1. One novelist from this country divided his masterpiece into three sections, "The Land," "The Man," and "The Fight," in which he applied social Darwinist theories to a historical rebellion in the title region. Another novelist from here began his career with a sequence of six novels about various contingents of his country's poor culminating in *Captains of the Sands.* That author from this country wrote about the romance between the Syrian bar owner Nacib Saad and the title cook in *Gabriela, Clove and Cinnamon.* Another author from here wrote the formally innovative *Posthumous Memoirs of Bras Cubas.* For 10 points, name this country where writers such as Jorge Amado and Machado de Assis wrote in Portuguese.
ANSWER: **Brazil**

2. This document caused a boom for the textile industry in Spitalfields, England. The Duke of Lesdiguieres enforced the laws of this document. Upon hearing of the signature of this document, Clement VIII claimed that "liberty of conscience given to everybody is the worst thing in the world." A special court dealing with disputes from this document was the Chambre de l'Edit. The Peace of Alais was signed to restrict political power from a group of people who received places de surete from this document. A mass exodus was prompted by this document's revocation by Louis XIV signing into law the Edict of Fontainebleau. For 10 points, identify this 16th century document by Henry IV which granted religious freedom to Huguenots.
ANSWER: Edict of **Nantes**

3. Police investigated this man for the 2003 theft of Iraqi war criminal Tariq Aziz's cigar case. NPR claimed this man used a campaign slogan saying if you voted for his party, "your wife will get bigger breasts." A fan of cycling, he lends his name to Barclays Cycle Hire bicycles used in the city he works in. This man won his current position by defeating Ken Livingstone, thanks to high voter turnout in the Bexley and Bromley districts. In November 2013, this politician announced the "Tube" transit system would run twenty-four-hours on weekends. This Conservative politician, who is noted for his unruly hair, served as Mayor during the 2012 Summer Olympic Games. For 10 points, name this Mayor of London.
ANSWER: Alexander Boris de Pfeffel **Johnson**

4. The fact that this object commutes with the translation operator in a periodic system is a key step in the proof of Bloch's theorem. The negative derivative of this quantity with respect to p is equal to the time derivative of p, and the derivative of this quantity with respect to p is equal to the time derivative of q, in one system. The eigenvalues of this operator are assumed to change slowly under a perturbation in the adiabatic theorem. The time derivative of the action plus this quantity is equal to zero according to an equation partly named for Jacobi. In classical mechanics, this value can be obtained by taking the Legendre transform of the Lagrangian. For 10 points, name this mathematical function used to define a namesake type of mechanics, which corresponds to the total energy of a system.
ANSWER: **Hamiltonian**

5. A version of this task that uses a Gaussian process is called kriging. The sum of the coefficients of a construct used to do this task converges to Magata's constant, and that version of this task can be done using Neville's algorithm. The unisolvence theorem states that the unique solution to one version of this task is found by taking the determinant of the Vandermonde matrix. For multivariate data over a regular grid, the nearest-neighbor method of performing this task creates a series of piecewise-constant functions. The use of polynomials to perform this task can lead to oscillatory behavior at the endpoints, which can in turn be avoided by using splines. For 10 points, name this technique which uses some function to create new data points within an interval.
ANSWER: **interpolation**

6. This river led to a namesake bridge war when Governor "Alfalfa Bill" Murray ordered a new free bridge to be opened. Cartographers debate whether its true stem is at the North Fork or at Prairie Dog Town Fork. According to the Adams-Onis Treaty, this river's south bank, not that of the Rio Grande, was set as the boundary between the United States and Spain. A collection of fallen trees was this river's "Great Raft," which prevented navigation between Alexandria and Shreveport. Its namesake "shootout" refers to an annual college football game between the Longhorns and Sooners. For 10 points, name this colorfully named river that is basically the border between Texas and Oklahoma.
ANSWER: **Red** River of the South [do not accept "Red River of the North"]

7. This event is in the title of an Alfred Young book about George Robert Twelves Hewes, a shoemaker. The financier Robert Murray tried to pay for the damage done in this event. Historian George Bancroft helped to spread the urban legend that the signal for it was a phrase about how "nothing more to save the country" can be done. This event inspired a similar incident in Annapolis directed against the *Peggy Stewart*, and it was inflamed by Governor Thomas Hutchinson's hard line stance. It began after people poured out of the Old South Meeting House and dressed like Mohawks, possibly after hearing a signal from Samuel Adams. For 10 points, name this December 1773 event in which members of the Sons of Liberty dressed like Indians and ruined shipments.
ANSWER: **Boston Tea Party**

