



NSC 2018 - Round 19 (Tiebreaker 1) - Tossups

**1. The reaction that creates "elephant toothpaste" from hydrogen peroxide can be catalyzed by a compound of potassium and this element. In the Cativa and Monsanto catalytic cycles, an intermediate with this element bonded to an acetyl (ah-SEE-till) group reacts with water, kicking off this element and forming acetic acid. Vapor-emitting crystals of this element are used to stain TLC plates brown. Of the (\*) diatomic elements, this one is the heaviest. A compound used to nucleate precipitation in clouds is composed of silver and this element, and adding a solution of it to starch turns it black. For 10 points, name this halogen found below bromine, with atomic symbol I (eye).**

ANSWER: iodine [or iodide; or I until read]

<Prieto, Science - Chemistry>

**2. In this state, the Lundin family holds title to rock formations that have over 4,000 petroglyphs and pictographs, and are located at Bear Gulch. A former boomtown in this state is the site of the W. A. Clark Mansion. Fly fishing in this state was popularized by Norman MacLean's story *A River Runs Through It*. The toxic Berkeley Copper Pit was run by Anaconda in this state, whose third-most-populous city was named by Lewis and Clark for the many (\*) waterfalls encountered on the Missouri. A town in Silver Bow County is named for the Continental Divide that runs from Canada through the west of this state. Butte (byoot) and Great Falls are some of its most populous cities. For 10 points, name this "Big Sky Country," a state with capital at Helena.**

ANSWER: Montana

<Bentley, Geography - United States>

**3. This man published such poems as "To the Moon" under the pseudonym Soselo; those poems may have been influenced by his homeland's epic *The Knight in the Panther's Skin*. He is represented as a "semi-moonman" who is told "turn back think again" in a poem from the collection *Calling Out to Yeti*. A 1991 biography describing this man as a "breaker of nations" was written by Robert Conquest. The speaker claims that this man "rolls the executions on his tongue like berries" in an "epigram" by (\*) Osip Mandelstam. In a 1940 novel, this man is allegorized as "Number One," whose government imprisons, interrogates, and executes Nicholas Rubashov. For 10 points, name this dictator portrayed in Arthur Koestler's *Darkness at Noon*, a one-time leader of Soviet Russia.**

ANSWER: Joseph Stalin [or Joseph Vissarionovich Stalin; or Ioseb Besarionis dze Jughashvili; or Iosif Vissarionovich Dzhugashvili]

<Jose, Literature - European>

4. A 1988 book by I. F. Stone argues that this event was intended to preserve faith in democratic institutions. A man at this event attributed the doctrine that the sun and moon are rocks to Anaxagoras. Xenophon's account of this event used Hermogenes as a source. This event's central figure says his *daimonion* forbids him to act wrongly, points out that death is either a deep sleep or a change of place, and reports how the Oracle at Delphi said there was no (\*) wiser man than him. Anytus, Meletus, and Lycon brought the charges of *asabeia*, or impiety, and corruption of the Athenian youth against the defendant in this event. Plato's *Apology* depicts, for 10 points, what event in which a Greek philosopher was sentenced to death by hemlock?

ANSWER: the trial of Socrates [or *The Apology of Socrates* until read; or *Apologia Sokratous* until read]  
<Kothari, RMP - Philosophy>

5. This modern-day country was seized from Spain by a campaign in which the "Western Design" fleet landed in Santiago de la Vega. The poor in this country lived in shantytowns such as Back-a-Wall and Trenchtown and, after receiving no relief from Queen Victoria, joined Paul Bogle in the harshly suppressed Morant Bay rebellion. Some 600 ex-slaves in this country were deported to Nova Scotia in the 1790s at the conclusion of one of its (\*) Maroon Wars. A social and religious movement that developed in this country placed great emphasis on Ethiopia's Haile Selassie (HIGHLY suh-LASSIE). It was once governed by Henry Morgan, and in the 18th century, it was Britain's largest source of sugar. Port Royal was a pirate haven in, for 10 points, what Caribbean country with capital at Kingston?

ANSWER: Jamaica  
<Bentley, History - World>

6. The background structure in this painting may be a triumphal arch erected for Marie de Medici. The center of this painting depicts a man holding both of his gloves in his right hand; that man later commissioned a watercolor copy of this painting that showed its original dimensions. The names of the commissioners of this painting are printed on a shield in its background. This 15-foot-wide painting made for the Kloveniersdoelen (KLO-vuh-NEERS-DOO-luh) was created while the artist's wife (\*) Saskia was dying. A man in a red suit loads his musket next to a dwarf on the right of this canvas. The ensign holds an orange and blue striped flag and stands above a brightly lit young girl in this painting. At its center is Captain Frans Banning Cocq (coke). For 10 points, name this Rembrandt painting of a militia company.

