ACF Nationals 2013
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Tossups

1. Along with carbon dioxide and nitrogen gas, this compound forms when anthranilic acid is treated with nitrous acid and subjected to diazotization. One method of synthesizing it developed by Kobayashi involves reacting fluoride with a compound substituted with a trimethylsilyl group and triflate. Tetra-phenyl-naphthalene is usually synthesized by reacting this compound with tetra-phenyl-cyclo-penta-dienone. That reaction is an application of the Diels-Alder reaction where this compound is the dienophile. The diradical para- isomer of this compound is an intermediate in the Bergman cycloaromatization reaction. It was discovered when JD Roberts showed that two regioisomers of aniline form when C-14-labelled chlorobenzene is treated with amide in a nucleophilic aromatic elimination-addition reaction. This compound is usually only an intermediate because the sp-hybridized carbon introduces significant ring strain. For 10 points, name this simplest aryne (air-INE).
ANSWER: **benzyne** [or **C6H4**; or **1,2-didehydrobenzene**]

2. In response to this event, August Belmont established his first business and decided to remain in the United States. The Brown Shipley company survived this event only because it received a massive loan from the Bank of England. The collapse of German Briggs and Co. in New Orleans is the traditional start to this event. A contributing factor to this event was the passage of the Distribution Act. That act required the federal government to distribute the budget surplus to states, which moved money from eastern banks to western banks. In response to this event, Congress created the short-lived Sub-Treasury system. Economic historians consider this event to have been sparked by higher interest rates in Britain, which led to a fall in cotton prices that destabilized the American economy. The traditional view of this panic is that it was caused by deflation as a result of Levi P. Woodbury's enforcement of a provision that limited the means by which one could purchase land. For 10 points, name this economic panic frequently blamed on the Specie Circular.
ANSWER: **Panic** of **1837** [or Panic of **1837** after "panic" is read]

3. One character in this novel acquires his interest in medicine from his Native American grandmother, Morning Light. Its main character channels her grief over her lover marrying by knitting a kilometer-long bedspread. Upon being asked why she does not speak, its protagonist uses a glow in the dark stick of phosphorous to write "Because I do not want to." In another scene, Gertrudis returns at the head of a regiment before the protagonist exorcises the ghost of her domineering mother Mama Elena. At the end of this novel, Esperanza becomes free to marry Alex, the son of Dr. John Brown, after the death of Rosaura. This novel is divided into twelve chapters named for the months of the year, and centers on the love between Pedro Muzquiz and its main character, who prepares a quail dish with a sauce made from roses, one of its many recipes. For 10 points, name this magical realist novel about Tita de la Garza that was written by Laura Esquivel.
ANSWER: *Like Water for Chocolate*

4. Using this rule allows one to add additional terms to the left-hand sides of hypotheses in the deduction theorem; in that case, the form of this principle used is known as Pierce's law. The so-called consequentia mirabilis relies only on this result. This is the first derived statement in the *Principia Mathematica*, which proves it by taking the disjunction of the modus ponens and modus tollens to yield "p implies q equals not p or q," then considering what happens if q is allowed to be p. Polyvalent logics are ones lacking this rule, and N-valued logics have versions of this rule applying to N minus one disjunctions of mutual exclusions. Sometimes confused with the principle of bivalence, this law was first stated in Aristotle's *On Interpretation* as the principle of non-contradiction. For 10 points, name this law of classical logic according to which "p or not p" is true for any p, since no other result is possible.
ANSWER: law of the **excluded middle** [or law of the **excluded third**; accept **Pierce's** law before read; accept principle of **non-contradiction** before read]

5. England intervened in this war under the pretext that the royal yacht *Merlin* had not been properly saluted, but the English were defeated at the Battle of Solebay and withdrew via the Treaty of Westminster. Most naval fighting in this war took place hundreds of miles away in the Mediterranean, including the Battles of Stromboli, Augusta, and Palermo. After the Hapsburgs intervened in this war, the Holy Roman Empire was defeated at the Battle of Sinsheim, while Spain lost the fortress of Besancon to France. During this war, one participant experienced the "Year of Disaster," which included the mob lynching of its Grand Pensioner. That same participant also saw the death in battle of its greatest admiral, Michael de Ruyter. The major outcome of this war was the annexation of Franche-Comte by Louis XIV, whose true ambitions in this war were foiled by a policy of defensive flooding. For 10 points, name this war ended by the Treaty of Nijmegen fought over control of the Low Countries.
ANSWER: Franco-**Dutch** War