8. A variant of GFP sensitive to this value is often fused to VAMP to track synaptic vesicle transport. An instrument used to measure this value is governed by the Nikolsky-Eisenman equation, and Glassoe and Long suggested correcting this value by an additive factor of 0.4 in deuterated media. For compounds like TFMS and certain carboranes, this value is often supplanted by a function named for Hammett. Hydrion strips can be used to measure this quantity, though it is more accurately measured using an ion-selective glass electrode. More often, compounds like bromothymol blue and phenolphthalein are used to estimate this value from color changes. For 10 points, name this value which ranges from 0 to 14, which is found by taking the negative log base 10 of the hydrogen concentration of an aqueous solution.
ANSWER: **pH** [or **pOH** until "hydrogen" is read; prompt on "acidity" or "basicity"]

9. This model can be extended to consider trade in the open economy by pairing it with the interest parity relation, leading to the "impossible trinity;" that extension is known as the Mundell-Fleming model. A component of this model is computed by considering price level, income and the liquidity preference function. The impacts of fiscal and monetary policy can be determined by considering shifts in the curves in this model. It was developed by John Hicks based on the ideas presented in *The General Theory of Employment, Interest, and Money.* For 10 points, identify this model in which GDP is plotted against interest rate, whose equilibrium occurs at the intersection of its namesake curves.
ANSWER: **IS/LM** model [or **Investment Saving/Liquidity Preference Money Supply** model]

10. One poster during this election implored the viewer to "Confirm their confidence" in the incumbent and showed a hand marking an X on a ballot. The winning party in this election wrote the manifesto "Let us face the future together". During one televised speech in this election, the losing candidate stated that his opponents would have to use "some form of Gestapo" in order to implement their proposed social reforms, which included full employment and an expanded welfare state suggested by the Beveridge report. This election brought Ernest Bevin to the post of Foreign Secretary and resulted in the creation of the National Health Service. For 10 points, name this election in which the Labour Party under Clement Attlee came to power over Winston Churchill's conservatives.
ANSWER: **1945 General Election** in the UK [accept UK **1945 Parliamentary Election**; accept variations of Clement **Attlee beating** Winston **Churchill** until "Attlee"]

11. One goddess in this myth system was originally a very promiscuous woman who was cut apart by her suitors, and whose body gave birth to a plant. One goddess in this mythology put her baby on the ground to determine its father; the baby crawled toward the moon god, who had impregnated that goddess using sperm hidden in fruit. In this mythology, one ruler's brother was able to destroy hills with his slingshot, and was turned to ice or trapped in a cave because of his cruelty. One ruler of these people was told to build a temple at the site that a golden staff sunk into the earth. Another god in this pantheon kept the Milky Way in a jug and used it to create rain; that god was Ilyap'a. For 10 points, name this mythological system in which the sun god Inti was born of the supreme deity Viracocha, who was in turn the grandfather of the legendary first emperor Manco Capac.
ANSWER: **Inca**n myth

12. In this play, an audience cries out, "Fantastic!" after hearing the story of "something really incredible" that turns out to be a man bending down to tie his shoelace. One character in this play tells his audience an "experimental fable" in which a dog explains that he didn't swallow his trunk because he thought it was an elephant. The opening stage directions to this play note that it is set in a "middle-class English interior" where "an English clock strikes 17 English strokes." Mary says she is Sherlock Holmes in this play after proving that a couple is not actually married. In this play, a visit by the Martins to the Smiths is interrupted by the entrance of the Fire Chief. For 10 points, name this first play by Eugene Ionesco.
ANSWER: The **Bald Soprano** [or La **Cantatrice Chauve**]

13. Gerald Creasy warned of a communist takeover in what is now this country. This country's first leader wore a skull cap with "PG" for "prison graduate" embroidered on it. The National Liberation Movement grew out of Asante farmers anger when this country's ruling power used the Cocoa Marketing Board to keep cocoa prices one-third the market price. Charles Arden-Clarke agreed to cut short this country's first leader's prison sentence after his party won an overwhelming majority in new elections. A group of "men of property and standing" led by Joseph Danquah formed a political party whose slogan was "Self-government in the shortest time possible," and that party was opposed by another whose slogan was "Self-government now." For 10 points, name this country that was once the Gold Coast, whose first president and prime minister was Kwame Nkrumah.
ANSWER: **Ghana** [or **Gold Coast** until mentioned]