ANSWER: *The Night Watch* [or *De Nachtwacht*; or *The Shooting Company of Frans Banning Cocq and Willem van Ruytenburc*; or *The Militia Company of District II under the Command of Captain Frans Banninck Cocq*; or *De compagnie van kapitein Frans Banning Cocq en luitenant Willem van Ruytenburgh maakt zich gereed om uit te marcheren*]  
<Bentley, Arts - Painting>

7. A grandson of this god who is able to "heal all sorrows" is asked by a crow "why wilt thou kill birds, young king?" In that story, this god visits several dwellings and is given meals of varying quality, after which he sleeps between the houses' owners. In the *Thrymskvida* (THRIM-skvee-dah), this god comes up with the plan to disguise Thor as Freya. This deity fathers Thrall, Karl, and Jarl (yarl) in a section of the *Poetic Edda* in which he is identified as (\*) Rig. This god was sometimes called Gullintanni, since he had golden teeth. Eventually, Loki kills and is killed by this god, the "son of nine mothers." This god has the ability to hear the growing of grass and wool. For 10 points, name this guardian of Bifrost (BEE-frost), who blows the Gjallarhorn (GYAH-lar-horn) to signal Ragnarök (RAG-nah-rock).

ANSWER: Heimdall [or Heimdallr; or Rig until read]  
<Jose, RMP - Other Myth>

**8. This scientist proposed that atoms exist as vortices in the luminiferous aether. A theorem named for this scientist states that, for a barotropic and inviscid fluid, the line integral of the fluid velocity around a closed loop is constant. This scientist is the alphabetically-later namesake of an effect that occurs in throttling valves, in which a gas cools as it expands with no change in (\*) enthalpy. This scientist names a unit whose imperial version is the Rankine. His work on laying the transatlantic telegraph cable led him to be knighted. He calculated the point at which molecules have the minimum possible vibrational motion. For 10 points, name this physicist whose temperature scale is set to zero at absolute zero.**

ANSWER: William Thomson, 1st Baron Kelvin [accept either underlined name; or Lord Kelvin; or Kelvin circulation theorem; prompt on Joule–Thomson effect or Joule–Kelvin effect; do not accept "J. J. Thomson" or "Joseph John Thomson"]

<Kalathiveetil, Science - Physics>

**9. A monarch of this name returned to his kingdom after a long absence, and deposed another prince of this name known as the Pugnacious in favor of his son Conrad. That ruler of this name established a settlement of Saracen archers in Lucera, and was twice excommunicated by Pope Gregory IX for invading Italy rather than going on crusade. A ruler of this name was a cousin of Henry the Lion who abandoned his support for Antipope (\*) Calixtus III after failing to take the fort of Alessandria, which was named for his enemy, Pope Alexander III. An emperor of this name was opposed by the Lombard League and drowned while crossing the Saleph River on the way to the Third Crusade. For 10 points, give this name of the Holy Roman Emperor known as Barbarossa.**

ANSWER: Frederick [or Frederick I Barbarossa; or Frederick II; or Friedrich; or Federico]

<Bentley, History - European>

**10. A city in this country is described as having "orbs of liquid grey" for eyes and an "immortal soul" in a travelogue named this country's "Hours." A party in this country is where Kate Croy tells Merton Densher to marry Milly Theale for her inheritance in the novel *The Wings of the Dove*. During a funeral in this country, a man remarks "I have lived too long in foreign parts" after learning that the title character intended *not* to marry one of its inhabitants. Mrs. (\*) Walker disapproves of a novella's title character for socializing with this country's men; that woman has a final encounter with Frederick Winterbourne in this country before dying of "fever" in its capital. For 10 points, name this country in which Daisy Miller dies from malaria after strolling around the Coliseum.**

ANSWER: Italy [or Italia; or Italian Republic; or Repubblica Italiana]

<Jose, Literature - American>

**11. These things were all introduced by Carleton D. Smith, and some later ones were written by Archibald MacLeish and Robert Sherwood. Robert Trout coined the term for them. The second of them discussed a situation where a few cotton manufacturers were willing to pay starvation wages. The first of these things was addressed mainly to the "overwhelming majority of you who use (\*) banks," and asked people to turn over their privately held gold. Similar speeches were given while their speaker was Governor of New York. Newspaper reports of these speeches usually featured the speaker at a table surrounded by NBC and CBS microphones. The 46th of them defended the president's court-packing scheme. For 10 points, name these radio speeches given by Franklin Delano Roosevelt.**

