

## 2020 Reinstein Set – Packet 5

### Tossups

1. Like many slave traders, **Tipu** [TIP-oo] Tip also traded this substance. Celluloid was developed as a replacement for this substance. Kenyan president Daniel Arap Moi burned 12 tons of this substance in 1989. During the same year, an international moratorium was established on the trade of this substance. Richard Leakey, the son of Mary and Louis Leakey, organized units that were allowed to shoot people on sight to curtail trade in this substance. This substance used to be popular to make billiard balls and the covering of some piano keys. Name this substance whose trade was banned to save elephants, since this substance comes from elephants' tusks.

Answer: **ivory**

2. A work by this composer features the voice of the Angel of Agony and is based on a poem by Cardinal John Henry Newman. In that work by this composer, an old man—who is the protagonist—ends up in Purgatory. Another song by this composer has a repeated rhythm of a half note, two eighth notes, quarter note, three half notes, two eighth notes, quarter note, dotted half note. Another work by this composer consists of variations dedicated to people he knew, though Augustus **Jaeger** [YAY-gur] is called Nimrod. Name this English composer of *The Dream of Gerontius* and *Enigma Variations* whose *Pomp and Circumstance Marches* are often played at graduations.

Answer: Edward **Elgar**

3. The end of one poem by this writer brags “that I have kept the form and essence of my love in its decomposition”. In that poem—which begins “Darling, do you recall that thing we found?”—this writer describes a decaying carcass near a path. In another poem by this writer, the narrator repeatedly begs “Take pity on my long misery.” That poem, which this writer ended with a prayer stating “Glory and praise to you, O Satan,” is titled “The Litanies of Satan”. Name this French poet who used the section “Spleen and Ideal” to begin his collection *The Flowers of Evil*.

Answer: **Charles Baudelaire** [sharl boh-deh-lair]

4. This goddess was honored by a series of races for women held every four years in the Olympic stadium. This goddess was hung from the clouds with two anvils hanging from her feet. The Milky Way was formed when Hercules tried to nurse from this goddess while she was sleeping, and she pushed him away. This goddess later sent two giant snakes to try to kill Hercules and his twin. **Hephaestus** [huh-FESS-tuss] made a throne for this goddess that did not allow her to stand up. That was in revenge for her throwing him out of Olympus. By some accounts, Hephaestus is the fatherless child of this goddess. This goddess was vengeful towards many women who had affairs with her husband. Name this wife of Zeus.

Answer: **Hera** [prompt on **Juno**]

5. There are different ways to define the demi-regular type of this structure, while the semi-regular type is defined similarly to **Archimedean** [ark-ih-MEE-dee-un] solids, meaning there are identical **vertices** [VER-tuh-sees] but not all identical polygons. Like **polyhedra** [pah-lee-HEE-druh], these geometric arrangements can be described by a **Schläfli** [SHLAH-flee] symbol. An a-periodic example of this kind of structure, using kites and darts, was developed by Roger Penrose. There are three regular types of these arrangements, using triangles, squares, and hexagons respectively. In these arrangements, there are no overlaps or gaps between shapes. Give this term for shapes covering a plane surface.

Answer: **tessellation**(s) [accept plane **tilings**; accept **tessellated**]

6. This term comes from a Dutch word for “looter” that became a Spanish word for Americans who incited revolution. This procedure cannot be used when Congress grants fast-track authority to the president or when budget reconciliation is invoked. According to a 1975 rule change, 40% support is required to continue this procedure. This procedure can be limited to at most 30 additional hours by a **cloture** [KLOH-chur] vote. This procedure consists of extending debate on a bill in order to delay a vote, and it sometimes prevents a vote from ever occurring. Name this procedure used to prevent a vote in the U.S. Senate.

Answer: **filibuster**(ing)

7. This country underwent a “coup by memorandum” in 1971, and Kenan Evren led a more traditional coup in it in 1980. Much of what is now this country was split up after World War I by the Treaty of **Sèvres** [sev-ruh], but the modern version of this country was created soon afterward by the Treaty of **Lausanne** [loh-ZAHN]. This country’s first prime minister and second president was Ismet **Inönü** [in-uh-NOO], who fought for its independence against several countries, including Greece. This country invaded Cyprus in 1974 and is the only country that recognizes the Republic of Northern Cyprus. Name this country whose founder was Mustafa Kemal Atatürk.