14. This character gives a speech which instructs his servant, "be thou void of these affections: compassion, love, vain hope, and heartless fear." This character admits to have committed fornication, to which he adds, "but that was in another country; and besides, the wench is dead," and he earlier claims to "kill sick people groaning under walls." After having another man poison some porridge, this character exclaims "how sweet the bells ring, now that the nuns are dead!" He shouts "tongue, curse thy fill, and die!" as he dies in a cauldron of boiling water intended for Ferneze, who confiscated his property as tribute to the Turks. For 10 points, name this villainous title character of Christopher Marlowe's *The Jew of Malta.*
ANSWER: **Barabas** [or the **Jew of Malta** before it is read]

15. This artist declined a request to paint a woman's eye on a shirt pin. In one of this artist's paintings, a bishop points his cane at a tree-covered building. He created a series of "six-footers" after the success of his canvas *The White Horse.* This painter spent hours reading Luke Howard and sketching clouds during his "skying" sessions, which led to the realism of the dark nimbus over a Neolithic monument in a painting of his. In the most famous artwork of this frequent painter of Salisbury Cathedral, a dog stands on the left bank of the Stour River near Willy Lott's cottage, toward which a cart is being pulled. For 10 points, name this English landscape artist of *The Hay Wain.*
ANSWER: John **Constable**

16. A group of nineteen of these creatures called the Zabaniah are responsible for torment, and a set of them called the "Journeyers" are tasked with seeking out assemblies. A pair of these creatures called the Kiramin Katibin are responsible for recording deeds, and the appearance of one of these creatures twice in a single year prompted the Farewell Sermon. These creatures are made of light, unlike jinns, who are made of smokeless fire. The first appearance of one of these creatures is celebrated on the Night of Power, and during that event he repeatedly said "read!" to a person who replied "I can't read." For 10 points, name these creatures from Islamic mythology, including one which first appeared in a cave to Muhammad and dictated the Qu'ran, named Jibril.
ANSWER: **angel**s

17. John Bassett nearly lost his job for an unflattering article about the intellectual scene of this place. H. L. Mencken complained that this place is "almost as sterile, artistically, intellectually, culturally, as the Sahara desert" in "The Sahara of the Bozart." Mencken was also critical of an article by Donald Davidson which defended its religious and agrarian past. Davidson belonged to a group of writers from this place who argued for its traditionalism in the collection *I'll Take My Stand.* William Faulkner's novels are often classified as a type of "Gothic" fiction named for this place. For 10 points, name this region of the United States.
ANSWER: the American **South** [or obvious equivalents]

18. In a portion of this composition, an offstage clarinet repeats a C and A-flat ostinato. In another of its movements, the pianos play C, D-flat, D, and E scales in the manner of beginning music students. This is the most famous composition in the classical repertoire to include a part for a glass harmonica. The fourth movement of this composition contains a slow rendition of the "Galop infernal" from *Orpheus in the Underworld.* A cello solo is accompanied by two pianos in the only movement from this collection the composer allowed to be played in his lifetime. In this piece's movement "Fossils," the xylophones mimic the composer's own *Danse macabre.* For 10 points, name this musical menagerie composed by Camille Saint-Saens.
ANSWER: The ***Carnival of the Animals*** [or Le ***Carnaval des Animaux***; or "The **Cuckoo in the Depths of** the **Woods**", "Le **Coucou au Fond des Bois**", or "**Aquarium**" until "fourth movement" is read]

19. A complex of cubilin and amnionless absorbs this vitamin. A biologically active form of this vitamin is abbreviated holoTC. This vitamin is a coenzyme for a reaction that accompanies the demethylation of methyltetrahydrofolate. Two important reactions for which it is a coenzyme are the conversion of methylmalonyl-CoA to succinyl-CoA and of homocysteine to methionine. Pancreatic proteases free this vitamin from haptocorrin. Autoimmune disorders that attack parietal cells can cause its deficiency because it must be bound to intrinsic factor in order to be absorbed in the ileum. The activity of this vitamin is due to the cobalt sitting at the center of its corrin ring, and its deficiency can lead to megaloblastic or pernicious anemia. For 10 points, name this B vitamin.
ANSWER: vitamin **B12** [or **cobalamin**]

