoons.
ANSWER: **John Bull**
[10] In one political cartoon, John Bull walks off with Marianne, a young woman representing this country. She made her first major appearance on medals celebrating the storming of the Bastille.
ANSWER: **France** [**French Republic**; or **Republique Francaise**]
[10] John Bull frequently featured in the cartoons of James Gillray. Gillray depicted this man dining with a Frenchman in "The Plum Pudding in Danger," in which two men divide up the world.
ANSWER: William **Pitt, the Younger** [prompt on **Pitt**]

11. The most prominent member of this group was Mississippi's James Alcorn. For 10 points each:
[10] Name this pejorative term used to describe Southern whites who supported Reconstruction after the Civil War. As opposed to carpetbaggers, these were native Southerners.
ANSWER: **scalawag**s
[10] Another major scalawag was former Confederate General James Longstreet, who notably disagreed with Robert E. Lee over ordering Pickett's Charge at this three-day Civil War battle.
ANSWER: Battle of **Gettysburg**
[10] This author has written multiple books on Reconstruction, including the award-winning 1988 book *Reconstruction: America's Unfinished Revolution*. This Columbia professor won the 2011 Pulitzer for History for his 2010 work *The Fiery Trial*.
ANSWER: Eric **Foner**

12. Answer the following about gold mining in the U.S., for 10 points each.
[10] The original "Mother Lode" was located in the northern region of this state's Mariposa County. This state's capital was founded after gold was found near Sutter's Mill.
ANSWER: **California**
[10] Today, 78% of gold mining in the US occurs in this state, whose Goldstrike Mine is the largest in North America. Two-thirds of this state's inhabitants live in Clark County.
ANSWER: **Nevada**
[10] The first gold rush in the US occurred in this Northern Georgia city, where M.F. Stephenson allegedly claimed, "There's gold in them thar hills."
ANSWER: **Dahlonega**

13. For 10 points each, answer the following about Old English poetry.
[10] These exocentric compound words are poetic devices that figuratively describe an underlying noun. In *Beowulf*, examples include "whale-road" and "ring-giver."
ANSWER: **kenning**s
[10] This technique was used rather than rhyme in Old English poems such as *Beowulf*, which employs it to link the two half-lines of a given poetic line.
ANSWER: **alliteration** [or **alliterative** verse]
[10] This poem, found in the Exeter Book, is mostly narrated by a figure who laments his life on the "paths of exile." It notes that "fate is inexorable" in its opening lines, a brief prologue in the author's voice.
ANSWER: "The **Wanderer**"

14. This goddess finally discovered her husband trapped in a chest after she traveled to Byblos. For 10 points each:
[10] Name this Egyptian goddess who reassembled her husband Osiris after he was cut to pieces by Set.
ANSWER: **Isis** [or **Aset**]
[10] Isis, Hathor, and pretty much every other Egyptian goddess sometimes function as this counterpart to the sun god Ra. In that role, they are known as this body part "of Ra."
ANSWER: the **eye** of Ra
[10] This other goddess who is sometimes the eye of Ra was considered the protector of Lower Egypt. She was depicted in the *uraeus* on the Pharaoh's crown.
ANSWER: **Wadjet**

15. Writers in this language included the Romantic poet Adam Oehlenschläger. For 10 points each:
[10] Identify this language in which Hans Christian Andersen wrote his fairy tales.
ANSWER: **Danish** [or **Dansk**]
[10] Danish writer Isak Dinesen included "The Supper at Elsinore" and "The Monkey" in this set of creepy short stories.
ANSWER: *Seven Gothic Tales*
[10] In Andersen's story "The Little Match Girl," after the title character's last match burns out, this figure takes her to heaven after being shown to be more beautiful and tall than ever.
ANSWER: the Little Match Girl's **grandmother**