ANSWER: fireside chats [prompt on Franklin Delano Roosevelt's radio speeches until it is read; do not accept or prompt on just "Franklin Delano Roosevelt's speeches"]

<Bentley, History - American>

**12. Only females of the species *Papilio polytes* (pah-PILL-ee-oh PAWL-ih-teez) exhibit polymorphism of this behavior, which is controlled by a "supergene" named *doublesex*. From the perspective of the signal-receiver, one form of this strategy increases the effective population size of prey. Hammer orchids of the genus *Drakea* are examples of plants pollinated by pseudocopulation, which use this strategy to attract pollinators. Harmless (\*) snakes can look red- and black-banded due to this phenomenon. Palatable species exhibit a honest warning signal, such as aposematism, when engaging in the Batesian form of this strategy. For 10 points, name this adaptive strategy in which a species resembles a model species, such as between viceroy and monarch butterflies.**

ANSWER: mimicry [or word forms; or Müllerian mimicry until read; or Batesian mimicry until read]  
<Grames, Science - Biology>

**13. A concert hall in this city hosted the premieres of the song cycles *Seven Sonnets of Michelangelo* and *Serenade for Tenor, Horn and Strings*. The youngest son of J.S. Bach, Johann Christian, worked for a long time in this city. From 2007 to 2015, Valery Gergiev (vuh-LAIR-ee GAIRG-yiff) was the principal conductor for this city's oldest symphony orchestra, whose music director is now Simon Rattle. An annual concert series in this city traditionally ends with a (\*) "last night" showcasing patriotic music such as "Land of Hope and Glory." Wigmore Hall is located in this city, which hosts an eight-week summer concert series called the Proms. For 10 points, name this city whose concert venues include the Royal Albert Hall and the Royal Opera House in Covent (KUV-int) Garden.**

ANSWER: London [accept the London Bach; accept London Symphony Orchestra] (Both song cycles are by Benjamin Britten.)  
<Magin, Arts - Music>

**14. This task was the specialty of a British organization known as the Newmanry. Chester Nez was the last survivor of a group of men who created a system to make this task more difficult. A contingent of women who assisted in this task were colloquially called WRNS (RENZ) and made use of "bombes" (bombs) designed by Gordon Welchman. Room 40 specialized in this task. The members of the Women's Royal Naval Service were vital in performing this type of task in Huts at (\*) Bletchley Park during World War II. In order to make this task more difficult, Navajo speakers were employed by the Marines. The Allies used a captured Enigma machine to assist them in this task. For 10 points, name this process of intercepting and understanding enemy messages.**

ANSWER: codebreaking [or word forms; or cryptanalysis; or signals intelligence; accept any answers indicating decryption, deciphering, decoding, breaking, or cracking of codes or ciphers]  
<Bentley, History - European>

**15. An essay by this man glibly states that there are "roughly 37" ways which David Lynch's *Lost Highway* can be interpreted. This author attributed the "wonderfully and oddly hollow" prose of contemporary writers to their tendency to watch television in his essay "E Unibus Pluram." He recounts his despair while on board a ship called the *Zenith* in an essay about a week-long cruise. This author of the essay collection *A (\*) Supposedly Fun Thing I'll Never Do Again* wrote a novel taking place in the "Year of the Depend Adult Undergarment," and which depicts The Wheelchair Assassins' attempts to acquire a film that produces boundless happiness for those who view it. For 10 points, name this author of the massive novel *Infinite Jest*.**

ANSWER: David Foster Wallace  
<Jose, Literature - American>

**16. The hot spot that created the Hawaiian Islands is the largest discovered example of the zones of the core-mantle boundary named for having "ultra low" values of this quantity. In the ocean, the depth at which one form of this quantity is minimized is known as the SOFAR channel. Andrija Mohorovičić (MOH-hoh-roh-VEE-cheech) used the discrepancy in two different measures of this quantity to provide evidence for the existence of his namesake discontinuity. For an (\*) S-wave, this quantity is equal to the square root of the bulk modulus divided by the density. Because this quantity is higher for P-waves than S-waves, P-waves are always measured first on a seismograph. For 10 points, name this quantity which, for a sound wave in the air, is around 343 meters per second.**

ANSWER: velocity [or speed; or speed of sound; prompt on Mach 1]