20. The arrangement of betel leaves used during weddings inspired the layout of this city's Palace of Culture. A National Monument located in this city has garlands laid on it every Warriors' Day and was originally adjacent to Cenotaph Road. A mosque in this city has towers and a main dome resembling closed and open umbrellas and also contains the Heroes Mausoleum. The most famous building in this city includes a cross-section resembling the Rub el Hizb symbol from Islamic art, and contains a skybridge connecting its two halves. That Cesar Pelli-designed building in this city was surpassed by Taipei 101 as the world's tallest building. For 10 points, name this Asian capital city that contains the Petronas Towers.
ANSWER: **Kuala Lumpur** [or **KL**]

21. One poem by this author declares, "Into your virtual city I'll have passed," and is narrated by a figure "in Springtime" who is noted in another poem for "the mild pods of his eyelids, his pointed skin cap." This poet described finding "only the secular powers of the Atlantic thundering" in "North." This poet wrote of a "poppy bruise" on a "left temple" in a poem recalling his mother coughing out "angry tearless sighs." The narrator of one of his poems flees from a "a coarse croaking" he "had not heard before" in a poem in which a boy gathers "jampotfuls" of frogspawn. For 10 points, name this author of "Mid-Term Break" and "Death of a Naturalist," an Irish poet known for translating *Beowulf*.
ANSWER: Seamus **Heaney**

22. Soldiers sympathetic to this group were killed after the Banbury mutiny, after a group of officers named Grandees began to reject their ideas. William Walwyn was one of these people, whose supporters wore rosemary springs and sea-green ribbons. The manifesto *An Agreement of the People*, written in part by John Lilburne, laid out this movement's beliefs. These participants in the Putney debates were the basis for a more extreme splinter group known as the Diggers. For 10 points, name these believers in universal male suffrage and radical social equality, who were put down by Oliver Cromwell after the English Civil War.
ANSWER: **Leveller**s

23. Ahmed Zewail observed these structures using lasers in a new field of study he dubbed femtochemistry. Oseltamivir, or Tamiflu, is an example of an inhibitor that works by mimicking this kind of structure. The Eyring equation was developed out of the theory of this name. This structure has a trigonal bipyramidal geometry in the SN2 reaction. This structure's appearance depends on the species closest to it in free energy, according to Hammond's postulate. Activated complexes are similar to these structures, which are denoted by a double dagger symbol. This structure corresponds to the highest potential energy along the reaction coordinate. For 10 points, name these fleeting structures produced during chemical reactions.
ANSWER: **transition state**s [accept **activated complex**es before mentioned]

1. Benjamin Harrison unsuccessfully suggested this man be named the country's poet laureate. For 10 points each:
[10] Name this "Hoosier" poet, who penned such sentimental fare as "The Raggedy Man" and "Little Orphan Annie."
ANSWER: James Whitcomb **Riley**
[10] James Riley reportedly discovered this African-American poet in 1892. This man wrote the poem "We Wear the Mask" and a line from his poem "Sympathy" inspired the title of Maya Angelou's autobiography *I Know Why the Caged Bird Sings.*
ANSWER: Paul Laurence **Dunbar**
[10] Another Indiana author was former Civil War General Lew Wallace, who is best known for writing this book, whose title Jewish prince meets Jesus, is sent to a Roman galley, and defeats his nemesis in a chariot race.
ANSWER: ***Ben-Hur**: A Tale of the Christ*

2. This man disowned his satire of anti-Chinese racism "Plain Language from Truthful James" when it became popular with actual racists. For 10 points each:
[10] Name this author, who wrote from the point of view of a bullet anxious why a man does not "answer to my kiss" in "What the Bullet Sang."
ANSWER: Bret **Harte**
[10] Harte wrote this short story about the selfless behavior of people like John Oakhurst and "the Duchess" who are exiled by a secret committee for immoral behavior.
ANSWER: "The **Outcasts of Poker Flats**"
[10] Ah Sin and the narrator take part in this activity in "Plain Language from Truthful James." John Oakhurst is disliked by many in Poker Flats for his proficiency at doing this.
ANSWER: playing **card**s

