

2022 Reinstein Set – Packet 7

Tossups

1. This leader's early policies, passed with the support of his advisor Sextus **Afranius** [af-RAH-nee-uss] Burrus, included banning capital punishment and allowing slaves to sue their masters. The poet **Lucan** [LOO-kun] joined a conspiracy against this ruler which was called the **Pisonian** [pih-SOH-nee-un] conspiracy. This leader's mother **Agrippina** [a-grih-PEE-nuh] the Younger was initially his regent, but he eventually had her assassinated. This last ruler of the Julio-Claudian dynasty succeeded Claudius. Name this Roman emperor from 54 to 68 who, during the Great Fire of 64, supposedly fiddled.

Answer: **Nero** (Claudius Caesar Augustus Germanicus) [do not prompt on other parts of the name]

2. One poem by this writer ends "O, rest ye, brother mariners, we will not wander more." This poet said of those mariners, "Branches they bore of that enchanted stem." This poet based that poem on both a trip to Spain and a group of people described in Homer's *Odyssey*. In another poem, this person said of a different group, "Theirs not to reason why, theirs but to do and die." This poet memorialized those people who rode "into the valley of Death". Name this English poet who wrote "The Lotos-Eaters" and was inspired by 600 soldiers during the Crimean War to write "The Charge of the Light Brigade".

Answer: (Alfred,) Lord **Tennyson**

3. The only library designed by this architect was completed a few years after his 1969 death, and it was recently modernized to increase the amount of natural light. That library, located in northwest Washington, D.C., is this architect's Martin Luther King Jr. Memorial Library. For a 38-story building in midtown Manhattan, this architect designed most of the building, but two large restaurants inside it were designed by Philip Johnson. This designer of the Seagram Building was also the last director of the **Bauhaus** [rhymes with "cow house"]. Name this German architect who often said "Less is more."

Answer: Ludwig **Mies** van der Rohe [prompt on van der **Rohe**]

4. In most mammals, this gland has three lobes, but in humans the intermediate lobe is just a layer of cells. This gland's **lactotropic** [lak-toh-TROH-pik] cells release **prolactin** ["pro-LACK-tin"]. Some hormones are released by this gland but not created in it, such as the ones that encourage uterus contractions and increase blood pressure, which are **oxytocin** [ahk-see-TOH-sin] and **vasopressin** [vay-soh-PRESS-in]. This gland's **somatotropic** [soh-MAT-oh-TROH-pik] cells release growth hormone in response to signals from the **hypothalamus** ["hype"-oh-THAL-uh-muss]. Name this gland below the hypothalamus and in front of the **pineal** [py-NEE-ull] gland, near the brain.

Answer: **pituitary** [pih-TOO-ih-tair-ee] gland [or **hypophysis**]

5. This program was supported by the slogan "Going all out, aiming high and achieving greater, faster, better, and more economical results". Before it started, the person who oversaw this program said his country would overtake Britain in economic production in 15 years. This program started with a focus on conserving water before moving to a massive collectivization. Because of bad incentives, furnaces were used to melt farm equipment into steel. This program led to massive famines that killed millions of people during the early 1960s. Name this second Five-Year Plan that was overseen by Mao Zedong.

Answer: **Great Leap Forward** [or **Dayuejin**; prompt on second **Five-Year Plan** before "second"]

6. Before Bob Novak was told, this reporter learned from Richard Armitage that Joe Wilson's wife Valerie **Plame** [rhymes with "flame"] worked for the CIA. This writer reported that John Dowd told President Trump "It's either that or an orange jumpsuit" to discourage an interview with Robert Mueller. That book by this journalist was *Fear: Trump in the White House*. This journalist's book *The Secret Man* described his conversations with Mark Felt. Robert Redford, who played this person in a movie, convinced him to focus on himself and his colleagues when co-writing *All the President's Men*. Name this person who worked with Carl Bernstein to investigate Watergate.

Answer: (Robert Upshur) "Bob" **Woodward**

7. The female lead in this play states “If I be waspish, best beware my sting.” When the male lead of this play later says “Sunday is the wedding-day”, the female lead replies “I’ll see thee hanged on Sunday first.” The lead couple in this play does get married, but the man shows up late wearing inappropriate clothes, and during the ceremony he knocks over the priest. Near the end of this play, the husband wins a bet by demonstrating that he has the most obedient wife. Name this play about **Petruchio** [peh-TROO-kee-oh] and **Katherina** [kath-uh-REE-nuh], written by William Shakespeare.