6. According to this religion, cucumbers are foods that contain high amounts of the essence of goodness and are offered only to the chosen. In China, its religious leaders were referred to as "Ma-Huang," or "yellow hemp," since the actual term of "Mo-Wang" is homonymous with "Demon King." Followers of this religion included Mar Ammo and Faustus of Mileve. This religion's demon of Az was later incorporated into Zoroastrianism, and it believes in a World of Darkness that follows the Three Creations. The church is divided into the "chosen" or the "elect," who take the vows of the religion, and the "hearers," who are believers who have not yet taken the vows. This religion's eponymous prophet wrote a 22 part gospel, the Evangelion. This religion was persecuted by the Sassanid Dynasty, but is perhaps best known as the former faith of the author of *City of God*. For 10 points, name this religion abandoned by St. Augustine that was known for its dualism.
ANSWER: **Manichaeism**

7. For his son, a talented clarinet player, this composer wrote his *Eight Pieces for Clarinet, Viola, and Piano*. Willy Hess premiered the A minor violin *Serenade* of this composer, whose Opus 46 includes a second movement Adagio cantabile that quotes the folk song "Hey, the Dusty Miller." During his lifetime, he was renowned for his secular oratorio *Odysseus*, although he's better known today for a chamber work whose second melody quotes Isaac Nathan's arrangement of "O Weep for Those Who Wept on Babel's Stream." Like Brahms, he wrote a violin concerto for Joseph Joachim; that G minor concerto begins with a movement marked *Vorspiel*. The novels of Walter Scott inspired this composer's *Scottish Fantasy*. He also composed an "adagio for cello and orchestra" which sets a Jewish prayer recited on Yom Kippur. For 10 points, name this late Romantic German composer known for his first violin concerto and his composition *Kol Nidrei*.
ANSWER: Max **Bruch**

8. After being refused a kiss, a character in this play exclaims "you forget yourself; a woman dipped in blood, and talk of modesty?" Its first scene ends with that character returning a dropped glove to a woman who immediately takes off her other glove to signify her repulsion to his touch. This play's subplot takes place in a madhouse where Lollio tries to seduce Isabella, the wife of Alibius. In order to pass her husband's virginity test, its main character pays her servant Diaphanta to perform the bed trick on her wedding night. It takes place in Alicante, where its antagonist murders Alonzo de Piracquo to enable its main character to marry Alsemero. That antagonist, De Flores, is obsessed with the villainous Beatrice-Joanna. For 10 points, name this Jacobean tragedy collaborated on by William Rowley and Thomas Middleton.
ANSWER: The ***Changeling**

9. The commutator of a given operator that has an associated one of these returns the original operator scaled by a constant. These map the associated operator's eigenfunctions onto itself, though they may have no eigenfunctions themselves. Solving problems using them is called the algebraic method. The matrix elements of these objects are zero except that they have quantities proportional to the square roots of the natural numbers on the diagonal above or below the main diagonal. In the system for which they are most often used, these can be derived from the commutator of two different components of the associated operator, which is plus or minus i times h-bar times the third component. In that same system, applying one of these repeatedly allows one to show that the system has a ground-state energy of half h times the frequency. Usually constructed for the angular momentum operator for a quantum harmonic oscillator, for 10 points, name these operators that cause an eigenvalue to increase or decrease by one unit.
ANSWER: angular momentum **ladder** operators [or **creation** and **annihilation** operators; or **raising** and **lowering** operators; or **promotion** and **demotion** operators]

10. Carol Kramer claimed that this invention was a major reason for the decline of matriarchal societies because it was almost exclusively used by men. Jerolyn Morisson and Douglas Park analyzed the success of this invention by studying notches in the walls on Crete. Techniques called jiggering and jollying were frequently employed by people using this invention. Unlike the Yangshao culture of the Yellow River valley, the later Longshan culture employed this invention, which it used to create "black" items. In the Western Hemisphere, a technique involving beating large coils was used instead of this invention. Early examples of this invention included the tournette, which was gradually replaced by the "kick" or "fast" type of it. A triangular support was placed under one of these devices, which functioned by rotating a large stone. For 10 points, name these devices that were used to "throw" clay in order to form ceramics.
ANSWER: **pottery wheel** [or **potter's wheel**]