3. Answer the following about the history of skulls in painting, for 10 points each.
[10] This painting by Hans Holbein the Younger depicts a diagonally-distorted skull at the feet of the two title professionals.
ANSWER: *The **Ambassadors*** [or *The French **Ambassadors***]
[10] This subgenre of Dutch still-life paintings often depicted skulls on tables as a symbol of the emptiness of life.
ANSWER: **vanitas** paintings
[10] This artist and member of Les Vingt depicted two skulls playing tug-of-war over a pickled herring with their teeth in one of his skeleton paintings. He also created a large crowd scene in which Jesus visits his nation's capital, in which a large red banner reads "VIVE LE SOCIALE."
ANSWER: James **Ensor**

4. Processes of this type generate no entropy, meaning that throughout each step of this kind of process, the system is at thermal equilibrium. For 10 points each:
[10] Name these types of thermodynamical processes that have a line integral around one cycle of dQ over T equal to zero, according to Clausius's theorem.
ANSWER: **reversible**
[10] Clausius's theorem is a restatement of this important result, which says that entropy cannot decrease in a closed system.
ANSWER: **second law of thermodynamics**
[10] Callen and Welton proved this important result in non-equilibrium thermodynamics, which states that the random reversible deviations from equilibrium result in irreversible heat production.
ANSWER: **fluctuation-dissipation** theorem [or **FDT**; do NOT accept "fluctuation theorem"]

5. The name of this edict was taken from a spell in the ring cycle, and it was expanded by Wilhelm Keitel to include anyone who survived for eight days in custody. For 10 points each:
[10] Name this decree which allowed prisoners and dissidents in Nazi-occupied territories to be skirted away to a prison or concentration camp without anyone knowing.
ANSWER: **Nacht Und Nebel** [or **Night and Fog** decree]
[10] Part of the job of this Nazi propaganda minister was to suppress information about the Nazis use of concentration camps and prisons.
ANSWER: Joseph **Goebbels**
[10] Virginia d'Albert-Lake, an American resistance fighter and victim of the Night and Fog Degree, was taken to this all-female prison camp 50 miles north of Berlin. Corrie ten Boom described her experiences here in *The Hiding Place*.
ANSWER: **Ravensbruck**

6. This publication has such columns as "Lexington" to refer to news about the United States. For 10 points each:
[10] Name this publication which is published from London. Noted for its support of classical liberalism, it is noted for its Big Mac Index tracing the price of hamburgers in various countries.
ANSWER: *The **Economist***
[10] This collaborator with Engels on *The Communist Manifesto* called *The Economist* "the European organ of the aristocracy of finance."
ANSWER: Karl **Marx**
[10] This editor of *The Economist* during almost all of the 1860's wrote such books as *The English Constitution* and *Physics and Politics*. His namesake dictum states that during a credit crunch, lenders should lend freely at a high rate of interest.
ANSWER: Walter **Bagehot**

7. This assembly was the site of Patrick Henry's speech, "If this be treason, make the most of it".
For 10 points each:
[10] Name this colonial legislative assembly in Virginia, the first of its kind in America.
ANSWER: **House of Burgesses** [prompt on partial answer]
[10] Patrick Henry and Dabney Carr convinced the House of Burgesses to establish one of these
committees in the prelude to the Revolutionary War. These governments eventually replaced
colonial legislatures and coordinated action against England.
ANSWER: committees of **correspondence**
[10] Henry first came to political prominence arguing this 1763 case, which originated from
George III's veto of a Virginia law that kept the price of tobacco paid to Anglican clergy at two
pennies.
ANSWER: **Parson**'s Cause

8. This city is located where the Schuykill [SKOO-kull] River meets the Delaware River. For 10
points each:
[10] Name this city which connects to New Jersey via the Walt Whitman, Betsy Ross, and
Benjamin Franklin bridges. The Liberty Bell is no longer located in this city's Independence
Hall.
ANSWER: **Philadelphia**, Pennsylvania
[10] This newspaper of Philadelphia, the third-oldest daily newspaper in America, beat out rivals
by obtaining exclusive publication rights of several Dickens novels. It also first published Poe's
The Raven.
ANSWER: The Philadelphia **Inquirer**
[10] This theater, founded in 1809, is the oldest continuously functioning theater in America. Its
first production, Sheridan's *The Rivals*, was attended by President Jefferson and the Marquis de
Lafayette, and in 1976, this theater hosted the first Ford-Carter debate.
ANSWER: **Walnut Street** Theater