Answer: *The Taming of the Shrew*

8. This element combines with sodium and aluminum to form **cryolite** [“CRY-oh-light”]. The 1906 Nobel Prize for Chemistry was given to **Henri Moissan** [awn-ree mwah-sawn] for isolating this element. The compound known as “hex” consists of six atoms of this element around uranium and is used in uranium enrichment. The acid formed by combining this element with hydrogen is harmful to glass containers and is sometimes used to etch glass. This element was combined with carbon, hydrogen, and chlorine to make **Freon** [FREE-ahn], which was used as a refrigerant until it was discovered to harm the ozone layer. Name this lightest halogen that has a very high electronegativity.

Answer: **fluorine** [accept **F**]

9. In the middle of the last act of an opera by this composer, Wolfram sings “O thou my fair evening star.” At the end of that opera, this composer portrayed the death of the title character after he sees the dead body of Princess Elisabeth. Another opera by this composer ends with a character freeing ravens and riding her horse into a fire. That Immolation Scene shows the death of **Brünnhilde** [broon-HEEL-duh] at the end of **Götterdämmerung** [GUH-tur-DAH-mer-oonk]. A related opera by this composer begins with the “Ride of the Valkyries”. Name this composer of **Tannhäuser** [TAHN-hoy-zur] and a series of four operas called the *Ring* Cycle.

Answer: **Richard Wagner** [reek-hart VAHG-nur]

10. Power plants that collect this type of energy are classified as binary cycle, flash cycle, or dry steam. This renewable energy source is more constant than other sources, though its initial costs have prevented it from becoming more widespread. The best places for power plants that collect this energy are along the Ring of Fire and where the Earth's crust is thin. The primary source of this energy is the natural radioactive decay of potassium, thorium, and uranium, and that energy is often collected by heating water. Ground-source heat pumps collect this type of energy. Name this type of heat energy collected from the Earth.

Answer: **geothermal** energy [prompt on **thermal** energy]

11. In one novel by this author, the protagonist's wife Madeleine leaves him for a man with a wooden leg named Valentine Gersbach. In that novel, this author had the protagonist write, "History, memory—that is what makes us human" in a letter to President Eisenhower that, like many letters in that novel, was never sent. In another novel by this author, Thea Fenchel wants to go to Mexico to train an eagle to hunt lizards. This author ended that novel in France after the protagonist grows up in Chicago. Name this author of *Herzog* and *The Adventures of Augie March*.

Answer: Saul **Bellow** [or Solomon **Bellows**]

12. In S.I. units, electric field strength is given in this unit per meter. To calculate the amount of energy that a capacitor can store in **joules** ["jewels"], multiply one-half times the number of farads times the square of a quantity that is measured in this unit. A measurement in this unit tells the number of joules required to move a **coulomb** [koo-lohm] of charge from one point to another. From that definition, it can be derived that this unit times amperes equals watts, which is a common formula for Joule heating. This unit is equivalent to amperes times ohms, and it is the most common unit of electric potential difference. Name this unit commonly used to measure the strength of a battery.

Answer: **volts** [do not accept "voltage"]

13. The capital of this country contains a statue to the scholar Ibn **Khaldoun** [kahl-DOON] in addition to the Cathedral of St. Vincent de Paul. This country contains a salty lake that is sometimes large called “Chott el **Djerid** [jeh-REED]”, which is near its towns of **Kebili** [keh-BEE-lee] and **Douz** [dooz]. This country contains an ancient amphitheatre in the town of El **Djem** [jam]. The island of **Djerba** [JER-buh] is off the east coast of this country, in the Gulf of **Gabès** [GAH-bess]. This country is the closest African country to Italy. Name this country at the north end of the border between Algeria and Libya, the former site of Carthage.

Answer: (Republic of) **Tunisia** [or (al-Jumhuriyah at-) **Tunisiyah**]

14. This general was put in charge of the troops who had lost at the Battle of **Kasserine** [KASS-uh-reen] Pass, and he led them to win the Battle of El **Guettar** [guh-TAR]. This general then pushed his troops to get to **Messina** [meh-SEE-nuh] as fast as possible because he wanted to get there before the British troops under his ally Bernard Montgomery. During that fighting on Sicily, this general thought some troops in a hospital were cowardly, so he slapped them, which Dwight Eisenhower made him apologize for. This general then led troops into Germany after the Battle of the Bulge. Name this subject of a George C. Scott movie who was nicknamed “Old Blood and Guts”.

Answer: George S(mith) **Patton** (Jr.)