11. In one of this director's films, the soundtrack goes silent for 36 seconds as Odile, Franz, and Arthur dance in a cafe. Another of his films features Sam Fuller describing a "battleground" of "love, hate, action, violence, death - in one word: emotions," and ends with the title character painting his face blue and using red and yellow dynamite to blow himself up. This man directed a film that ends with a notorious scene of cannibalism and begins with the murderous Corinne and Roland trapped in an epic traffic jam. His best-known film has an ambiguous ending centering on the word "dégueulasse," which is sometimes translated as "puke." In that film, Patricia, who sells the *New York Herald Tribune*, betrays her Bogart-loving criminal boyfriend Michel, who is played by Jean-Paul Belmondo. He directed *Band of Outsiders* and *Pierrot le fou*. For 10 points, name this iconic French New Wave director of *Week End* and *Breathless*.
ANSWER: Jean-Luc **Godard**

12. The characteristic distance for these phenomena can be calculated using the Bakkehoi-Domaas-Lied method or from the one-dimensional Voellmy model. The Ryggfonn Experimental Site was created to study these. Exceptionally powerful ones can cause frictionite to form. The lower fracture surfaces that they form are called stauchwalls, while the corresponding upper surface is the crown. Surface hoar failure can lead to them, as can excessive cornice mass. Slabs are generally the most dangerous type of these events. The behavior of these includes flow, loose, and powder. The paths that these events follow are called tracks, and their deposition areas are called run-out zones. For 10 points, name this form of mass wasting that is the sudden movement of snow down a slope, like a mountain.
ANSWER: **avalanche**s [prompt on mass **wasting** before read]

13. This bill was originally introduced by Congressman Mike Rogers of Michigan. A February 12 executive order addresses some of the same issues as this bill. An April 16 amendment to this bill added a provision that would allow the filing of private lawsuits to enforce limits on the activity this bill authorizes, and was added in a House Committee in response to criticism from the ACLU. On April 16, it was revealed that backers of this bill had outspent opponents 38 to 1 on lobbying. A key sticking point for opponents of this bill is the definition of "threat information." In the previous Congress, this bill had been introduced with a companion called SOPA that sought to regulate copyright infringement. The stated purpose of this bill is to improve the government's ability to fight hackers. For 10 points, name this proposed law that would make it easier for websites to monitor and share customer data with the federal government.
ANSWER: **CISPA** [or **Cyber Intelligence Sharing and Protection** Act]

14. The largest conflict in this event saw the death of Brigadier Mallaby. During this event, over 400 people died in the Rawagede massacre, which occurred as a result of Operation Product after one side violated an act that was later rectified by the Renville Agreement. Captain Abdul Aziz briefly led the Makassar Uprising and was arrested for his actions after this event. Operation Crow occurred during this event and was able to capture the capital city in one day, though leaders like General Sudirman were able to escape and engage in guerilla warfare. One of the most notable leaders of this event was a man nicknamed "The Proclamotor." That man was Mohammed Hatta, who became his country's first vice president. For 10 points, identify this 1945 to 1949 event that ended in Dutch recognition of a country led by Sukarno.
ANSWER: **Indonesian war of independence** [or equivalent answers]

15. In one of this author's novels, Mike Slattery and Lloyd Williams conspire to break off a relationship between trumpet player Charley Bongiorno and the protagonist's daughter Ann. That novel focuses on John Chapin, a small-town lawyer who aspires to become President of the United States. Another of this author's main characters either jumps or is pushed over the side of a boat leaving New York City for Massachusetts and is based on Starr Faithfull. He wrote a novel that begins with Gloria Wandrous waking up in the apartment of Weston Liggett. This author of *Ten North Frederick* fictionalized his hometown Pottsville, Pennsylvania, as Gibbsville in a novel whose protagonist throws a drink at Harry Reilly and gets into a fight with Froggy Ogden. That novel describes the downfall and suicide of Julian English. For 10 points, name this American author of *Butterfield 8* and *Appointment in Samarra*.
ANSWER: John **O'Hara**

