2023 Reinstein Set – Packet 1

Tossups

1. An attempt to eradicate smallpox in this city in 1904 was halted in response to the Vaccine Revolt. In 1808, when the Portuguese royal family fled from Napoleon, they moved to this city. After 15 years, this city lost its status as the capital of Portugal, and in 1960 it lost its status as the capital of the country it is in. In 2018, this city was the site of a fire that destroyed millions of items in a national museum. Because of the Zika [ZEE-kuh] virus epidemic, some athletes were afraid to compete in this city when it hosted the Olympics in 2016. Name this city that used to be the capital of Brazil.
Answer: **Rio de Janeiro**, Brazil [prompt on **Rio**]

2. One group of these things is Seyfert's [SEE-furt's] Sextet, and some examples of these things with luminous centers are also named for Seyfert. Filaments named after these things can be enormous, such as the Perseus–Pegasus example. One classification system for these things, which uses 'E' followed by a number on one side and 'S' followed by a number on the other side, is the Hubble tuning-fork diagram. The nearest large example of these things outside the one we are in is Andromeda. Name these systems of stars that are classified as elliptical, spiral, or irregular, and which include our own Milky Way.
Answer: **galaxy**/ies

3. The built-in type of this quantity is blamed on the expectations of both consumers and workers. The type of this quantity caused by inputs such as labor and materials is called cost-push, and the Phillips curve explains the demand-pull type. The core type of this quantity is measured by ignoring food and energy. The Fisher equation adds this quantity to the real interest rate to calculate the nominal interest rate. When this quantity is too high, the federal reserve usually increases interest rates to slow down the economy. This quantity is measured by changes in the consumer price index. Name this general increase in prices over time.
Answer: **inflation** rate

4. This quantity has a coefficient of resistance that is positive in pure metals but negative in most insulators. Wien's [veen'z] displacement constant is divided by this quantity to find the peak wavelength for radiance. The Stefan [steh-FAHN]–Boltzmann law states that energy emitted from a surface is proportional to the fourth power of this quantity. The third law of thermodynamics is about entropy at the minimum value of this quantity. This quantity is proportional to the average kinetic energy of molecules. This quantity is multiplied by moles and the ideal gas constant in the ideal gas law. Name this quantity measured in kelvins.
Answer: absolute **temperature**

5. When a barber arranges a situation so that this character is bloodied, a curate and another church official laugh at him. This character is bloodied by the goat-herd after the barber describes this man as "the undoer of injustice, the righter of wrongs, the protector of damsels, the terror of giants, and the winner of battles". Much earlier, the barber joined this character's niece, housekeeper, and priest in burning this man's books of chivalry. This character's horse is Rocinante [roh-see-NAHN-tay], and his squire is Sancho Panza. Name this character from La Mancha who attacks windmills in books by Miguel de Cervantes.
Answer: Don **Quixote** [dohn **kee-HOH-tay**] (de La Mancha) [or Don **Quijote** or **Alonso** Quijano or Alonso **Quijano** or Alonso **Quixada** or Alonso **Quesada** or Alonso **Quexana**]

6. In one song by this composer, death behaves like a field marshal. That song comes after a song in which death convinces a peasant to perform a trepak [truh-PAHK] dance in this composer's *Songs and Dances of Death*. Another piece by this composer begins with high-pitched strings and woodwinds followed by slow brass notes representing demons. That piece was one of the works by this composer that Nikolay Rimsky–Korsakov claimed to have corrected. Maurice Ravel [rah-vell] re-orchestrated this composer's piano suite inspired by paintings by Viktor Hartmann. Name this Russian composer of *Pictures at an Exhibition* and *Night on Bald Mountain*.
Answer: Modest (Petrovich) **Mussorgsky**

7. A siege of a city on this island started in 1648, lasted 21 years, and gained control of the city of Candia. This island was the site of the ancient city of Lato [LAH-toh], which was inhabited by the Dorians. A very early civilization on this island was devastated by a volcanic eruption to its north on the island of Thira [THEE-ruh], which is also known as Santorini. This island is the main site where the scripts Linear A and Linear B have been found. This island's palace of Knossos [NAH-sus] was unearthed by Arthur Evans, and it was built by the Minoan [mih-NOH-un] civilization. Name this island that is now the largest and most populous of the Greek islands.
Answer: **Crete** [or **Kriti**]

