2020 Reinstein Set – Packet 10

Tossups

1. This person negotiated with the Duke of Buckingham for English ships that were used in the Recovery of Ré island. This person negotiated the Treaty of Monzón after directing the capture of Valtellina [val-tay-LEE-nuh]. This person found out about a conspiracy between the Marquis de Cinq-Mars [mahr-kee duh sank-mar] and King Philip IV of Spain, which led to the beheading of Cinq-Mars. This person paid a person to kill Count of Soissons [swuh-sawn] in revenge for a plot to kill this person. This person often had conflicts with Marie de' Medici [MEH-duh-chee]. Name this minister who curtailed the Habsburgs during the Thirty Years' War and who was succeeded by Cardinal Mazarin.
Answer: Armand du **Plessis**, Cardinal **Richelieu** [accept either underlined name]

2. This moon has several large impact craters, including Anzu and Epigeus [eh-PIJ-ee-uss]. Much of the surface of this moon has grooves in areas such as Mysia Sulci [MY-see-uh SUL-"sigh"] and Uruk Sulcus [OO-rook SUL-kuss]. In the 1990s, this moon and Europa became the first two moons to have oxygen atmospheres detected. This moon has a metallic core and became the first moon to have a magnetic field detected thanks to the *Galileo* spacecraft. After orbiting this moon's planet, the JUICE spacecraft will orbit this moon. This moon is slightly larger than Titan, making it the largest moon in the solar system. Name this largest moon of Jupiter.
Answer: **Ganymede** [GAN-ih-meed]

3. This river starts near the town of Cape Vincent, and a widening of this river forms Lake Saint Pierre, which has an archipelago [ark-ih-PEL-uh-goh] with over 100 islands. The water from this river passes by Anticosti [ahn-tee-KOHSS-tee] Island before entering a gulf that shares its name. The Gaspé [gas-pay] Peninsula is the south side of this river's mouth. This river's namesake gulf contains Cape Breton [BREH-tun] Island, Prince Edward Island, and the west side of Newfoundland Island. This river goes through Montreal and Quebec City. Name this river that flows northeast from Lake Ontario, forming part of the border between New York and Canada.
Answer: **St. Lawrence** River

4. In a letter that is now considered a poem, this person wrote "I labor to be concise; I become obscure." That poem, which compares painters and poets, was written by this person to the Piso [PEE-soh] family. This person's poem addressed to Lucinius Murena [loo-SIN-ee-uss moo-RAY-nuh] says "Whosoever loves the golden mean, is secure from the sordidness of an antiquated cell." John Dryden paraphrased this poet by writing "Tomorrow, do thy worst, for I have lived today." Those words come from this writer's four book of odes, which precede his book of epodes [EP-"odes"]. Name this ancient Roman poet who wrote the *Ars Poetica* and the words "Seize the day."
Answer: **Horace** [or Quintus **Horatius** Flaccus]

5. The "double" version of this phenomenon takes place in birefringent ["by"-ree-"FRINGE"-ent] materials and was explained by Augustin-Jean Fresnel [oh-goo-stan zhahn fruh-nel] using polarization. This phenomenon happens according to Fermat's [fear-mah'z] principle, which is also called the principle of least time. Beyond the critical angle, total internal reflection occurs instead of this phenomenon. Snell's law quantifies this phenomenon by giving an angle. Dividing the speed of light in a vacuum by the speed of light in a material gives the "index of" this phenomenon. Name this phenomenon in which light bends when it travels from one medium to another.
Answer: **refract**ion [accept **refract**ing; do not accept "diffract(ion)"]

6. This jazz musician often performed with his sons Dan, Chris, and Darius and with the drummer Joe Morello. This person worked with his wife Iola and Louis Armstrong on the musical *The Real Ambassadors.* Many of the songs associated with this pianist were actually written by his saxophonist, Paul Desmond. This composer's 1962 album *Countdown—Time in Outer Space* was dedicated to John Glenn. Like many of his albums, that one has a wide variety of time signatures. Name this musician whose *Time Out* album features "Blue Rondo à la Turk" and "Take Five".
Answer: (David Warren) "Dave" **Brubeck**