16. Thoc5 and Aly act to stop one protein in this process from self-inhibiting. In yeast, Los1 carries out a non-essential mechanism for doing this, while a more important yeast mechanism for it is based on the Mtr2-Mex67 dimer. A shortened product indicates this process has occurred when using the pgTat indicator vector. Nxf1 acts as an escort during the earlier stages of this process after being recruited by the TREX complex. It does not directly involve recognition of leucine rich regions, but the CRM1 protein carries out this function for some molecules with the help of the PHAX adaptor. Subtypes "t" and "5" of a certain type of karyopherin mediate this process. The HIV protein Rev allows this process to occur before splicing can take place. This process and similar occurrences involving proteins are aided by RanGTP, which helps move materials through nuclear pore complexes. For 10 points, name this process in which a certain type of nucleic acid leaves the nucleus.
ANSWER: **RNA export** from the nucleus [or **ribonucleic acid export**; accept word forms; prompt on partial answer]

17. In one painting, this artist showed a boy laying face-down on a plank across a pond, while, in the center, John Dalton collects marsh gas for his scientific experiments. This artist, who painted the Lord Protector in conversation with John Milton in *Cromwell, Protector of the Vaudois*, depicted *The Romans Building a Fort at Mancenion* in the first of his cycle of twelve murals adorning Manchester Town Hall. An umbrella is held over a woman wearing a pink ribbon in her bonnet in a circular seascape by this artist that was inspired by Thomas Woolner's emigration to Australia. Thomas Carlyle can be seen on the right of a canvas that this man spent thirteen years working on that depicts British bourgeois to the left and laborers struggling to earn a living in its center. For 10 points, name this painter of *The Last of England* and *Work* who was a member of the Pre-Raphaelite Brotherhood, and whose grandson wrote *The Good Soldier*.
ANSWER: Ford Madox **Brown**

18. One person with this name was a progenitor of the royal house of Libya whose descendants founded Cyrene; that woman with this name is the daughter of Tityas and mother by Poseidon of Euphemus, the Argo's helmsman. The best-known figure with this name has the Homeric epithet "far-famed" in the Iliad, which does not recount her fondness for saffron crocuses. Her confused family includes possible mothers Argiope, Cassiopeia, or Telephaassa, while Homer and Hesiod both attribute her father not as Agenor, but rather as Phoenix, who is in other sources her brother. For 10 points, name this Princess of Tyre who was given a faultless javelin, the dog Laelaps, and the bronze man Talos after she was taken to Crete by a bull.
ANSWER: **Europa**

19. This author explained the origins of an oddly bent tree on the estate of Atedius Melior in a collection whose fifth book includes an "Ode to Sleep." Juvenal's seventh satire attacks this author as a pimp who needs to prostitute his now-lost play *Agave*. In the fourth book of one of his poems, Manto summons a spirit from the underworld and Hypsipyle leaves her baby Opheltes behind, resulting in his being crushed by a snake. The protagonist of one of this author's poems secludes himself in drag in the court of King Lycomedes to escape the watchful eye of Odysseus. This author wrote an epic poem in which Melannipus has his head ripped off and eaten by Tydeus, as well as a collection describing Rome under his patron Domitian. In addition to writing the *Achilleid* and the *Silvae*, he wrote an epic poem describing how Adrastus leads six other warriors against Eteocles. For 10 points, name this Roman poet of the *Thebaid*.
ANSWER: Publius Papinius **Statius**

20. Saint Jonah became the bishop of this city after his rival, Isidore, was imprisoned for his actions at the Council of Florence-Ferrara. The Italian architect Aloisio the New designed twelve of this city's churches. This city experienced a long civil war after Vasily the Blind was captured in battle. A ruler of this city ordered the creation of the first Valdai bell, made from the shattered remains of a rival city's bells. This city won a long struggle for power against its rival city, Tver. This city traces its history to a post founded by Yuri of the Long Arm. Mary Tudor chartered a company that had a monopoly on trade between this city and England. A ruler of this city won the Battle of the Vozha River, then earned a nickname by defeating Mamai Khan at the Battle of Kulikovo on the River Don. For 10 points, name this city ruled by Rurikid Grand Princes such as Dimitry Donskoii, Ivan Moneybags, and Ivan the Great, which is now the capital of Russia.
ANSWER: **Moscow** [or **Muscovy**; or **Moskva**; or Grand Duchy of **Moscow**; or Grand Principality of **Moscow**]