8. In one story by this writer, a rich man tells his son "Money is successful every time." The son in this writer's story replies that the woman he loves is going to Europe and "We can't buy one minute of time with money", so the father arranges a traffic jam. In another story by this writer, a boy says "I don't have any fun at home. I hate to go to school. I like to camp out." This writer describes that boy eventually being taken home along with 250 dollars. In another story by this writer, Della sells her hair so she can buy a platinum pocket-watch chain for her husband, Jim. Name this author of "Mammon and the Archer", "The Ransom of Red Chief", and "The Gift of the Magi".
Answer: O. **Henry** [or William Sydney **Porter**]

9. The handling of this substance sometimes includes a jar test to determine the best ways to perform coagulation and flocculation to improve this substance's turbidity. This substance changes hydrogen chloride into hydrochloric acid. The ionic product of this substance is 10 to the −14th power. The freezing and boiling points of this compound were used to define the Celsius scale, putting those points at zero and 100 hundred degrees. Name this "universal solvent", each molecule of which consists of two hydrogen atoms and one oxygen atom.
Answer: **water** [accept **H_2O** before "hydrogen"]

10. After this person was president of the United States, he chaired two commissions that reorganized the Executive Department, leading to the creation of the White House Chief of Staff position. As president, this person signed the Agricultural Marketing Act, which created the Federal Farm Board. This person oversaw the creation of an agency that loaned money to railroads and small banks to prevent closures, the Reconstruction Finance Corporation. A series of homeless encampments were named for this president, who lost re-election in a landslide in 1932. Name this president who was in power during the start of the Great Depression.
Answer: Herbert (Clark) **Hoover** [prompt on **Hooverville**s]

11. In one story by this writer, a woman is told that her mother never loved her even for a minute, and her sister does not like her either. That message is given by a talking monkey who likes to steal names. This writer put that story and its follow-up in the collections *Blind Willow, Sleeping Woman* and *First Person Singular*. In a novel by this writer, one woman's job is to kill men who have committed domestic violence, and she investigates the manuscript of *Air Chrysalis*. That novel by this author is narrated by Tengo, Ushikawa, and Aomame [ah-oh-mah-may]. Name this writer of the novel *1Q84* ["one Q eighty-four"].
Answer: Haruki **Murakami**

12. Some parts of this organ are the scapha [SKAF-uh], helix, and triangular fossa [FAW-suh]. This organ can help dissipate heat, especially in animals with large ones such as caracals [KAIR-uh-kalz] and fennec foxes. A region inside this organ, the bony labyrinth, contains the semi-circular canals and the organ of Corti [KOR-tee], the later of which is inside the cochlea ["COKE"-lee-uh]. This organ is connected to the pharynx ["FAIR-inks"] by the Eustachian [yoo-STAY-shin] tube. This organ has three very small bones called the malleus [MAL-ee-uss], incus, and stapes [STAY-peez], whose names mean "hammer", "anvil", and "stirrup". A common infection of this organ is otitis [oh-"TIE"-tiss] media. Name this organ used for hearing.
Answer: **ear**s

13. In one novel by this author, Tom often says "If this man had not twelve thousand a year, he would be a very stupid fellow" in reference to Mr. Rushworth. In this author's third novel, Rushworth marries Tom's younger sister Maria, who is part of the Bertram family, which takes in but mistreats the protagonist, Fanny Price. Another novel by this author begins with the arrival of Mr. Bingley, who eventually marries Jane, the oldest of five sisters. In that novel, this author described the relationship between Fitzwilliam Darcy and Elizabeth Bennet. Name this author of *Mansfield Park* and *Pride and Prejudice*.
Answer: Jane **Austen**