7. Akilu [uh-KEE-loo] took many people from this city to Walata [wuh-LAH-tuh] to avoid the repressive rule of Sonni Ali. After that, Askia Mohammad I helped bring this city back to prominence by using many of its people as advisers. The first European person to reach this city was Gordon Laing, who died soon after leaving it. A chief judge of this city, Al-Qadi Aqib ibn Mahmud ibn Umar [ahl KAH-dee ah-KEEB ee-bin MAH-mood ee-bin OO-mar], used the dimensions of Mecca's Kaaba to design this city's Sankore [SAHN-kor-ay] Madrassah. That building was further developed by a leader who may have been the richest man in history, Mansa Musa. Name this city that was a center of learning and is in what is now Mali.
Answer: **Timbuktu**, Mali

8. One of this author's characters is the daughter of a man who nailed himself into his attic and threw the hammer out the window. According to this author, that woman refused to marry a man who insisted she give birth to a son first, and her return to his old home caused Clytie to burn it down. That woman, Rosa Coldfield, lived at Sutpen's Hundred and told her story to a Harvard student who appears in another novel by this author. That student is Quentin Compson. Name this author of *Absalom, Absalom!* and *The Sound and the Fury.*
Answer: William (Cuthbert) **Faulkner** [or William Cuthbert **Falkner**]

9. Abraham Lincoln wrote a letter to this person stating "My paramount object in this struggle is to save the Union, and is not either to save or to destroy slavery." That letter was in response to this person's open letter titled "Prayer of Twenty Millions". When this person later ran for President, most of his electoral votes were given to Thomas Hendricks because this person died between the popular and electoral votes. This person served briefly in Congress but was unpopular among congressmen because his newspaper uncovered congressional corruption. Name this founder of the *New York Tribune* who was credited with saying "Go West, young man."
Answer: Horace **Greeley**

10. This person's book *New System of Chemical Philosophy* states that when two elements form a compound, the ratios of the masses is the ratio of small numbers. For an ideal gas, the law named after this person is equivalent to Amagat's [ah-muh-GAHT'S] law. This person's law can be combined with Raoult's law to find total vapor pressure or the vapor pressure from a constituent. This person is the namesake of both a period of low sunspot count and a form of color blindness. Name this English chemist who developed the law of partial pressures and played a major role in developing atomic theory.
Answer: John **Dalton**

11. This character has a dream in which the king of the sea says "The court summons you. Why do you not go?". That dream, following a huge storm, causes this character to leave the Suma coast. This character, who is the son-in-law of the Minister of the Left, impregnates his stepmother, and their son becomes a national leader. This character had many affairs, including ones with Reikeiden [ray-kay-den] and her sister, the Lady of the Orange Blossoms. This character's first wife was Lady Aoi [ow-ee], and after she died he treated Lady Murasaki as though she were his wife. Name this protagonist of Murasaki Shikibu's novel that was written in the 11th century in Japan.
Answer: Prince (**Hikaru**) **Genji** [accept either underlined name; prompt on **Minamoto**]

12.   This process is the primary way that vitamin B_{12} and mono·sodium glutamate [GLOO-tuh-"mate"] are produced. Genetic modification is made to some organisms so that they use this process to create chymosin [ky-MOH-sin], which is used in rennet to make cheese. Though humans primarily use other processes, this process occurs in the digestive tract to produce butyrate [BYOO-tuh-"rate"], and in muscles resulting in lactic acid waste. This process happens to some of the flour when bread is made, causing the bread to rise. Louis Pasteur [loo-ee past-er] studied this process in yeasts. Name this an·aerobic extraction of energy from carbohydrates.
Answer: **ferment**ation or **ferment**ing or being **ferment**ed [accept **anaerobic** (cellular) **respiration**]

13.   A character in this novel states "Conscience and cowardice are really the same things." Another character in this novel later contradicts that by saying conscience "is the divinest thing in us"; because of that, he is going to marry an actress he had just argued with. Unfortunately, the actress had killed herself. Later in this novel, the man who wished to marry gets into an argument with a painter and kills him; he then arranges for Alan Campbell to dispose of the body. Alan Campbell and Sibyl [SI-bul] Vane commit suicide in this novel, and the title character murders Basil Hallward. Name this novel in which the title portrait ages while the title character stays young, written by Oscar Wilde.