21. Some 170 of these systems have been discovered by the 2MASS survey, including several with prominent methane lines. They have also been discovered by the WISE survey. One class of these objects is characterized by absorption bands for titanium and vanadium oxide and iron and chromium hydride. Based on their spectral type, these objects are subdivided into the classes T, L, and Y. Tiede 1 was the first of these objects discovered; another of these objects is the companion star Gliese 229B. There is little variation in the radii of these objects, making it difficult to distinguish them from planets. Because these objects are too light to sustain nuclear fusion, they are typically characterized using the lithium test. For 10 points, name these astronomical objects that are a type of cool, low mass star.
ANSWER: **brown dwarf** [or **brown dwarves**]

Bonuses

1. Cauchy's formula states that the traction vector is equal to this mathematical object acting on a unit normal vector. For 10 points each:
[10] Name this symmetrical three-by-three tensor.
ANSWER: **stress** tensor [or **stress** matrix; prompt on **sigma**]
[10] The off-diagonal components of the stress tensor correspond to these quantities. Denoted tau, they give the force per unit area acting at right angles to the face of a differential cube.
ANSWER: **shear** stresses [prompt on **tau**]
[10] The diagonal components of the stress tensor consist of deviatoric terms plus this value. The hydrostatic stress tensor is this scalar value times the identity.
ANSWER: **pressure** [prompt on **p**; prompt on **normal stress**]

2. One building designed by this man has a zig-zag design and is connected by a series of underground tunnels. For 10 points each:
[10] Name this architect who designed the Jewish Museum Berlin along with the Imperial War Museum North in Manchester.
ANSWER: Daniel **Libeskind**
[10] Libeskind may be best known for winning the competition to design this 1,776 foot building in Lower Manhattan. It's now being designed by David M. Childs.
ANSWER: **Freedom Tower** [or **One World Trade Center**]
[10] Apart from Berlin, Libeskind also designed the Jewish Museum in this country. An architect from this country is currently building the sloping W57 housing project in New York, while another designed Can Lis and Can Feliz in Majorca.
ANSWER: Kingdom of **Denmark** [or Kongeriget **Danmark**]

3. This author wrote about the conflict between Italian immigrants and native Argentines in his play *La Gringa*. For 10 points each:
[10] Name this member of the "Generation of 1900," an early twentieth century author born in Montevideo who helped create modern South American drama by writing plays such as *My Son the Doctor*.
ANSWER: Florencio **Sanchez**
[10] This other Uruguayan wrote a short story in which four idiot children kill their sister called "The Decapitated Chicken." He also described an animal that sucks blood out of Alicia's head in his story "The Feather Pillow."
ANSWER: Horacio **Quiroga**
[10] A third Uruguayan author, Julio Herrera y Reissig, is best-known as a proponent of this late nineteenth and early twentieth century literary movement founded by Ruben Dario.
ANSWER: **modernismo**

4. One member of this art movement depicted a steaming ship moving through icy waters in *The Beothic at Bache Post* and was named A. Y. Jackson. For 10 points each:
[10] Name this group whose unofficial members included a painter of bright pioneer landscapes named Emily Carr. Its official members included landscapist Arthur Lismer.
ANSWER: **Group of Seven**
[10] The Group of Seven was based in Canada, which was also the setting of this 1770 painting by Benjamin West. On the left of this painting, a Native American sits with his hand under his chin, while storm clouds billow in the upper right.
ANSWER: *The **Death of** General James **Wolfe***
[10] Group of Seven sort-of member Tom Thomson may be best known for a painting of one of these objects in front of Carcajou Bay. Piet Mondrian's move towards an analytical linear style can be seen in his studies of these objects, including a gray one painted in 1911.
ANSWER: **tree**s [or jack **pine** tree]