Answer: (Republic of) **Turkey** or **Türkiye** (Cumhuriyeti)

8. One of the rules named for this person states that atoms with high valence and small coordination number do not share edges and faces. Another rule named for this scientist states that crystals have small numbers of shapes; that rule is the rule of parsimony. In addition to five rules on crystal structures, this person developed a scale that uses bond dissociation energies to quantify elements and classify bonds between them. Name this American scientist whose development of an electronegativity scale and opposition to nuclear weapons testing earned him Nobel Prizes in both Chemistry and Peace.

Answer: Linus **Pauling**

9. One novel by this author is set during the same year as the Spithead and Nore mutinies, which this author refers to as the “Great Mutiny”. This author set that novel on board the HMS *Bellipotent*, where the title character is accused of mutiny by John Claggart. Another novel by this writer is set on a ship owned by Bildad and Peleg, who hire the Polynesian harpooner **Queequeg** [KWEE-kweg], who works for the first mate Starbuck. This author started that novel with the sentence “Call me Ishmael.” Name this author of *Billy Budd* who wrote about Captain Ahab in his novel *Moby-Dick*.

Answer: Herman **Melville**

10. The volume amount named after this person is about 10 to the 31st power cubic light years and is usually in the shape of a sphere. The unit of time named for this person is about 14.4 billion years, which is the reciprocal of the constant named for this person. Those values are based on this person’s law, which was theorized from the observation that farther objects have bigger red-shifts. This person is also the namesake of a “tuning-fork diagram” that is used to classify galaxies, and of a space telescope that has been in orbit since 1990. Name this American astronomer whose law is about the expansion of the universe.

Answer: Edwin (Powell) **Hubble**

11. While working for this company, Heard **Baumeister** [BAO-my-stur] and George Laurer developed the first Universal Product Code barcodes. Research by this company is also responsible for LASIK eye surgery and scanning tunneling microscopes. This company's German subsidiary **Dehomag** [deh-HOH-mag] helped the Nazis track their populations using punch cards. This company was given its current name by its long-time leader Thomas Watson, who is the namesake of one of its recent supercomputers. Name this computer company that is nicknamed "Big Blue" and which developed the PC first used to run Microsoft Windows.

Answer: **IBM** or **International Business Machines**

12. The top of one painting by this artist shows a circle of angels whose outfits are alternating white, pink, and green, while the bottom of that painting shows three angels embracing three men. That painting is *The Mystical Nativity*. The top of another painting by this artist depicts a blindfolded Cupid, apparently aiming his arrow at the Three Graces. The right side of that painting depicts **Chloris** [KLOR-iss] and **Zephyrus** [ZEFF-ih-russ], while this artist placed Mercury on the left side. Another painting by this artist depicts a Hora about to put clothes on a goddess, who has just come to shore and is standing in a shell. Name this Florentine painter of *Primavera* and *The Birth of Venus*.

Answer: Sandro **Botticelli** [boh-tee-CHEL-ee] [or Alessandro (di Mariano) **Filipepi**]

13. A very popular textbook about this technology was written by Stuart Russell and Peter Norvig. This technology's name was coined by John McCarthy, who developed the Lisp programming language. Stephen Hawking said that the emergence of this technology could be the "worst event in the history of our civilization". Some people worry that this technology will bring us to a "singularity" at which point humans will lose control of technology. Name this technology in which computers "think" like humans.

Answer: **artificial intelligence** or **AI** [or **machine intelligence** or **artificial general intelligence** or **AGI**]

14. In one novel by this author, the protagonist drinks wine with Sarah's mother instead of going on a date with Sylvia. In that novel by this author, Sarah dies from a lung infection after the protagonist discovers that Sarah had promised to God not to see him again if he survived an explosion. In another novel by this writer, a dentist hides a book about a Christian martyr in an oven, and a priest misses his boat to Vera Cruz. This English author set that novel in Tabasco, Mexico. Name this author of *The End of the Affair* and *The Power and the Glory*.