<Minarik, Science - Earth Science>

**17. In this city's suburbs, the wealthy Aquilini family has partnered with the Tsawwassen (suh-WAH-sen) people to open a large new mall. This is the most populous city in a province where "satellite families" will be targeted with a "speculation tax" on top of an existing 20-percent surcharge for foreign home buyers. A place called Insite in this city is the continent's first safe injection site for drug users. It is common to spot (\*) TV stars shopping in its Gastown neighborhood while not shooting in this "Hollywood North." Surrey is south of this city, near the US border. Its mayor Gregor Robertson has been in office since 2008, and oversaw an unusually warm Winter Olympics in 2010. For 10 points, name this most populous city in the province of British Columbia.**

ANSWER: Vancouver

<Bentley, Current Events - Foreign>

**18. The protagonist of a novel by this author recalls weeping at the grave of Father Lorenzo, a monk in Calais with whom he exchanged snuffboxes. In another novel, this author included a page only marked with a large black square facing opposite the page of a major character's death. This author responded to Tobias Smollett in a novel which parodies Smollett as "Smelfungus," and uses Parson (\*) Yorick as a stand-in for this author on his travels through continental Europe. The protagonist of a novel by this author is accidentally circumcised by a window-sash, and uses the term "hobby-horse" to describe his uncle Toby's obsession with siege warfare. For 10 points, name this author of *A Sentimental Journey through France and Italy* and *Tristram Shandy*.**

ANSWER: Laurence Sterne

<Bollinger, Literature - British>

**19. A film by this director opens with a long take that concludes with a bomb going off in Rudy Linnekar's car. In another film, this director played a character who dies at the Boar's Head tavern after he is banished by Prince Hal. He played the police detective Hank Quinlan in a film noir that he directed, which is set largely around the Mexican-American border. This director of *Chimes at Midnight* and (\*) *Touch of Evil* made a film in which the title character has an affair with the amateur singer Susan Alexander, runs for governor of New York, and lives in an estate called Xanadu. For 10 points, name this director who depicted a dying character saying "Rosebud" at the opening of his film *Citizen Kane*.**

ANSWER: Orson Welles [or George Orson Welles]

<Jose, Arts - Film>

**20. Due to their use of this term, the Brahma Kumari movement was originally a *mandali*, or "circle," named for it. The letters of this word are analogized to states of consciousness in the Mandukya Upanishad. This term is followed by "Namah Shivaya" in a phrase used in Saivism, and follows "Hari" in a phrase derived from Vaishnavism. This is the first word in the name of a group that reformed under the name "Aleph" in 2000 after its members (\*) punctured newspaper-wrapped packages with umbrellas to spread sarin gas in the Tokyo subway; that group placed this term before the word "Shinrikyo" (sheen-REEK-yo) in their name. Vedic recitations typically begin with this syllable, which represents the sound of the universe. For 10 points, name this sacred sound from Hinduism often used as a mantra for meditation.**

ANSWER: **om** [or **aum**]

<Brownstein, RMP - Other Religion>

**21. This instrument enters a fifth higher than the soloist in an imitative dialogue that opens the second movement of Samuel Barber's *Cello Concerto*. This instrument and the viola soloist play in different keys at the beginning of Ralph Vaughan Williams's *Flos Campi*. In the orchestral version of *Le Tombeau de Couperin* (luh tom-BOH duh coop-RAN), this instrument's long melodies open the (\*) Menuet and Prelude movements; Ravel also used its slightly larger "d'amore" (dah-MOR-ay) variant in *Boléro*. A lower cousin of this instrument has a solo part in Jean Sibelius's *The Swan of Tuonela*. This instrument represents the duck in Prokofiev's *Peter and the Wolf*. The English horn is a fifth lower than, for 10 points, what double-reeded woodwind instrument whose A is used to tune the orchestra?**

ANSWER: **oboe**

<Kothari, Arts - Music>



## NSC 2018 - Round 19 (Tiebreaker 1) - Bonuses

1. Willow branches are beaten on the ground in order to represent the eradication of sin during this holiday's last day, Hoshanah Rabbah (**ho-SHAH-nah RAH-bah**). For 10 points each:

[10] Name this agricultural holiday in the month of Tishrei (**teesh-RAY**) during which the *lulav* (**loo-LAHV**) and *etrog* (**eh-TROHG**) are shaken in six directions in order to symbolize the omnipresence of God.

ANSWER: **Sukkot** (**soo-COTE**) [or **Sukkos**; prompt on Feast of Booths; prompt on Feast of Ingathering; prompt on Feast of Tabernacles]

[10] Sukkot is described as a harvest festival in the Book of Exodus, which portrays the "flight" from this modern-day country.