9. This king dies despite clothing Jehoshaphat in his robes. For 10 points each:
[10] Name this king who is condemned for his murder of Naboth in order to steal a vineyard.
ANSWER: **Ahab**
[10] Both Ahab and his wife, Jezebel, frequently clashed with this Biblical prophet, the mentor
of Elisha. This man defeated the prophets of Baal in a dramatic contest on Mount Carmel.
ANSWER: **Elijah**
[10] Elijah ascends into heaven using this type of supernatural vehicle, as described in 2 Kings
2:11. This vehicle is also mentioned in the hymn "Jerusalem."
ANSWER: **chariot of fire** [prompt on partial answer]

10. This time period is the focus of the book *And Their Children After Them.* For 10 points each:
[10] Name this time period that is also the focus of much of Walker Evans' photographs, as collected in the book *Let Us Now Praise Famous Men*. Roy Stryker chaired an agency that took photos during this time period.
ANSWER: **Great Depression** [or **Dust Bowl**; prompt on **1930s**]
[10] This woman took a famous photograph during the Depression called *Migrant Mother*.
ANSWER: Dorothea **Lange**
[10] This other Depression era photographer is best known for his photo entitled *American Gothic, Washington, D.C.,* which shows a black cleaning woman holding a broom and mop in front of the American flag. He also directed the seminal blaxploitation film *Shaft*.
ANSWER: Gordon **Parks**

11. Answer these questions about the ways in which Vikings governed their territory after settling down from raiding, for 10 points each.
[10] This Icelandic deliberative body, the world's oldest still-extant parliament, was established by Norse settlers in the 900s CE to resolve disputes.
ANSWER: the **Althing**
[10] This region of Britain was cordoned off and ruled by Viking decrees. It was established after Guthrum made the treaty of Wedmore with Alfred the Great.
ANSWER: the **Danelaw** [or **Danelage**n]
[10] These payments, a key part of pre-modern Germanic justice systems, were given to the family of a victim by a murderer as compensation.
ANSWER: **weirgild** [prompt on "**blood money**"]

12. This opera, inspired by a comic strip written by Rudolf Tesnohlidek, ends with a gamekeeper dropping his gun after catching a frog instead of the title character, a reverse of what happens in the opening scene. For 10 points each:
[10] Name this racy fairy tale opera, whose lusty title character escapes from being tied up to a dog and is eventually shot by the poacher Harasta.
ANSWER: The **Cunning Little Vixen** [or **Prihody Lisky Bystrousky**; or **Adventures of Vixen Sharp-Ears**]
[10] *The Cunning Little Vixen* is much lighter than this Czech composer's portrait of jealousy and infanticide, *Jenufa.*
ANSWER: Leos **Janacek** [or Leo Eugen **Janacek**]
[10] The House of Commons is lampooned in this duo's fairy tale opera *Iolanthe,* in which the Fairy Queen gives Strephon the ability to pass any bill he proposes as MP. They also produced *HMS Pinafore.*
ANSWER: William Schwenk **Gilbert** and Arthur **Sullivan**

13. Victor Emmanuel Leclerc, brother-in-law to Napoleon, was sent to tame this colony, but died of yellow fever. For 10 points each:
[10] Name this French colony on Hispaniola, the predecessor of a country founded by Jean-Jacques Dessalines and Toussaint L'Ouverture.
ANSWER: **Saint Domingue** (SAN dohm-ONG)
[10] Jean-Jacques Dessalines became Jacques I of this country after leading the only slave revolt which led to the successful creation of a country.
ANSWER: Republic of **Haiti**
[10] Dessalines declared the independence of Saint Domingue after winning the Battle of Vertieres against this general. This man's father commanded the French army at Yorktown.
ANSWER: Jean-Baptiste Donatien de Vimeur, comte de **Rochambeau**

14. This quantity is a measure of stiffness. For 10 points each:
[10] What ratio of stress to strain along an axis holds for elastic deformations?
ANSWER: **Young's modulus** [or **tensile modulus**; or **elastic modulus**; or big **E**]
[10] This ratio measures the lengthening effect that occurs along the axis transverse to the applied load on a material. It's the negative ratio of transverse to axial strain.
ANSWER: **Poisson**'s ratio [or **nu**]
[10] The stress applied tangentially to the face of material is known by this term and usually denoted by the Greek letter tau.
ANSWER: **shear** stress