14. Starting in 2015, a major cleaning of this building took place using bamboo scaffolding and a mud paste called Fuller's earth. The original primary architect of this building also played a major role in designing the Red Fort. Historians disagree as to whether there were plans to build a black building that would be connected to this building by a bridge. Many of the precious stones in this building were stolen by English soldiers in 1857. This building was completed in 1653 to honor the third and favorite wife of Shah Jahan. Name this building in Agra, India.
Answer: **Taj Mahal**

15. A temple in Washington, D.C. features two of these creatures representing the Temple of Solomon pillars Jachin [yah-KEEN] and Boaz. Sculptures of these mythological creatures are believed to have been placed in front of ancient temples to protect the temples. Anybody who could destroy this creature could take over the kingdom led by King Creon [KREE-ahn], and that turnover of power happened when this creature jumped off a mountain. This creature killed itself because Oedipus [ED-uh-puss] gave the answer "Man" in response to this creature's riddle. Name this creature that has a human head and lion's body [pause] and is depicted on a "great" sculpture in Egypt.
Answer: **sphinx**es

16. This TV show is a reboot of the 2003 show that first made Carson Kressley famous. Special episodes of this show have included a show about a Delta Air Lines employee with student debt, four episodes in Japan, and an episode in the town of Yass, Australia. The regulars on this show are Bobby Berk, Antoni Porowski, Tan France, Karamo [kuh-RAH-moh] Brown, and Jonathan Van Ness. One of the episodes of this show focuses on improvements to a church community center in Gay, Georgia. Name this Netflix reality show in which a team of LGBTQ people turn around people's lives.
Answer: ***Queer Eye*** [accept ***Queer Eye*** *for the Straight Guy* or ***Queer Eye****: More than a Makeover*; accept answers that additionally specify the 2018 or current version]

17. Problems with this organelle can cause Diamond–Blackfan anemia. A type of scanning named for these organelles takes place in their smaller subunit. Some of these organelles are attached to the inner mitochondrial ["my"-toe-KON-dree-ul] membrane. The primary purpose of the nucleolus [noo-klee-OH-luss] is to manufacture these organelles. Many of these organelles are attached to the rough endoplasmic reticulum's outer membrane. These organelles are the location where translating mRNA into protein occurs. Name these organelles that are made up largely of their namesake RNA.
Answer: **ribosome**s [accept **Palade granules**]

18. This person wrote the memoir *Quiet Strength*. This person's most famous action was almost identical to what Claudette Colvin had done, but Colvin was less supported because she was unmarried and pregnant. E. D. Nixon and Clifford Durr represented this person, but a similar case involving Aurelia Browder went to the Supreme Court instead of this person's case. This person was arrested on December 1, 1955, and she was supported by Martin Luther King Jr. when he was president of the Montgomery Improvement Association. Name this woman who refused to give up her bus seat to a white passenger.
Answer: Rosa (**McCauley**) **Parks** [accept either underlined name]

19. When this term is used as a verb in statistics, it refers to the methods of restriction, matching, or randomization, all of which are done to address confounding variables. The past participle of this term is used to describe an experiment that uses the method of comparison. In those experiments, an effort is made to have two groups that differ only in one variable so that the effect of that variable can be studied. Give this word that also refers to the group in an experiment that either receives a placebo or goes untreated so that they can be compared to the group that does receive treatment.
Answer: **control** [accept **control**led]

20. This U.S. president supported a mission that captured and then lost the village of Kekionga [kee-kee-AWN-guh] under the leadership of Josiah Harmar [hur-MAR]. After another defeat at the site that is now Fort Recovery, this president forced General Arthur St. Clair to resign. This president's farewell address was first published as a letter in the *American Daily Advertiser*. That address, which said "foreign influence is one of the most baneful foes of republican government", is now spoken by a senator each year. This president was unanimously elected by the Electoral College both times he ran. This president's treasury secretary was Alexander Hamilton. Name this first U.S. president.
Answer: George **Washington**