ANSWER: **Egypt** [or **Mitzrayim**; or **Misr**; or **Arab Republic of Egypt**; or **Jumhuriyat Misr al-Arabiyyah**]

[10] Jews circle the synagogue this number of times during Hoshanah Rabbah. Adherents of Islam circle around the Kaaba this number of times during the hajj.

ANSWER: **seven** [or **7**]

<Kalathiveetil, RMP - Bible/Christianity>

2. Name the following genres of Mesopotamian literature, for 10 points each.

[10] The oldest known writer of works in this genre is Enheduanna (**EN-hed-WANNA**), a daughter of Sargon of Akkad. A group of nine canonical Greek writers in this genre, often called the "Melic" ones, includes Anacreon and Stesichorus.

ANSWER: **poetry** [or **poems**; or **odes**; or lyric **poems**; or lyric **poetry**; do not accept "epic poems"]

[10] Perhaps the most familiar piece of ancient Mesopotamian literature is the story of Gilgamesh, which belongs to this genre that also includes the *Odyssey*.

ANSWER: **epics** [or **epic poems**]

[10] Many works of Mesopotamian literature were in this genre, which generally consists of advice from sages to younger generations. Examples of this genre include the "Sapiential Books" of the Bible, such as Proverbs.

ANSWER: **wisdom** literature

<Alston, Literature - World>

3. Elmer Ellsworth, a volunteer in a regiment named for these troops, was the first Union officer to die during the Civil War. For 10 points each:

[10] Identify these soldiers who originally fought for the French. They were of Berber ethnicity and characterized by their bright red trousers and fez.

ANSWER: **Zouaves** (z'WAHVZ) [or **Zoo-Zoos**]

[10] Francis Brownell, a member of the Fire Zouaves, was the first Union soldier in the Civil War to receive this highest military decoration. Only about 3,500 have ever been awarded.

ANSWER: U.S. **Medal of Honor** [or Congressional **Medal of Honor**; or **Medal of Valor**]

[10] Ellsworth organized a prominent Zouave regiment from this state. The Camp Douglas POW camp in this state was named for a politician from here who came fourth in electoral votes in the 1860 presidential election.

ANSWER: **Illinois**

<Bentley, History - American>

4. Identify some music that Benjamin Grosvenor (**GROVE-ner**) performed in a piano recital I went to last month. For 10 points each:

[10] Grosvenor led off with a 7-movement J. S. Bach work of this form in G major, the fifth in a group of 6 that were later called "French." Handel's "The Harmonious Blacksmith" is from one of these Baroque collections of dances that have an allemande (**AL-uh-mond**), courante (**koo-RONT**), and gigue (**zheeg**).

ANSWER: **suites** [or dance **suites**; or keyboard **suites**; or piano **suites**; or **partitas**; or **ouvertures**; or **ordre**; accept **French Suites**]

[10] He played this composer's formidable Opus 1, a nearly atonal piano sonata in one movement, "Mäßig bewegt" (**MESS-ish buh-VAKED**). This composer used his teacher's "developing variation" technique on the sonata's opening leitmotif: a rising perfect fourth, then an augmented fourth.

ANSWER: Alban **Berg** (**ALL-bahn BAIRG**)

[10] He played the last four piano pieces, Opus 119, by this German composer of four symphonies, who listed himself as the "arranger" of his *Hungarian Dances* for piano four-hands.

ANSWER: Johannes **Brahms**

<Lifshitz, Arts - Music>

5. These structures, which can come in stacked or unstacked types, are broken down by a namesake resolvase. For 10 points each:

[10] Name these cross-shaped junctions of DNA. Base pairs are exchanged during branch migration in these structures.

ANSWER: **Holliday** junctions

[10] Holliday junctions are important to genetic recombination, which commonly happens during this process. In this process, which occurs during prophase I (**one**), homologous (**huh-MAH-luh-guss**) chromosomes that have paired up to form a synapsis exchange genetic information.

ANSWER: chromosomal **crossing over** [or chromosomal **crossover**]

[10] Crossing-over occurs during prophase I, the first stage of this process. In this process, which is the first stage of oogenesis (**OH-oh-genesis**) and spermatogenesis, a diploid somatic cell divides to form four haploid gametes.

ANSWER: **meiosis** [do not accept "mitosis"]

<Kothari, Science - Biology>

6. This author wrote a "Personal Remembrance" of Joseph Conrad, as well as the book *The English Novel: From the Earliest Days to the Death of Joseph Conrad*. For 10 points each:

[10] Name this author who wrote novels in collaboration with Conrad, including *Romance*, *The Nature of a Crime*, and *The Inheritors*.