15. This organelle contains some double-headed phospholipids in its membrane, and antibodies to this organelle are found in people with primary biliary cirrhosis. For 10 points each:
[10] Name this organelle, whose inner membrane contains the four complexes of the electron transport chain and ATP synthase.
ANSWER: **mitochondria** [or **mitochondrion**]
[10] This part of the mitochondrion is where the citric acid cycle takes place.
ANSWER: mitochondrial **matrix**
[10] People with mitochondrial disorders often have this condition, in which more than one different mitochondrial genome is present in the same cell.
ANSWER: mitochondrial **heteroplasmy**

16. Gregory Vlastos's 1954 paper on this argument is considered definitive. For 10 points each:
[10] Name this argument outlined in the *Parmenides,* which states that if the namesake organism has a particular form of that organism, then another form would be required to explain that relationship, ad infinitum.
ANSWER: **third man** argument [or **TMA**]
[10] The third man argument throws a wrench into the theory of forms of this philosopher, who also outlined the Euthyphro dilemma in another one of his namesake dialogues.
ANSWER: **Plato**
[10] Parmenides is accompanied by this student of his in the dialogue. The dialogue begins with this person reading from one of his books in front of a crowd. He asked how many grains of millet must be dropped to make a sound.
ANSWER: **Zeno** of Elea

17. Answer these questions about Samuel Beckett's *Waiting for Godot,* for 10 points each.
[10] This member of the cast is led on a leash by Pozzo. He stays silent except for a single, long nonsense monologue delivered while his bowler hat is on.
ANSWER: **Lucky**
[10] Though Godot never comes, this object suddenly appears close to the end of both acts, right after the Boy exits in each instance. In Oscar Wilde's *Salome,* two guards watch this object become "red as blood."
ANSWER: the **moon**
[10] In both acts, Godot's Boy messenger inexplicably addresses Vladimir by this name.
ANSWER: Mister **Albert**

18. Name these inventors from Greek myth, for 10 points each.
[10] The young Hermes appeased his brother Apollo by killing a turtle and turning it into this stringed instrument.
ANSWER: the **lyre**
[10] Daedalus murdered this nephew of his in jealousy over his invention of the saw.
ANSWER: **Perdix** [or **Talos**]
[10] This prince, who led the Nauplians in the Trojan War, is credited with inventing letters and dice. Odysseus framed him for taking a bribe from Priam.
ANSWER: **Palamedes** of Nauplia

19. In a novel by this author, a criminal called The Unnamed decides to free his prisoner after meeting with Cardinal Borromeo. For 10 points each:
[10] Name this 19th-century Italian author of a historical novel about the romance of Renzo and Lucia, *The Betrothed*.
ANSWER: Alessandro **Manzoni**
[10] The last part of *The Betrothed* takes place during a plague. In this other novel, a plague breaks out during a siege after the title character poisons Il Toro at a feast on the Prince's orders.
ANSWER: The ***Dwarf*** [or ***Dvargen***]
[10] In this collection by Boccaccio, ten people tell one hundred stories after fleeing from the Black Death in Florence.
ANSWER: The ***Decameron***

20. Identify the following things from number theory, for 10 points each.
[10] Identify this lemma which states that a polynomial with integer coefficients that factors into two polynomials with rational coefficients, factors into two polynomials with integer coefficients.
ANSWER: **Gauss**'s lemma
[10] Euclid's algorithm is used to find this quantity by recursive division.
ANSWER: **greatest common divisor** [or **gcd**; or **greatest common factor**; or **gcf**; or **highest common factor**; or **hcf**]
[10] Wolstenholme's theorem states that for a prime p greater than three, this operation applied to two p minus one for p minus one is congruent to one mod p cubed. This operation is used to compute binomial coefficients and is contrasted with the permutation.
ANSWER: k-**combination**s [or n **choose** k; or other variables in place of "k", such as "r"]

21. A well-known exposed example of this type of intrusive body forms the Palisades that overlook the Hudson River. For 10 points each:
[10] Name these intrusive sheets of igneous rock that are concordant with the layering of the rocks on which they intrude. They are fed by dikes.
ANSWER: **sill**s
[10] This mushroom-looking intrusive sheet can be conceived of as an inflated sill. Examples include the Devil's Tower in Wyoming.
ANSWER: **laccolith**s
[10] Sills and laccoliths are formed by the intrusion of this substance into existing rock layers. Their namesake "chamber" feeds a conduit in volcanos.
ANSWER: **magma**