21. Every other triangular number is in the sequence named for this type of polygon. The Pascal line of this type of polygon exists if the vertices are on a conic section. In the regular polygon of this type, the longest diagonals are twice as long as the sides. Squares, triangles, and the regular polygon of this type are the only regular polygons that, on their own, can tessellate the plane. The regular polygon of this type is broken into equilateral triangles by drawing all of the diagonals through the center. This polygon's central angles each measure 60 degrees. Name this shape that has one more side than a pentagon.
Answer: (regular) **hexagon**s

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Bonuses

1. Leontyne Price and Maria Callas are singers in this voice range.

A. Name this common female voice range whose lowest note is typically around middle C.

Answer: **soprano**

B. Leontyne Price was best known for performing as this title character who sings "O Patria Mia". Radamès [rah-dah-MAYSS] falls in love with this enslaved Ethiopian princess.

Answer: **Aida** [**"eye"-EE-dah**]

C. The first season of the Lyric Opera of Chicago featured Maria Callas in this title role. This title character of an opera by Vincenzo Bellini sings "Casta Diva".

Answer: **Norma**

2. One of the most obvious examples of this phenomenon is the "photo-" type.

A. Name this orientation of a plant in response to a stimulus, such as when they grow towards light.

Answer: **trop**ism [accept photo**trop**ism or photo**trop**y]

B. Tropism is often explained as a response by these plant hormones that promote cell elongation.

Answer: **auxin**s [**AWK-sin**z]

C. Auxins were discovered by studying these sheaths that protect monocotyledons [MAH-noh-koh-tuh-LEE-dunz].

Answer: **coleoptile**s [**koh-lee-AHP-"tile**s"]

3. Name these compromises from U.S. history:

A. This 1820 compromise admitted Maine as a free state and its namesake state as a slave state.

Answer: **Missouri** Compromise

B. This compromise included the Fugitive Slave Act and the admission of California as a free state.

Answer: Compromise of **1850**

C. This unsuccessful compromise included six proposed constitutional amendments. This compromise was an attempt to avert the Civil War by making slavery permanent.

Answer: **Crittenden** Compromise

4. This poet wrote the autobiographies *The Big Sea* and *I Wonder as I Wander*.

A. Name this poet who asked "What happens to a dream deferred?" in the poem "Harlem".

Answer: (James Mercer) Langston **Hughes**

B. This poem by Hughes states "I bathed in the Euphrates [yoo-FRAY-teez] when dawns were young" before mentioning the Congo, Nile, and Mississippi.

Answer: "The **Negro Speaks of Rivers**"

C. What is the last word in the poem "Harlem"? This word finishes the question beginning "Or does it".

Answer: **explode**?

5. Identify these units of length:

A. This is the SI ["S-I"] base unit of length.

Answer: (1) **meter** [or **meter**s]

B. This unit is 10 to the −10th meters, approximately the size of an atomic radius. This unit is named for a Swedish scientist.

Answer: (1) **angstrom** [or **angstrom**s]

C. This length, named for a scientist, is based on fundamental constants and equal to a little more than 10 to the −35th meters.

Answer: **Planck** length [accept Max (Karl Ernst Ludwig) **Planck**]

6. This character resumes playing the organ after he is told by Professor Pierre Aronnax that there are at least 100 savages nearby.

A. Name this character, identified as Prince Dakkar in *The Mysterious Island*, who designs and captains a submarine.

Answer: Captain **Nemo**

B. Captain Nemo is a character in this author's *Twenty Thousand Leagues Under the Seas*.

Answer: Jules (Gabriel) **Verne** [zhool **vairn**]

C. This commander of the *Abraham Lincoln* in *Twenty Thousand Leagues Under the Seas* shares his name with a real-life naval officer.