Answer: *The **Picture of Dorian Gray***

14.   Claude Vatin [vah-tan] claimed that this person created the *Dancers of Delphi* [DEL-fy], which is also known as the Acanthus Column. One work by this artist depicts a naked goddess holding a bath towel to her side and was built for the Temple at Knidos ["NIGH-dose"]. That work, like many others by this artist, was destroyed and re-created based on depictions of it. An extant work by this artist has a baby god resting on the arm of another god, though the larger god's other arm is now missing. Name this Attic sculptor who worked in Athens and created *Hermes* [HUR-meez] *and the Infant Dionysus* ["die"-oh-NY-suss].

Answer: **Praxiteles** [prak-SIT-uh-leez]

15.   This creature was depicted on the triple-crested helmet of Turnus. Also in the *Aeneid*, Gyas's [gee-AHS'z] ship was named for this creature. This creature was raised by King Amisodarus [ah-MEE-soh-dah-rus]. *The Iliad* says of this creature, "Her gaping throat emits infernal fire." The killing of this creature was demanded by King Iobates of Lycia ["eye"-AH-buh-teez "of lie-SEE-uh"] and was done with a lead-tipped spear to its throat. This creature had a serpent for a tail, a lion's body, and the head of a goat growing out of its back. Name this offspring of Typhon ["TIE"-fahn] and Echidna [uh-KID-nuh] that was killed by Bellerophon [buh-"LAIR"-oh-fahn].

Answer: **Chimera**

16. One version of this practice spread to Europe after starting in Norfolk County, England. That practice led to the brother-in-law of Robert Walpole being nicknamed "Turnip Townshend". This process is helpful in getting rid of pests that are both immobile and require the presence of specific crops to stay alive. This practice has been used since ancient times, and it was improved during the Middle Ages by using legumes in the spring, going from a two-field system to a three-field system. The Norfolk system was an improvement to this practice that avoided leaving land fallow. Name this system of changing which crop grows on which land each year.

Answer: crop **rotation** or **rotating** crops

17. Like MSH, the beta form of this chemical is formed by breaking down beta-liptropin, and its precursor is POMC. When these chemicals produced in the body are bound to receptors, they inhibit substance P and GABA [GAB-uh], leading to a release of dopamine ["DOPE-uh-mean"]. These chemicals play the same role as enkephalins [en-KEFF-uh-linz]; they are both classified as neuro·hormones. These naturally-produced chemicals reduce pain and increase euphoria, much like opioids. Name these chemicals whose release is often mentioned in claims of pseudo·scientific healers and which is credited for "runner's high".

Answer: **endorphin**s [or **dynorphin**s]

18. As a U.S. senator, this person worked with Representative Augustus Hawkins to create the Full Employment and Balanced Growth Act. Before President Kennedy was elected, this person introduced a bill to create the Peace Corps; after Kennedy's death, this person, as Majority Whip, got the Civil Rights Act of 1964 through the Senate. Early in his career, this person led the Fusion Committee that created the Minnesota Democratic-Farmer-Labor Party. Name this person who served as Lyndon Johnson's vice president and was the Democratic presidential nominee in 1968, when he lost to Richard Nixon.

Answer: Hubert (Horatio) **Humphrey** (Jr.)

19. The theorem named for this concept states that if f is a smooth function whose derivative at some point a is not 0, then this concept can be applied to f around a, and the result of this concept is based on the reciprocal of the derivative. If this concept is applied to a function twice, the result is the original function. The "arc" trig functions are the result of applying this concept to the trig functions, and logarithmic functions are the result of applying this concept to exponential functions. This concept is denoted with a superscript "-1". Name this concept of "undoing" a function.