16. In one of this man's books, he records claims that a certain ruler is actually a monster with a vanishing head. For 10 points each:
[10] Name this Byzantine scholar who wrote a notorious *Secret History* about Justinian.
ANSWER: **Procopius** of Caesarea
[10] In his other work, *Buildings of Justinian*, Procopius talks about such Byzantine buildings as this church, later turned into a mosque, and now an Istanbul museum. Justinian reportedly said "Solomon, I have outdone thee!" after it was finished.
ANSWER: **Hagia Sophia** [or **Sancta Sophia**; or **Ayasofya**; or Church of the **Divine Wisdom**; or Church of the **Holy Wisdom**]
[10] This Bishop of Caesarea wrote a less salacious *Ecclesiastical History*, the first major Christian history. He wrote an unfinished yet highly flattering *Life of Constantine*.
ANSWER: **Eusebius** of Caesarea [or **Eusebius** Pamphili]

17. Alfred Werner pioneered the chemistry of these substances, for 10 points each.
[10] Name these compounds consisting of an anionic or neutral ligand compound attached to a central metal atom.
ANSWER: **coordination** compounds [or **coordination complex**es; or **metal complex**es]
[10] Because d orbital electrons in the metals of coordination complexes are often excited to a higher energy state, the compounds display a wide variety of this property. This property changes for an indicator in its pH range.
ANSWER: **color**
[10] These diagrams, named for two Japanese chemists, are used to calculate the visible, IR, and UV spectra of coordination complexes.
ANSWER: **Tanabe-Sugano** diagrams

18. On October 14, 2012, this Austrian became the first human to break the sound barrier without a vehicle. For 10 points each:
[10] Name this skydiver whose drop from a helium balloon down to earth 24 miles below set the record for the highest successful parachute jump.
ANSWER: Felix **Baumgartner**
[10] Baumgartner's jump took place through this energy drink company's Stratos project. This company also hosts "Flugtag" and Crashed Ice competitions.
ANSWER: **Red Bull**
[10] In 2007, Baumgartner became the first person to BASE jump off of this building, which is named for its number of floors.
ANSWER: **Taipei 101**

19. When given an input of e to the a t, this operation yields one over s minus a. For 10 points each:
[10] Name this transformation that converts functions from the time domain to s-domain. It involves integrating the product of a function times e to the negative s times t, from zero to infinity.
ANSWER: **Laplace** transform
[10] The Laplace transform applied to this function, when it hasn't been shifted, is equal to one.
ANSWER: Dirac **delta** function
[10] Laplace transforms are commonly used to solve these equations, which may also be solved using separation of variables or with integrating factors. They can be ordinary or partial.
ANSWER: **differential** equations

20. In one painting by this artist, two men whisper near a Biblical woman, who turns away in disgust. For 10 points each:
[10] Name this painter of a version of *Susanna and the Elders* who also painted a woman from Bethulia enlisting the aid of her maidservant in *Judith Beheading Holofernes*.
ANSWER: Artemisia **Gentileschi**
[10] Gentileschi's depiction of Judith beheading Holofernes was influenced by a version from this master of chiaroscuro and tenebrism, whose own works include a series on Saint Matthew and *The Supper at Emmaus*.
ANSWER: **Caravaggio** [or Michelangelo **Merisi**]
[10] This artist, Artemisia's father, originally received credit for *Susanna and the Elders*. He painted frescoes for a destroyed casino in Genoa before moving to Paris and then London.
ANSWER: **O**razio Lomi Gentileschi [or **Orazio** Gentileschi; prompt on **Gentileschi**]

21. In the aftermath of this battle, Grand Duke Nikolai told an attache from France, "It's an honour to make such a sacrifice for our allies." For 10 points each:
[10] Name this 1914 battle in East Prussia, at which General Samsonov committed suicide after his isolated Russian Second Army was destroyed by the Germans.
ANSWER: Battle of **Tannenberg**
[10] Soon after the Battle of Tannenberg, this German commander won the Battle of the Masurian Lakes. He later became president of the Weimar Republic and served as the namesake of an overly-combustible zeppelin.
ANSWER: Paul von **Hindenburg**
[10] In this 1916 effort, Russians used shock troops to break through the Austrian lines, capturing 25,000 square miles of territory. Romania joined the Allies after hearing of this offensive, but the Germans responded by capturing Bucharest.
ANSWER: **Brusilov** Offensive