ANSWER: Ford Madox **Ford** [or Ford Madox **Hueffer**]

[10] In this novel by Ford Madox Ford, John Dowell recounts his wife Florence's affair with their friend Captain Edward Ashburnham, and her subsequent suicide.

ANSWER: *The **Good Soldier***

[10] John Dowell is this type of storyteller whose credibility is questionable. The narrator of *Vanity Fair* exemplifies this type of point of view by repeating untrue gossip and skewing the truth.

ANSWER: **unreliable** narrator

<Grames, Literature - British>

7. Some two million people were arrested for allegedly belonging to this class of people, since they might "grow as a class of capitalists and liquidate the dictatorship of the proletariat." For 10 points each:

[10] Identify this Russian term for "rich peasants."

ANSWER: **kulaks** (koo-LAHK or koo-WAHK) [do not accept "gulags"]

[10] The kulaks were targeted by this Soviet leader notorious for his purges. He led the Soviet Union during World War II.

ANSWER: Joseph **Stalin** [or Joseph Vissarionovich **Stalin**; or Ioseb Besarionis dze **Jughashvili**]

[10] Many kulaks were sent to exile in this modern-day country. In 1960, over 1.6 million hectares of new land were plowed in this country as part of the Virgin and Idle Lands campaign.

ANSWER: **Kazakhstan** [or Republic of **Kazakhstan**]

<Bentley, History - European>

8. Bored? Answer the following about the social science of boredom, for 10 points each.

[10] Havermans et al. linked boredom to a form of this behavior. A 1974 study by Tomsovic investigated the "binge" form of this activity.

ANSWER: binge **drinking** [or **alcohol** consumption; or obvious equivalents]

[10] In the paper "Just Think: The Challenges of the Disengaged Mind," Wilson et al. showed that men would rather perform this action on themselves than sit idle in a room for 15 minutes. Actors faked having this happen to them in the Milgram experiment.

ANSWER: administer electric **shocks** [or receive electric **shocks**]

[10] Mercer and Eastwood studied the link between boredom and the problematic form of this activity. The St. Petersburg paradox concerns a form of this activity with an infinite expected value.

ANSWER: **gambling** [or online **gambling**; or **betting**; or the **lottery**; or going to a **casino**; or similar answers]

<Bentley, Social Science - Psychology>

9. This algorithm underlies the OpenSSL library, which allows securely transmitting data. For 10 points each:  
[10] Name this encryption algorithm whose name is an abbreviation for its three inventors. The Coppersmith method can be used in attempts to attack this algorithm.

ANSWER: **RSA** algorithm [or **Rivest–Shamir–Adleman** algorithm]

[10] RSA relies on the difficulty of being able to quickly compute these kinds of factors. These kinds of numbers have no factors other than one and themselves.

ANSWER: **prime** numbers

[10] The encryption function in RSA is this general kind of function, which is easy to compute in one direction, but nearly impossible to invert. This kind of function is also used in the Diffie–Hellman key exchange.

ANSWER: **trapdoor** functions [accept **one-way** functions; anti-prompt on cryptographic **hash** functions]

<Jose, Science - Computer Science>

10. Identify the following about the sculptures of Otto Gutfreund (**GOOT-froynt**), for 10 points each.

[10] Gutfreund was one of the first artists to create sculptures in this style. Another sculpture created in this style is a guitar made from wire and sheet metal by one of its founders, Pablo Picasso.

ANSWER: **Cubism** [or Analytical **Cubism**]

[10] Gutfreund's sculpture of this literary character renders him with an almost conical head, terminating at his beard. Picasso made a monochrome drawing of this title character under a child-like sun.

ANSWER: **Don Quixote**

[10] Before turning to Cubism, Gutfreund was a devotee of this "Michelangelo of caricature" who himself made many Don Quixote paintings. This French artist's paintings include *Third Class Carriage*.

ANSWER: Honoré **Daumier** (**dome-YAY**) [or Honoré-Victorin **Daumier**]

<Bentley, Arts - Sculpture>

11. The subject of this event hallucinates "red hounds" running around him before it occurs, and its impending occurrence also causes the subject to note that Russia "clearly doesn't" need him and to call Madame Odintsova beautiful. For 10 points each:

[10] Identify this event caused by a neglected cut incurred while its subject performs an autopsy on a typhus victim.