Answer: (Henry) Graham **Greene**

15. At the World's Columbian Exposition in 1893, this person promoted interest in induction motors via a demonstration using copper in the shape of an egg that stood on its end in a rotating magnetic field. Another device developed by and named for this person can be used to light a fluorescent light bulb that is not plugged in. That device is often used in demonstrations because its discharge looks like lightning. The S.I. unit named after this person is a weber per square meter and is used to measure the strength of a magnetic field. Identify this Serbian-American inventor of a namesake "coil", who worked with Westinghouse Electric to popularize alternating current.

Answer: Nikola **Tesla**

16. This person wrote the books *It Changed My Life* and *The Second Stage*. In 1966, this person and Pauli Murray wrote the "Statement of Purpose" for an organization that this person became the first president of. Another book by this person was inspired by a survey of people who had graduated from Smith College 15 years earlier; that book describes "the problem that has no name". In 1970, this person organized the Women's Strike for Equality. Name this first leader of the National Organization for Women and author of *The Feminine Mystique*.

Answer: Betty **Friedan** [or Betty **Goldstein**]

17. This poet yearns "Oh for boyhood's painless play" in a work about a boy who "hast more than he can buy". This writer began that poem "Blessings on thee, little man." In another poem by this writer, a woman says "Ah me! That I the Judge's bride might be!". In that poem, this person wrote "For of all sad words of tongue or pen, the saddest are these: 'It might have been!'". Another poem by this writer is about a 90-year-old woman who recovered a Union flag in Frederick, Maryland during the Civil War. Name this poet who wrote "The Barefoot Boy", "Maud Muller", and "Barbara Frietchie".

Answer: John Greenleaf **Whittier**

18. One of the elements in this group of the periodic table is commonly used in **diphenyl ethers** [“die”-FEEN-ul EE-thurz] as a fire retardant. Another element in this group was first produced in 2010 and is called **Tennessine** [TEN-uh-seen]. Two elements in this group combine with carbon to create compounds useful as aerosols and refrigerants, but those compounds harmed the ozone layer. Elements in this group are extremely good at attracting electrons, which means that they have the highest electro-negativities. Name these elements such as **bromine** [BROH-meen] and fluorine that are just to the left of the noble gases on the periodic table.

Answer: **halogens** [accept Group **17**]

19. This character asks “Do you think, because I am poor, obscure, plain, and little, I am soulless and heartless?”. When a marriage proposal is made to this character, she says “You play a farce, which I merely laugh at” because the man who proposes to her had said that he will marry Blanche. After that engagement fails, this character rejects a marriage proposal from **St. John** [SIN-jin] Rivers. The first man to propose to this character was still married to Bertha Mason, who lived in his attic. Name this orphan who eventually marries Mr. Rochester and is the title character of a novel by Charlotte **Brontë** [brahn-tay].

Answer: **Jane Eyre** [accept either]

20. When the cells around these things are dumbbell-shaped, these things are called “**gramineous**” [gruh-MIN-ee-uss]. Other surroundings can cause these objects to be classified as **anomocytic** [ay-noh-moh-SIT-ik] or **anisocytic** [an-“EYE”-soh-sit-ik]. In addition to their immediate surroundings, these things are separated by pavement cells, subsidiary cells, and **trichomes** [TRY-kohmz]. The two cells around each of these things fill with water when conditions are not hot or dry, making these things open; those special **parenchyma** [pair-en-KY-muh] cells around these things are guard cells. These things also get larger when there is less carbon dioxide than normal. Name these microscopic openings on the surfaces of leaves.