Answer: **inverse** functions or function **inverse**s or **inverse**s of a function or **inversion** or **invert**ing

20. In a 1644 book, this person wrote "God requireth not a uniformity of religion to be enacted and enforced in any civil state." That opinion, and this person's belief that American colonies should have been purchased from Native Americans, caused him to be exiled. This author of *The Bloudy* ["bloody"] *Tenent of Persecution for Cause of Conscience* eventually got a charter for land he purchased from the Narragansetts [nair-uh-GAN-sets]. Some of the people who moved to this person's colony were Anti·nomians who supported Anne Hutchinson. Name this founder of Rhode Island.

Answer: Roger **Williams**

21. A conic section named for this number of points is generated by the diagonal points and midpoints of a complete quadrangle. To calculate log tables, John Napier used a decimal number that consisted of this digit repeated seven times after the decimal. Each rod used in Napier's bones has this many sections. 10 raised to any positive power is equivalent to 1, mod this number. A polygon with this many sides has interior angles that measure 140 degrees and central angles that measure 40 degrees. This number is the only single-digit composite odd number, and it is also a perfect square. Name this largest digit in the decimal system.

Answer: **9**

2020 Reinstein Set – Packet 10
Bonuses

1. This musical is based on George Bernard Shaw's play *Pygmalion* ["pig-MALE"-ee-un].
A. Name this musical about a bet between Colonel Pickering and Professor Higgins over whether they can pass off Eliza Doolittle as a woman of high society.
Answer: ___*My Fair Lady*___
B. *My Fair Lady* was one of several collaborations between this composer and the lyricist Alan Jay Lerner.
Answer: Frederick **Loewe** [loh]
C. In the second act of *My Fair Lady*, Eliza's father Alfred decides to get married and sings this song, including the line "Ding dong! / the bells are gonna chime."
Answer: **"Get Me to the Church on Time"**

2. This organ is the main part of the integumentary [in-TEG-yoo-MEN-tuh-ree] system.
A. Give the common name of this organ that contains the epidermis, dermis, and subcutis [sub-"CUTE"-iss].
Answer: **skin**
B. These glands in the skin tend to be near hair follicles and release an oily substance.
Answer: **sebaceous** [seh-BAY-shuss] glands
C. These muscles attached to hair follicles can cause the hair to stand on end.
Answer: **arrector pili** muscles [prompt on partial answer]

3. This president increased the size of the United States by agreeing to the Gadsden Purchase, which was named after his ambassador to Mexico.
A. Name this president who became unpopular after signing the Kansas-Nebraska Act. The Democrats nominated James Buchanan in 1856 instead of re-nominating this President.
Answer: Franklin **Pierce**
B. This person, who served as Pierce's secretary of war, later became the president of the Confederate States.
Answer: Jefferson (Finis) **Davis**
C. The Pierce administration was weakened by the publication of this document that said the U.S. should buy Cuba or take it over by force.
Answer: **Ostend Manifesto** [or **Ostend Circular**]

4. In this story, John Anderton kills Leopold Kaplan.

A. Name this story in which Anderton is the head of the Precrime Division.

Answer: "The **Minority Report**"

B. "The Minority Report" is by this author of *Do Androids Dream of Electric Sheep?* and "We Can Remember It for You Wholesale".

Answer: Philip K. **Dick**

C. Philip K. Dick's novel *The Man in the High Castle* is mainly set in this city, where Bob Childan owns an antique shop.

Answer: **San Francisco**, California

5. There are six of these elementary particles, including the three neutrinos.

A. Name this class of particles, one of which is the electron.

Answer: **lepton**s

B. Neutrinos were first theorized to balance the energy in this type of decay that either produces an electron and an antineutrino [pause] or a positron and a neutrino.

Answer: **beta** decay

C. Parity conservation states that changing the signs of spatial coordinates does not change outcomes. The lack of parity conservation was demonstrated by the Wu experiment, which measured the beta decay of this element.

Answer: **cobalt**-60

6. This character's enemy was Gessler, who ruled Switzerland.

A. Name this archer who, at Gessler's command, shot an apple off of his son's head.

Answer: **William Tell** [accept either; accept **Wilhelm** Tell or **Guillaume** Tell]

B. William Tell is the protagonist of a play by this author, who also wrote the poem "Ode to Joy", which is set to music in Beethoven's ninth symphony.