ANSWER: the **death** of (Yevgeny Vasilevich) **Bazarov** [prompt on partial answers]

[10] The nihilist Bazarov and his friend Arkady Kirsanov both appear in this Russian author's 1862 novel *Fathers and Sons*.

ANSWER: Ivan **Turgenev** [or Ivan Sergeyevich **Turgenev**]

[10] Bazarov's realization that Russia will find him unnecessary marks him as an example of these Russian literary figures. An 1850 Turgenev novella is titled for "The Diary of" another of them.

ANSWER: **superfluous man** [or **lishniy chelovék**; accept *The **Diary of a Superfluous Man*** or ***Dnevnik lishnego cheloveka***]

<Carson, Literature - European>

12. The Nigerian saxophonist Femi Kuti used this technique to sustain an E-flat for over 45 minutes. For 10 points each:

[10] Name this type of breathing used to continuously play a musical instrument. It involves inhaling air through the nose while exhaling through the mouth.

ANSWER: **circular** breathing

[10] Circular breathing is used to continuously play this musical instrument, referred to by the Warray people as a *bambu*. This Australian instrument is placed on the ground before the player blows into it.

ANSWER: **didgeridoo** [or **didjeridu**; or **yidaki**; or **mandapul**; prompt on **dronepipe**]

[10] Pungi players often use circular breathing while engaging in this activity. People who made their living in this activity staged a protest at the Charkhi Dadri Temple after being targeted by a 1972 Indian Wildlife Protection Act.

ANSWER: **snake charming** [or word forms; or **cobra charming**; prompt on **snake handling** or **snake dancing**]

<Jose, Mixed/Other/General Knowledge>

13. Some traditions hold that this woman was transformed into a dog while she was on a ship bound for Greece. For 10 points each:

[10] Name this woman whose children included the seer Cassandra and the warrior Hector.

ANSWER: **Hecuba**

[10] This king of Thrace was blinded by Hecuba after he killed Polydorus, another son of Hecuba. In Euripides's play *Hecuba*, this man's sons are also murdered by Hecuba's attendants.

ANSWER: **Polymestor** [or **Polymnestor**]

[10] All of the aforementioned children of Hecuba had this king of Troy as their father. *The Iliad* closes with the corpse of Hector being returned to this king.

ANSWER: **Priam**

<Jose, RMP - Greco-Roman Myth>

14. Answer the following about the thermodynamic square, for 10 points each.

[10] The thermodynamic square was introduced by this German scientist, who won a Nobel Prize for his interpretation of the wavefunction as a probability amplitude.

ANSWER: Max **Born** [accept **Born** interpretation]

[10] The four corners of the square are entropy, pressure, temperature, and this quantity. In Boyle's law, this quantity is multiplied on both sides by pressure.

ANSWER: **volume** [prompt on  $V$ ]

[10] Variables on two adjacent corners are these kinds of variables for the potential in between, since knowing the value for the potential and these variables allows one to quickly calculate the other two thermodynamic variables. For example, pressure and temperature are these variables for Gibbs free energy.

ANSWER: **natural** variables

<Prieto, Science - Physics>

15. This term was coined in an article by Heinz Valk, which argued that a nation which makes change by "smiling" and doing the namesake action is a "sublime example of the world." For 10 points each:

[10] Give this term describing the mass protests in Vilnius and Riga that led to the independence of the Baltic States from the USSR.

ANSWER: **Singing Revolution**

[10] Valk was from this northernmost of the Baltic states, whose capital is Tallinn. It achieved independence from the Soviet Union in 1991.

ANSWER: Republic of **Estonia**

[10] In 1989, 2 million people from the three Baltic countries formed a human chain as part of the "Baltic Way" protests on the 50th anniversary of this agreement. Estonia, Latvia, and Eastern Poland were marked as Soviet spheres of influence by this 1939 pact.

ANSWER: **Molotov–Ribbentrop** Pact [or the **Nazi–Soviet** Pact; **German–Soviet** Non-aggression Pact]

<Jose, History - European>

16. The critic R. P. Blackmur listed nineteen words that this poet "fished from obscurity," including "princox" and "fubbed." For 10 points each:

[10] Name this author who wrote "The moonlight fubbed the girandoles" in his poem "The Ordinary Women," mentioned "bauds of euphony" in his poem "Thirteen Ways of Looking at a Blackbird," and wrote "The Emperor of Ice Cream."

ANSWER: Wallace **Stevens**

[10] According to Helen Vendler, Stevens's usage of this adjective to describe "curds" in "The Emperor of Ice Cream" conveys a "deliberate materiality." This obscure adjective means "lusty" or "charged with sexual desire."