Answer: Commander **Farragut**

7. The architect I. M. Pei [pay] used pyramids in some of his designs.

A. Pei designed four pyramids for the courtyard of this art museum in Paris.

Answer: the **Louvre** Palace [accept Palais du **Louvre**]

B. Pei also used a pyramid structure for part of this project on the south shore of Lake Erie.

Answer: **Rock and Roll Hall of Fame** [prompt on **RRHOF** or **Rock Hall**]

C. Pei's original design for the library and museum dedicated to this president was a truncated pyramid.

Answer: John F(itzgerald) **Kennedy** [accept **JFK**]

8. The multiplicative version of this concept is the same thing as the reciprocal.

A. Name this concept. The additive version is found by multiplying the original number by -1.

Answer: **inverse**

B. Find the multiplicative inverse of 2 minus the square root of 3. Express your answer without using any fractions.

Answer: **2 plus** the square **root** of **3** [or the square **root** of **3 plus 2**; accept **2 plus radical 3** or **radical 3 plus 2**]

C. This term is given to the result of a number being cancelled by its inverse. For reals, one is the multiplicative type, and zero is the additive type.

Answer: **identity** element [accept **identities**]

9. After Nikita Khrushchev [KROOSH-cheff] denounced Stalinism, this person had his country denounce the Soviet Union.

A. Name this leader of the People's Republic of China. He was the Chairman of the Communist Party of China until his death in 1976.

Answer: (Chairman) **Mao** Zedong [or **Mao** Tse-tung; prompt on **Zedong** or **Tse-tung**]

B. For the last 10 years of his life, Mao oversaw this movement whose goal was to remove capitalist and traditional elements.

Answer: (Great Proletarian) **Cultural Revolution** [accept (Wuchanjieji) **wenhua geming**]

C. This person became the premier of China from 1976 to 1980 and chairman of the Chinese Communist Party from 1976 to 1981. He arrested the Gang of Four and allowed the restoration of Deng Xiaoping [dung shao-ping].

Answer: **Hua** Guofeng [prompt on **Guofeng**; accept **Su** Zhu]

10. Confusingly, this process involves a gain in electrons.

A. Name this process that generally occurs at the same time that another atom undergoes oxidation.

Answer: **reduction** [or **reducing**; accept **reduce**(s) or **reduce**(d); do not accept "redox"]

B. Give the name often used for elements in group 2 of the periodic table, which include beryllium [buh-RILL-ee-um] and generally can be used as reducing agents.

Answer: **alkaline earth** metals [do not accept or prompt on "alkali"]

C. This class of compounds that consist of a metal with a negative hydrogen ion are also used as reducing agents.

Answer: metal **hydride**s [**"HIDE-ride**s"]

11. The introduction to this poem says "The Pool Players. Seven at the Golden Shovel."

A. Name this poem that states, "We / Left school. We / Lurk late. We / Strike straight. We / Sing sin. We / Thin gin. We / Jazz June. We / Die soon."

Answer: "**We Real Cool**"

B. This Black writer, who was the Poet Laureate of Illinois from 1968 to 2000, wrote "We Real Cool".

Answer: Gwendolyn (Elizabeth) **Brooks**

C. Gwendolyn Brooks also wrote this poem about an "old yellow pair" "who are Mostly Good".

Answer: "The **Bean Eaters**"

12. This region consists primarily of iron and nickel.

A. Name this region in the middle of the Earth that has inner and outer layers.

Answer: (Earth's) **core**

B. These seismic waves can travel through the Earth's core. Give a one-letter answer.

Answer: **P**-waves

C. The lower mantle near the core has rocks very similar to this rock. The prototype of this rock is calcium titanate ["titan-ate"], but the rocks near the core are made of magnesium silicate [SIL-uh-kut] in a similar crystal form.

Answer: post-**perovskite** [**peh-RAWVS-"kite"**]

13. Many world leaders attended the annual Climate Change Conference in November 2022 in Egypt.

A. This organization, which has a Security Council and General Assembly, organized the conference.

Answer: **United Nations** [accept **UN**]

B. Kristalina Georgieva [kree-stah-LEE-nuh gorg-YEV-uh], the leader of this organization, called for higher carbon prices. This organization was created along with the World Bank in 1944 to increase monetary cooperation.

Answer: **International Monetary Fund** [accept **IMF**]

C. An agreement to create this fund was made at the conference. This fund, whose name is two English words separated by the word "and", forces wealthy nations to pay for environmental problems in developing nations.