Answer: **stomata** [accept **stomas** or **stomates**; prompt on **holes** or **pores** or **leafs** or **guard cells**]

21. For an **osculating** [AHSS-“cue”-lay-ting] circle, this property is the reciprocal of the curvature. When using the method of cylindrical shells, the integral is taken with respect to this quantity. The product of the side lengths of a triangle divided by 4 times the area [pause] gives this property of the triangle’s circum-circle. The area of a sector equals 1/2 times this quantity squared times the central angle.  $4/3 \pi$  is multiplied by this quantity cubed to calculate the volume of a sphere. Name this quantity which is multiplied by  $2 \pi$  to find the circumference of a circle.

Answer: **radius** [prompt on ***r***]

## 2020 Reinstein Set – Packet 5

### Bonuses

1. This person was born in Trier, Prussia, but he left in 1843 because the newspaper he edited was repeatedly censored.

A. Name this writer of *Das Kapital* [dahss kah-pee-TAHL], who worked with Friedrich Engels [“angles”] on *The Communist Manifesto*.

Answer: Karl Marx

B. Marx wrote a detailed criticism of this philosopher’s text *Elements of the Philosophy of Right*. Marx is credited with applying this philosopher’s dialectic to materialism.

Answer: G(eorg) W(ilhelm) F(riedrich) Hegel [HAY-gull]

C. Marx was supportive of the commune that ran this city for a few months during 1871 and which burned down the Tuileries [twee-luh-ree] Palace.

Answer: Paris, France [accept Paris Commune]

2. Enriching this element means increasing its 235 isotope.

A. Name this element used in Little Boy, the first nuclear weapon used in war. Plutonium was used in Fat Man.

Answer: uranium [accept U]

B. The enriching of uranium takes place using diffusion and one of these objects that spins, causing a separation based on density.

Answer: (gas) centrifuges [SEN-trih-fyooj-iz]

C. The mineral uraninite [yoo-RAN-uh-“night”], in which uranium was first discovered, used to have this name. Marie Curie isolated radium from this material.

Answer: pitchblende

3. This essay states “So long as you write what you wish to write, that is all that matters; and whether it matters for ages or only for hours, nobody can say.”

A. Name this essay published in 1929 based on two talks on the topic “Women and Fiction”.

Answer: “A Room of One’s Own”

B. This author of *To the Lighthouse* wrote “A Room of One’s Own”.

Answer: Virginia (Adeline Stephen) Woolf [accept either underlined name]

C. The essay states that a woman needs two things to write fiction: a room of her own and what else?

Answer: money [accept any reasonable answer conveying that idea]

4. Some translations of First Corinthians refer to “faith, hope, and love”, while other translations refer to “faith, hope, and” *this* concept.

A. Name this concept common in many religions. Jews call it tzedakah and Muslims call it *zakat*.

Answer: **charity** [accept **charitable** giving or **donations**; do not accept or mention “tithing” or “tithe”]

B. This term refers to the practice supported by several religions of giving one-tenth of a person’s income to charity.

Answer: **tithing** or **tithe**(s)

C. Some charities in India support these buildings near temples that provide rooms and sometimes food.

Answer: **choultry** or **chatram** or **satram** or **dharmasala**

5. This period lasted from about 1946 to 1990.

A. Name this time during which there was tension between the United States and Soviet Union, but no full-scale fighting between them.

Answer: **Cold War**

B. This agreement—officially called the Treaty of Friendship, Cooperation and Mutual Assistance—was signed by the Soviet Union and its allies in 1955 after West Germany joined NATO.

Answer: **Warsaw Pact**

C. This American diplomat supported a policy of containment towards the Soviet Union with his “Long Telegram” and his anonymous article *The Sources of Soviet Conduct*.

Answer: George (Frost) **Kennan**

6. This short story describes an event that starts around 10 a.m. so participants can get home for noon dinner.

A. Name this story in which Tessie Hutchinson gets a slip of paper with a black mark on it.

Answer: “The **Lottery**”

B. In “The Lottery”, Mr. Summers runs this type of business. The lottery box is stored in his safe.

Answer: **coal** company [accept **coal** business; do not accept putatively related answers like “mining”]

C. This author wrote “The Lottery”. She also wrote *The Haunting of Hill House*.

Answer: Shirley (Hardie) **Jackson**

7. In 1084, Robert **Guiscard** [gwee-kar] attacked this city to free Pope Gregory VII from the Castel Sant'Angelo.

A. Name this city surrounding Vatican City that has been sacked several times, including in 410 by the Visigoths and in 546 by the Ostrogoths.