Answer: (Johann) Friedrich von **Schiller**

C. Friedrich von Schiller also wrote a trilogy about this general of the Thirty Years' War.

Answer: Albrecht von **Wallenstein** [VAHL-en-shteen] or **Waldstein** [VAHLD-shteen]

7. Identify these artists who made famous self-portraits:

A. This Impressionist made *Self-Portrait with a Beret* in 1886 while living in Giverny [zhiv-air-nee].

Answer: (Oscar) Claude **Monet**

B. This American-born Impressionist painted women in many roles, including herself in *Portrait of the Artist.*

Answer: Mary **Cassatt**

C. This artist looks relaxed in *Self-Portrait with a Black Dog* but has his hands in his hair and his eyes opened wide in *The Desperate Man*, which he made in the 1840s.

Answer: Gustave **Courbet** [goo-stahv **koor-bay**]

8. The Weierstrass [VY-ur-shtrahss] function notably lacks this property at every point.

A. Name this function quality sometimes defined as having a unique tangent line to a point on a graph.

Answer: **differentiability** or being **differentiable** [prompt on having a **derivative**]

B. The mean value theorem requires a function to be continuous over an interval including the endpoints, but it only requires a function to be differentiable over this type of interval that does not include the endpoints.

Answer: **open** interval

C. Consider the function "f of x equals the square root of x". What value of x does the mean value theorem guarantee exist in the interval from 1 to 49?

Answer: **16**

9. The first Jacobite rising was in reaction to this event.

A. Name this event that replaced King James II of England with William III and Mary II.

Answer: **Glorious Revolution** [or the **Revolution of 1688** or the **Bloodless Revolution**]

B. Parliament passed several important acts in 1689, including this one stating that James "did endeavour to subvert and extirpate the Protestant religion and the laws and liberties of this kingdom".

Answer: English **Bill of Rights** of 1689

C. A key point in the Glorious Revolution came when this general ended his support of James. This general was married to Sarah Jennings and later won the Battle of Blenheim [BLEN-em] in the War of the Spanish Succession.

Answer: John **Churchill**, Duke of **Marlborough** [accept either underlined name]

10. This phenomenon can be seen in oxygen because di·atomic oxygen and ozone are different compounds.

A. Name this phenomenon in which a single element makes more than one compound.

Answer: **allotropy** [AL-oh-troh-pee] [or **allotrope**s or **allotropism**]

B. This element, the most common element in semiconductors, can exist as a crystal or amorphous solid.

Answer: **silicon** [accept **Si**]

C. This element has some alloys that expand when they solidify. This element also has an explosive allotrope that changes and releases heat when it is scratched.

Answer: **antimony** [AN-tih-moh-nee] [accept **Sb**]

11. At the end of this story, the protagonist is about to clasp his wife but "feels a stunning blow upon the back of the neck".

A. Name this story about a man who told about an order "declaring that any civilian caught interfering with the railroad, its bridges, tunnels or trains will be summarily hanged".

Answer: "An **Occurrence at Owl Creek Bridge**"

B. In the story, what does the gray-clad soldier—who turns out to be a Federal scout—ask for when he rides up to the protagonist Farquhar's [FAR-kwar'z] gate?

Answer: **drink** of **water** [accept either underlined part]

C. "An Occurrence at Owl Creek Bridge" is in this writer's collection *Tales of Soldiers and Civilians.*

Answer: Ambrose (Gwinnett) **Bierce**

12. Alcoholism commonly damages this organ.

A. Name this organ where cirrhosis [suh-ROH-siss] can occur, meaning that healthy tissue is replaced by scar tissue.

Answer: **liver**

B. This disease is an inflammation of the liver. Type B is usually sexually transmitted.

Answer: **hepatitis** [hep-uh-"TIE"-tiss]

C. Liver disease can be a sign of this genetic disorder that leads to copper poisoning.

Answer: **Wilson**'s disease [or **hepatolenticular degeneration** or progressive **lenticular degeneration**]

13. Warren Buffett said "My wealth has come from a combination of living in America, some lucky genes, and" the compound type of this payment.