5. The revelation of David Petraeus's affair got some Americans to remember the first sex scandal in US history. For 10 points each:
[10] The affair involved an illicit romance between Maria Reynolds and this man, known for his 1790 compromise with Madison and Jefferson that resulted in the placement of the capital in Washington, D.C., and for writing on the national debt. He was also Secretary of the Treasury for Washington.
ANSWER: Alexander **Hamilton**
[10] The Reynolds Affair was revealed to the public by this journalist. He was initially a favorite of Republican politicians until he revealed the Sally Hemings affair of Jefferson, after which he was hated by both parties.
ANSWER: James **Callender**
[10] Even before the Reynolds Affair, Hamilton was a frequent target in the National Gazette, a paper owned and edited by this early American author who savaged early Federalists.
ANSWER: Philip Morin **Freneau**

6. In one account, this battle began when a soldier removed his sword to kill a snake, breaking a tenuous truce. For 10 points each:
[10] Name this battle at which Mordred and Arthur killed each other.
ANSWER: Battle of **Camlann**
[10] In the run up to Camlann, Arthur sent this knight and his brother Bedivere to negotiate with Mordred. He died in the battle attempting to defend Arthur's body.
ANSWER: **Lucan**
[10] Arthur had wanted to avoid battle for 30 days after receiving a warning vision from this knight. He'd recently died in Arthur's invasion of Britain shortly after losing two duels to Lancelot, who was wise to his mid-morning extra strength.
ANSWER: **Gawain**

7. This author responded to the Peterloo Massacre by writing "The Masque of Anarchy." For 10 points each:
[10] Name this English poet of "Hymn to Intellectual Beauty," who eulogized John Keats in his poem "Adonais."
ANSWER: Percy Bysshe **Shelley**
[10] Shelley wrote this essay in response to Thomas Love Peacock's "The Four Ages of Poetry." It argues that poetry improves society by enlarging the imagination, and calls poets "the unacknowledged legislators of the world."
ANSWER: "A **Defense of Poetry**"
[10] Shelley reacted to the French Revolution by writing this poem in twelve cantos, in which Laon and Cythna rebel against the king of Argolis.
ANSWER: The ***Revolt of Islam***

8. Poppaedius Silo commanded one side during this conflict. For 10 points each:
[10] Name this 91 to 88 BC war that pitted Rome against a coalition of various Italian city-states and was named for the fact that it was fought among allies. A war with the same name took place in Greece.
ANSWER: **Social** War
[10] The Social War was sparked in part by the 91 BC death of this Roman tribune, who had proposed granting citizenship to various Italian city-states formerly allied with Rome.
ANSWER: Marcus Livius **Drusus**
[10] In 90 BC, a Roman consul proposed this law that would have granted citizenship to any Italian ally that did not raise arms in the Social War.
ANSWER: Lex **Julia**

9. These objects contain a variety of phrases ranging from "Great Blessing" to "Great Curse." For 10 points each:
[10] Name these strips of paper that you can randomly draw at a Shinto temple that contain your fortune.
ANSWER: **omikuji**
[10] Visitors to a Shinto temple may also see the performance of this sacred dance.
ANSWER: **kagura**
[10] The kagura dance is intended to imitate the dance Uzume performed to lure this kami out of a cave. She is probably the most popular goddess in Japan.
ANSWER: **Amaterasu**

10. Tropical sprue inflames this body part. For 10 points each:
[10] Name this part of the GI tract that contains the jejunum, ileum, and duodenum.
ANSWER: **small intestine**
[10] At the base of intestinal villi, the mucosa folds to form these structures. Stem cells necessary for maintaining the mucosa are found here and these structures also help to secrete water and electrolytes into the intestines.
ANSWER: intestinal **crypt**s [or **crypt**s of Lieberkuhn]
[10] These cells found in the bottom of the crypt contain eosinophilic granules and secrete alpha-defensins and lysozyme to kill off bacteria.
ANSWER: **Paneth** cell