Answer: **Rome**, Italy [or **Roma**, Italia]

B. This group led by **Genseric** [JEN-suh-rik] sacked Rome in 455. This group's name is now applied to people who purposely destroy property.

Answer: **Vandals**

C. In the book *Ab Urbe Condita* [ahb UR-bay kon-DEE-tuh], this historian described a sack of Rome in 387 BCE by the Gauls under Brennus. The description is not believed to be accurate.

Answer: **Livy** [or Titus **Livius**]

8. In George Bernard Shaw's play *Man and Superman*, John Tanner dreams about this character in Hell.

A. Name this womanizer who is the subject of many works of fiction by many writers, including Thomas Shadwell's play *The Libertine* [LIB-ur-teen].

Answer: Don **Juan** [wahn]

B. In his poem *Don Juan*, this English poet said the title character was "sent to the devil somewhat 'ere his time". This poet also wrote "She Walks in Beauty".

Answer: (George Gordon Byron), Lord **Byron**(, 6th Baron Byron)

C. In the initial legend and in Lord Byron's poem, Don Juan is from this city.

Answer: **Seville**, Andalusia, Spain [or **Sevilla**]

9. All but two of the faces of this type of solid need to be parallelograms and are usually rectangles.

A. Name this type of solid with two parallel bases that are congruent polygons.

Answer: **prism**(s)

B. Find the volume of a triangular prism if each of its edges is two units long.

Answer: **2** times the square **root** of **3** (cubic units) [accept **2** times **radical 3** (cubic units); do not prompt on partial answers]

C. Find the total surface area of a rectangular prism if it has edges of length 1 unit, 2 units, and 3 units.

Answer: **22** square units

10. The northeast corner of this country contains a part of Lagoon Mirim, which is mostly in Brazil.

A. Name this country whose capital is **Montevideo** [mohn-tay-vee-DAY-oh].

Answer: (Oriental Republic of) **Uruguay** [or (República Oriental del) **Uruguay**]

B. The combination of the Uruguay and the Paraná Rivers forms this waterway south of Uruguay.

Answer: Río de la **Plata** [or La **Plata** River]

C. This river flows across Uruguay. It is dammed to form the **Rincón del Bonete** [reen-KOHN del boh-NAY-tay] Reservoir.

Answer: Río **Negro** [NAY-groh] or **Negro** River [prompt on **Black** River]

11. This composer's younger brother Michael wrote 43 symphonies, but this composer wrote even more.

A. Name this Austrian composer of 106 symphonies, including the *Surprise* symphony.

Answer: (Franz) Joseph **Haydn** ["HIDE-in"]

B. Haydn's symphonies numbered 93 through 104 are collectively named for, and mostly written in, this city. He wrote them later than his Paris Symphonies.

Answer: **London**, England [accept **London** Symphonies]

C. Haydn's 103rd symphony is given this nickname due to its opening.

Answer: The **Drumroll**

12. All cells have these structures; some also have a cell wall.

A. Name this structure that separates the cell interior from the world outside the cell.

Answer: cell **membrane** [or plasma **membrane** or cytoplasmic **membrane**]

B. Much of the cell membrane comprises this "bilayer".

Answer: phospho**lipid** bilayer

C. This term refers to proteins that are embedded in the phospholipid bilayer.

Answer: **integral** membrane proteins [or **IMPs** or **intrinsic** proteins]

**13.** The 1917 Nobel Prize in Literature was shared by Karl Adolph Gjellerup [GEH-luh-roop] and Henrik Pontoppidan [pahn-TAH-pee-dahn].