A. Give this term for a payment made from a borrower to a lender.

Answer: **interest**

B. This rate is the interest rate that banks charge to lenders who have the best credit ratings.

Answer: **prime** lending rate

C. The prime rate depends on this interest rate, which is what banks charge each other, usually on an overnight basis.

Answer: **fed**eral **funds** rate

14. A triangle can have at most one angle of this type, and if it does have one, then the median to the longest side is less than the circumradius.

A. Name this type of angle that measures between 90 and 180 degrees.

Answer: **obtuse** angle(s)

B. This other type of angle measures between 180 and 360 degrees. A triangle can't have any of them.

Answer: **reflex** angle(s)

C. Consider a triangle with interior angles A, B, and C. What number must "sine A, quantity squared, plus sine B, quantity squared, plus sine C, quantity squared" be less than, if and only if one of the angles is obtuse?

Answer: **2**

15. Answer the following about problems caused by opening things:

A. This first woman of Greek mythology opened a box or jar, releasing evil and sickness to the world.

Answer: **Pandora**

B. Aeolus [ee-OH-luss] gave a favorable wind to this person and put the other winds in a bag. This person's crew opened the bag, causing their ship to go back to where it was.

Answer: **Odysseus** or **Ulysses**

C. The temple of God opens in the Book of Revelation after this many trumpets sound, followed by lightning, an earthquake, and great hail.

Answer: **seven** trumpets

16. In this novel, Severo Del Valle ["VIE"-ay] is a Liberal Party politician and a Mason.

A. Name this novel in which somebody tries to poison Severo, but kills his daughter Rosa the Beautiful instead.

Answer: *The **House of the Spirits*** [or *La **casa de los espíritus***]

B. In *The House of the Spirits*, what does Clara do on her 19th birthday that she had not done in nine years?

Answer: **talk** or **speak** or **say** something

C. This author wrote *The House of the Spirits*. She was born in Peru but is Chilean.

Answer: Isabel **Allende** (Llona) [EE-sah-bel **"eye"-YEN-day**]

17. This law was historically called Bernoulli's theorem, though it is not about fluid dynamics.

A. What law states that when an experiment is repeated many times, the sample mean tends to approach the expected value?

Answer: (strong or weak) law of **large numbers**

B. This inequality is used to prove the weak law of large numbers. In it, a particular probability is said to be less than or equal to the reciprocal of the number of standard deviations squared.

Answer: **Chebyshev**'s [**CHEB-ee-sheff**'z] inequality

C. If 1,000 standard dice are rolled, what is the expected value of the sum of the numbers that come up on top?

Answer: **3,500**

18. This quantity is the rotational analogue of mass.

A. Name this property calculated by adding up mass times the square of the distance from the axis of rotation, for each bit of an object.

Answer: **moment of inertia** [accept **rotational inertia** but do not prompt on "inertia"]

B. The moment of inertia of a solid ball rotating around its center equals this number times the sphere's mass times the square of the sphere's radius.

Answer: **2/5** [or 0**.4**]

C. The calculation of the moment of inertia of two objects rotating at different radii can be found using this quantity, equal to the product of the masses divided by the sum of the masses.

Answer: **reduced** mass

19. Answer these questions about women who served in presidential Cabinets:

A. This first female Cabinet member was Franklin Roosevelt's secretary of labor starting in 1933.

Answer: Frances **Perkins**

B. This woman served as secretary of transportation under Ronald Reagan and secretary of labor under George H. W. Bush. She was also a U.S. senator and head of the American Red Cross.

Answer: (Mary) Elizabeth "Liddy" **Dole**

C. Janet Napolitano and Kirstjen Nielsen were two of the first six leaders of this cabinet-level department.

Answer: Department of **Homeland Security** [accept secretary of **homeland security**; prompt on **DHS**]

20. This poem states "Old age should burn and rave at close of day."

A. Name this poem which closes each stanza with its title or the line "Rage, rage against the dying of the light."

Answer: "**Do not go gentle into that good night**" [must be exact]

B. In the last stanza of the poem, what adjective does the poet use to describe his father's tears?

Answer: "**fierce**"

C. This Welsh poet wrote "Do not go gentle into that good night". He also wrote "And death shall have no dominion".

Answer: Dylan (Marlais) **Thomas**