ANSWER: **concupiscent** [accept **concupiscent** curds]

[10] "The Emperor of Ice Cream" appears in this first book by Wallace Stevens. Its poem "The Plot Against the Giant" imagines "Heavenly labials in a world of gutturals."

ANSWER: **Harmonium**

<Jose, Literature - American>

17. A specific form of this technique named for Boris Delaunay (**duh-loh-NAY**) ensures that no individual point in a set of discrete points is contained in a circumcircle. For 10 points each:

[10] Name this technique in which a vertex is picked, and lines are connected to every nonadjacent vertex, subdividing the entire surface into 2-simplexes.

ANSWER: **triangulation** [accept Delaunay **triangulation**; prompt on **tessellation**]

[10] The Delaunay triangulation is the dual graph of one of these diagrams, which are created by partitioning a plane based on its seed points.

ANSWER: **Voronoi** diagrams [or **Voronoi** tessellations; or **Voronoi** decompositions]

[10] After triangulation is performed, the remaining side lengths of the triangle are calculated using a law named for this trigonometric function, whose reciprocal is the cosecant.

ANSWER: **sine** [or **sin**]

<Kalathiveetil, Science - Math>

18. This man's essay "Cogito and the History of Madness" was the first to use the term *differance* (deef-RAHNCE), which is often translated as "meaning is always deferred." For 10 points each:

[10] Name this French philosopher whose book *Of Grammatology* introduced deconstructionism, a method of literary criticism.

ANSWER: Jacques **Derrida** [or Jackie Élie **Derrida**]

[10] Derrida discusses writing as a *pharmakon* in a book titled for this Greek philosopher's "Pharmacy." Derrida notes that one form of the word *pharmakon* appears nowhere in the dialogues that this philosopher wrote featuring his teacher Socrates.

ANSWER: **Plato** [accept **Plato's Pharmacy**]

[10] *Of Grammatology* contains an oft-translated statement saying that "there is no outside" version of this thing. The original version of that statement attempts to show how all language is dependent on other language.

ANSWER: **text** [or **texte**; accept "there is nothing outside the **text**"; accept "il n'y a pas de hors-**texte**"]

<Jose, RMP - Philosophy>

19. Jim Woodmann constructed a balloon using primitive materials in order to show the plausibility of the "balloon theory" regarding these things. For 10 points each:

[10] Identify these archaeological features which include the Condor and the Hummingbird. Jainer Jesus Flores Vigo was arrested for using a truck as an "attack against cultural heritage" on these things in 2018.

ANSWER: **Nazca Lines** [or **Nasca Lines**; or **Andes Lines**; or **Nazca Drawings**]

[10] The Nazca were based in this country. The Incan capital Cuzco was located in this country.

ANSWER: **Peru** [or Republic of **Peru**]

[10] Earthworks are the signature features of this other Pre-Columbian settlement and UNESCO World Heritage site. This city dominated the Late Woodland Period and was home to Woodhenge.

ANSWER: **Cahokia** [or **Cahokia Mounds State Historic Site**]

<Bentley, History - World>

20. A group of artists called the "Shoreham Ancients" devoted themselves to producing paintings in the style of this artist. For 10 points each:

[10] Name this British Romanticist, who "illuminated" many of his books, such as *All Religions Are One*, with his own art. One of his series of works repeatedly depicts the "Great Red Dragon."

ANSWER: William **Blake**

[10] Blake often used this type of paint, which is made by mixing pigments with an aqueous solution. In French this technique is called *aquarelle* (aqua-RELL).

ANSWER: **watercolor** painting

[10] In 2006, the Tate Modern hung Blake's *The Ghost of a Flea* next to this painting, with which it is often compared. A horse's head emerges from curtains in the background of this painting by Henry Fuseli (**FUSE-lee**).

ANSWER: *The **Nightmare***

<Jose, Arts - Painting>

21. Participants in these events often stripped to the waist to prevent the chance of cloth causing an infection.

For 10 points each:

[10] Identify these events, in which two men would resolve a matter of honor by firing pistols at each other.

ANSWER: **duels**

[10] These people, usually friends of the men about to duel, would arrange the duel and handle communication between the principals.

ANSWER: **seconds**

[10] This practice, sometimes called a judicial duel, was introduced to England by William I. These events were a way to resolve a trial without witnesses, with the winner proclaimed to be correct.

ANSWER: **trial by combat** [or **wager of battle**; or **trial by battle**; do not accept "trial by ordeal"]

<Bentley, History - European>