A. They were both from this country, and were part of the Modern Breakthrough movement.

Answer: (Kingdom of) **Denmark** or (Kongeriget) **Danmark**

B. Denmark was also the home of this children's author who wrote "The Little Mermaid" and "The Ugly Duckling".

Answer: Hans Christian **Andersen**

C. This is the pen name of the Danish author Karen Blixen, who wrote *Out of Africa* about her time in Kenya.

Answer: Isak **Dinesen**

**14.** This artery ascends as it leaves the left ventricle of the heart.

A. Name this largest artery in the human body.

Answer: **aorta**

B. The aorta goes through an opening in this muscle to get from the thoracic [thor-ASS-ik] cavity to the abdominal cavity.

Answer: **diaphragm**

C. The aorta then splits to form these arteries, one on each side, that go towards the pelvis and legs. Give a single answer.

Answer: (common) **iliac** arteries

**15.** Propositions 16 and 32 in Euclid's *Elements* are theorems involving this type of angle.

A. Name this type of angle between the extension of one side of a polygon outside of the polygon [pause] and the side adjacent to the extended side.

Answer: **external** angle(s) or **exterior** angle(s)

B. Find the measure, in degrees, of an external angle in a quadrilateral if the three other external angles each measure 100 degrees.

Answer: **60** degrees

C. Find the measure, in degrees, of each external angle of a regular dodecagon [doe-DEH-kuh-gon].

Answer: **30** degrees

16. The conventional form of this phenomenon can be explained by BCS theory.

A. Name this phenomenon in which a material exhibits no electrical resistance.

Answer: **superconductors** or **superconductivity** or **superconducting**

B. When two electrons are bound together in conventional superconductivity, they are known by this term.

Answer: **Cooper pair**

C. This quantity is the maximum vibrational frequency in a lattice. It is used to find the energy gap that separates Cooper pairs from electrons.

Answer: **Debye** [duh-BY] frequency

17. The Second Bank of the United States was given a charter from 1816 to 1836. When that time ended, it briefly became private before folding.

A. In 1832, this president vetoed the bill to re-charter the bank.

Answer: Andrew **Jackson**

B. The Second Bank of the U.S. was supported by this 1819 Supreme Court decision that protected the bank from a state tax.

Answer: **McCulloch v. Maryland** [prompt on **Maryland**]

C. The combination of the bank going private and this Jackson executive order are blamed for the Panic of 1837. This executive order required public lands to be paid for with gold or silver.

Answer: **Specie Circular**

18. The **gestational** [jess-TAY-shun-ul] form of this disease can cause newborn babies to be larger than usual.

A. Name this class of diseases characterized by high blood sugar levels.

Answer: **diabetes** mellitus

B. Diabetes is often caused by damage to these cells in the pancreas that synthesize insulin.

Answer: **beta** cells

C. Beta cells also release **amylin** [AM-uh-lin] and this peptide that can be used to bind insulin. Levels of this **peptide** ["PEP-tide"] can differentiate between types of diabetes.

Answer: **C-peptide** [or **connecting** peptide]

19. A museum formerly called the National Museum of American Art now has a name that makes its association with this institution obvious.

A. Name this institution that oversees several museums, many of which are on the National Mall in Washington, D.C. Its largest museum is the National Air and Space Museum.

Answer: **Smithsonian** Institution

B. This artist's *Only One* is at the Smithsonian American Art Museum. It is one of her works inspired by the perspective of riding an airplane, such as *Sky Above the Clouds*.

Answer: Georgia (Totto) **O'Keeffe**

C. The Smithsonian American Art Museum shares a building with this other part of the Smithsonian Institution that displays works by Gilbert Stuart and Shepard Fairey.

Answer: **National Portrait Gallery**

20. For a logarithmic function, this set is usually the positive real numbers.

A. Give this term for the set of possible values of the input variable to a function. It is often contrasted with the range.

Answer: **domain** [do not accept or prompt on "codomain"]

B. For this type of function, each element of the domain corresponds to a different element of the range. Functions with this property do not need to be surjective, but they can be.

Answer: **one-to-one** or **injective** function or **injection**

C. Find the smallest positive value, in radians, that cannot be in the domain of the function " $f$  of  $x$  equals 2 plus the tangent of the quantity  $5x$ ".

Answer: **pi/10** or **1/10 pi** [do not accept or prompt on partial answers]