11. The main character of this poem is frightened of a third rail during his nightly backwards voyages through "artificial tunnels." For 10 points each:
[10] Name this poem, whose title character "thinks the moon is a small hole at the top of the sky" and climbs skyscrapers in order to investigate it. Its title was inspired by a newspaper misprint.
ANSWER: "The **Man-Moth**"
[10] "The Man-Moth" was written by this American poet of "In the Waiting Room" and "Filling Station," who spent many years living in Brazil.
ANSWER: Elizabeth **Bishop**
[10] Elizabeth Bishop wrote one of these poems about a sorrowful grandmother and her grandchild sitting in a kitchen. This restrictive poetic form consists of an ending three-line tercet and six six-line stanzas whose lines end with the same six words.
ANSWER: **sestina**s

12. For 10 points each, answer the following about the Gouffé affair.
[10] During her trial, Gabrielle Bompard claimed that she participated in the seduction, murder, and trunk stuffing of Alexandre-Toussaint Gouffé because her lover Michel Eyraud had performed this action on her. This suggestive technique was developed from Mesmerism by the Marquis of Puységur and James Braid.
ANSWER: **hypnosis** [accept anything that indicates that she had been **hypnotized**]
[10] Bompard's defense was attacked by expert witnesses from the Salpêtrière School of Hypnosis, which was established and directed by this man. This so-called "Napoleon of the neuroses" taught Sigmund Freud and names a triad of fever, abdominal pain, and jaundice for infected bile ducts.
ANSWER: Jean-Martin **Charcot**
[10] Gouffé's decomposing body was identified by this criminologist who pioneered many advances in forensics. He established the use of livor mortis in establishing time of death, was the first to use groove patterns to match bullets to the gun that fired them, and refined the technique of blood spatter analysis.
ANSWER: Jean-Alexandre-Eugène **Lacassagne**

13. This reform reserved a quarter of seats for Muslims, who were allowed to vote separately in Muslim-only elections. For 10 points each:
[10] Name this 1909 reform that gave people in India the right to choose representatives on legislative councils.
ANSWER: **Minto-Morley** Reform [prompt on **Indian Councils** Act]
[10] The Minto-Morley Reforms did not solve tensions in India, which were exacerbated by this 1919 event in which a group of Indians gathering to protest the Rowlatt Act were fired on by British soldiers.
ANSWER: **Amritsar** Massacre [or **Jallianwala Bagh** Massacre]
[10] Germany tried to exploit anti-British sentiment in India during this February 1915 attempt to ferment a mutiny among Indian troops in the British army.
ANSWER: **Ghadar** Conspiracy

14. A long-running triangular debate among this thinker, Richard Dawkins, and Mary Midgley began with his 1978 review of *The Selfish Gene*, relating the latter to his pet theory of moral skepticism. For 10 points each:
[10] Name this Anglo-Australian pupil of John Anderson. He is best known for 1977's *Ethics: Inventing Right From Wrong*, which argues that all morals are artificial via the so-called "argument from queerness."
ANSWER: John Leslie **Mackie**
[10] Mackie subscribed to this view according to which the universe is deterministic, but humans still have free will. Mackie defined it in opposition to "hard determinism" and "libertarianism."
ANSWER: **compatibilism**
[10] Mackie's *The Cement of the Universe* is about this concept, as is a Mackie essay about a house almost burning down. Hume's *Inquiry* notes that the problem of induction makes it difficult to define this concept, which he illustrated using billiard balls.
ANSWER: **causation** [accept word forms like **cause** or **causality**]

15. The Cossee-Arlman mechanism is typically used to describe these catalysts. For 10 points each:
[10] Name these catalysts used to produce polymers of terminal alkenes that consist of titanium and aluminum centers.
ANSWER: **Ziegler-Natta** catalysts
[10] Ziegler-Natta catalysts based around vanadium rather than titanium can be used to produce this form of polypropylene, in which the stereocenters alternate with a regular, well-defined pattern.
ANSWER: **syndiotactic** polypropylene
[10] Central to the Cossee-Arlman mechanism is this type of interaction with a hydrogen atom and an unsaturated metal center that forms a special type of three center, two electron bond.
ANSWER: **agostic** interaction