Answer: **loss** and **damage** fund

14. In this type of sequence, the difference between any two consecutive terms is always the same.

A. Name this type of sequence formed by repeatedly adding the same number to each term to get the next term.

Answer: **arithmetic** [**air-ith-MET-ik**] sequence [or **arithmetic** progression]

B. Find the 21st term of the arithmetic sequence that begins 47, 49, 51, et cetera.

Answer: **87**

C. Find the sum of the first 200 positive integers.

Answer: **20,100**

15. Dorine tells this character that Elmire wants to talk to him, and he later tries to seduce Elmire.

A. Name this character who tries to get Orgon arrested and gain Orgon's possessions.

Answer: **Tartuffe** [**tar-toof**]

B. Tartuffe is the title character in a play by this French writer who also wrote *The Misanthrope*.

Answer: **Molière** [mawl-yair] [or Jean-Baptiste **Poquelin**]

C. A lost play by Molière is titled for a person with this job being *in Love*. In another play by Molière, two servants force a woodcutter to claim he has this job; that play is titled for somebody having this job *in Spite of Himself*.

Answer: **doctor** [accept **physician** or **médecin**]

16. Answer these questions about Moses:

A. Whose bones did Moses take out of Egypt because of a promise made by the sons of Israel?

Answer: **Joseph**'s bones [or **Yosef**]

B. What man, the father-in-law of Moses, suggested that Moses appoint judges instead of judging every case himself?

Answer: **Jethro** [or **Yitro**]

C. Moses was tending to Jethro's flock when he saw an angel and heard from the Lord on Mount Horeb. The Lord spoke from what object, which burned but was not consumed by the fire?

Answer: burning **bush** [accept **seneh** or **bramble**s]

17. Wilson's theorem is usually expressed using this type of arithmetic.

A. Name this type of arithmetic in which two numbers are considered equivalent if they have the same remainder when divided by the same fixed number.

Answer: **modular** arithmetic [prompt on **mod**ulus or **mod**ulo]

B. Which theorem states that "a to the p power" is congruent to a, mod p, for every prime number p?

Answer: **Fermat**'s [**fair-mah**'z] **little** theorem [prompt on partial answer]

C. What one-digit positive number is congruent to -12, mod 10?

Answer: **8**

18. This particle was first observed in 2012 at the Large Hadron [HAY-dron] Collider.

A. Name this fundamental particle whose mass has been used to calculate the mass of W and Z bosons [BOH-zahnz].

Answer: **Higgs** boson [or **Higgs** particle]

B. W and Z bosons mediate this fundamental interaction.

Answer: (electro)**weak** interaction or (electro)**weak** force

C. The Higgs field is this type of field in which every point in space can be assigned a numerical value. Potential and temperature fields are also this type of field.

Answer: **scalar** fields

19. This person was re-elected to the U.S. Senate by the Illinois General Assembly after engaging in seven debates with Abraham Lincoln in 1858.

A. Name this Democrat who then finished fourth in the 1860 Presidential Election.

Answer: Stephen A(rnold) **Douglas**

B. During the debate, Lincoln contrasted this 1854 law drafted by Douglas with the *Dred Scott* decision. This law gave two territories the ability to apply for statehood and determine their own slavery policy.

Answer: **Kansas–Nebraska** Act

C. At the debate in this town, Douglas said "No matter what the decision of the Supreme Court may be on that abstract question, still the right of the people to make a Slave Territory or a Free Territory is perfect and complete under the Nebraska bill."

Answer: **Freeport**, Illinois [accept **Freeport** Doctrine]

20. This poem ends "A mind at peace with all below, a heart whose love is innocent!".

A. Name this poem about a woman who is "like the night of cloudless climes and starry skies."

Answer: "**She Walks in Beauty**"

B. This poet wrote "She Walks in Beauty" as well as the longer works *Don Juan [joo-un]* and *Childe Harold's Pilgrimage*.

Answer: (George **Gordon Noel**,) Lord **Byron** [accept any underlined name]

C. In 1816, which became known as the Year Without a Summer, Byron wrote this poem that begins "I had a dream, which was not all a dream."

Answer: "**Darkness**"