16. In March of 2013, this orchestra released a report admitting that many of its musicians were members of the Nazi Party during the 1930s and '40s. For 10 points each:
[10] Name this orchestra based in Musikverein, which hosts an annual New Year's Concert mainly consisting of pieces by the Strauss family.
ANSWER: **Vienna Philharmonic** [or **Wiener Philharmoniker**]
[10] The Vienna Philharmonic uses the Wiener, or Viennese, version of this woodwind instrument, as opposed to the much more commonly used Conservatoire, or French variety.
ANSWER: **oboe**s
[10] This Austrian composer reworked his oboe concerto into his D major second flute concerto. He also composed a concerto for flute and harp.
ANSWER: Wolfgang Amadeus **Mozart**

17. The title character of this story has trouble killing a live rabbit brought home for dinner. For 10 points each:
[10] Name this story in which the title character responds to the news that her son has died in battle by trapping Prussian soldiers in a loft that she sets on fire.
ANSWER: "**Mother Savage**" [or "La **Mere Sauvage**"]
[10] In this story by the same author, Hauchecorne is an honest man who is embarrassed to be seen picking up the title object. By hiding it, he is accused of looking for money from a stolen pocketbook and is branded a potential criminal.
ANSWER: "The **Piece of String**" [or "La **Ficelle**"]
[10] "Mother Savage" and "The Piece of String" were written by this French author, who also depicted the war between France and Prussia in his stories "Ball of Fat" and "Mademoiselle Fifi."
ANSWER: Henri Rene Albert Guy de **Maupassant**

18. This event undermined NATO's ability to respond to the Hungarian Revolution and it forced the resignation of Sir Anthony Eden. For 10 points each:
[10] Name this late 1956 crisis in which Great Britain, France, and Israel decided to get together and invade Egypt and seize control of the namesake canal.
ANSWER: **Suez** Crisis [accept equivalents]
[10] This man was toppled as Prime Minister of France shortly after the Suez Crisis.
ANSWER: Guy **Mollet**
[10] The three powers involved in the Suez Crisis made a secret pact in this suburb of Paris, which was earlier home to a treaty signed by Turkey.
ANSWER: **Sevres**

19. Symbolized in a circuit as a triangle with a plus and minus on one side, these elements have 5 pins: high input, low input, high source, low source, and output. For 10 points each:
[10] Name these circuit elements that ideally act as comparators in the open loop
ANSWER: **op-amp** [or **operational amplifier**]
[10] An open-look ideal op-amp acts as a comparator because its value for this quantity in the open loop is infinite. This ratio of the output voltage to the difference between the input voltages is the fundamental quantity characterizing any amplifier.
ANSWER: open-loop **gain** [prompt on **A**; prompt on **G**; prompt on **transfer function**]
[10] An ideal op amp also has an infinite value for this quantity, the rate at which the output voltage can change.
ANSWER: **slew** rate

20. For a given function f and point a, this is given at a different point x as the nth derivative of f at a, divided by n factorial, times the quantity x minus a to the nth power, summed over n. For 10 points each:
[10] Name this entity used to approximate a function.
ANSWER: **Taylor** series [or **Maclaurin** series; or **Laurent** series; prompt on **power** series]
[10] According to Taylor's theorem, for the Nth-order Taylor series of f centered at a, this quantity is given by the integral with respect to t from a to x of the N-plus-first derivative of f of t, times quantity x minus t to the N, all divided by N factorial.
ANSWER: **remainder** of the series
[10] The integral form of the Taylor series remainder can be converted to the usual Lagrange remainder by integrating by parts and using this theorem. According to this theorem, if a function is differentiable on an interval, then there is a point where the derivative times the interval width is equal to the total change in the function.
ANSWER: **mean value** theorem

21. For 10 points each, answer these questions about women elected to the Congress in 2012.
[10] The election of Congresswomen Ann McLane Kuster and Carol Shea-Porter from this state made it the first in history to have an entirely female Congressional delegation. Kelly Ayotte and former governor Jeanne Shaheen are its Senators.
ANSWER: **New Hampshire**
[10] This Harvard Law professor, who helped set up the Consumer Financial Protection Bureau, defeated incumbent Scott Brown to win a US Senate seat from Massachusetts.
ANSWER: Elizabeth **Warren**
[10] This Hawaiian became the first Asian-American woman elected to the Senate.
ANSWER: Mazie **Hirono**