15. At the beginning of a novel by this author, the narrator is given a mop and then hears somebody describe him as “big enough to eat apples off my head”. This author’s narrator thinks that he is cagey because he is half-Indian, though some characters think that the narrator is deaf. This author had that narrator, Chief Bromden, perform a mercy killing on Randle McMurphy after McMurphy’s lobotomy. This author used the money he made from that book to buy a bus called *Furthur* for the Merry Pranksters, which was described in Tom Wolfe’s book *The Electric Kool-Aid Acid Test*. Name this author of *One Flew Over the Cuckoo’s Nest*.

Answer: Ken(neth Elton) **Kesey**

16. This function gives the position of where a ray from the origin intersects the line “ y equals 1”. The range of the inverse of this function is the open interval from zero to pi. This function equals the derivative of the natural log of the sine function. The derivative of this function is the opposite of the square of the co-secant function, so this function decreases over its entire domain. Adding 1 to the square of this function gives the square of the co-secant function. On the unit circle, this function equals x over y . Name this function that, for an acute angle in a right triangle, equals the adjacent side length over the opposite side length.
Answer: **co-tangent** [accept answers that additionally mention a variable; do not prompt on “tan” or “tangent”]

17. A scientific instrument named for this phenomenon is used to study crystal structures, often along with a **Bernal** [BUR-nul] chart. The pattern formed by this phenomenon is the same in some ways whether it is caused by an object or a space according to **Babinet’s** [bab-ee-nay’z] principle. The **Fresnel** [freh-nel] equation describes the near-field type of this phenomenon, and the **Fraunhofer** [FRAUN-hau-fur] equation describes the far-field type. This phenomenon explains why pictures taken with a small aperture are less focused. Many spectrometers use a grating that produces this phenomenon. Name this bending of light when light goes around a barrier or through a hole.
Answer: **diffraction** or **diffracting** or **diffractometer** [do not accept **refraction**]

18. This person was taught music by the same teacher as both **Thamyris** [THAN-uh-riss] and Orpheus. When that teacher, Linus, reprimanded this person, he hit Linus with his lyre, killing him. This person was born after Zeus impersonated **Amphitryon** [am-FIT-ree-un], and this person’s birth name was **Alcaeus** [al-KAY-us]. This person died due to a lie that Nessus told to this person’s wife, **Deianira** [dee-uh-NEE-ruh], who gave him a blood-soaked tunic. This person showed his strength by wearing the skin of the **Nemean** [nih-MEE-un] lion, which he killed before killing the **Lernaean** [ler-NEE-un] Hydra. Name this mythological hero who performed 12 labors.
Answer: **Hercules** or **Heracles** [accept **Alcaeus** before it is mentioned]

19. This person said “May your chains sit lightly upon you, and may posterity forget that you were our countrymen” in an August 1776 speech delivered in Philadelphia. Four years earlier, this person wrote “The Rights of the Colonists”. Thomas Gage exempted John Hancock and this person when Gage offered to pardon people who laid down their arms during the Battles of Lexington and Concord. According to legend, this person said “This meeting can do nothing further to save the country” to start the Boston Tea Party. Name this Massachusetts politician whose cousin became a U.S. president.

Answer: Samuel Adams [prompt on Adams]

20. In one novel by this author, a fictional character has an imaginary son who is in black-and-white and talks to spirits. This author made that fictional character in the mind of spy-novel writer Sam DuChamp, and the character is a modern American version of Don Quixote. In another novel by this writer, the narrator’s sister is a famous singer who is known as the Brass Monkey. This author’s narrator has supernatural powers, and after being switched at birth is raised by a wealthy family in Bombay. Name this author of *Quichotte* [kee-shawt] who wrote about Saleem Sinai [si-NIE] in *Midnight’s Children*.

Answer: (Ahmed) Salman Rushdie

21. Vizing’s [“VIE”-zeeng’z] theorem puts graphs into this many classes. This number is the chromatic number of a graph whose edges correspond to the sides of a polygon with an even number of sides, which is one less than for a polygon with an odd number of sides. If multiplying a prime by this number and adding 1 gives another prime, then the original prime is a *Germain* [zhair-“main”] prime. The sum from zero to k of $1/2$ to the k power equals this number. Identify this number that is the only even prime.

Answer: 2

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Bonuses

1. In this novel, Tom Robinson is accused of raping Mayella Ewell.

A. Name this novel in which Robinson is defended in court by the narrator's father.

Answer: *To Kill a Mockingbird*

B. This author wrote *To Kill a Mockingbird* and *Go Set a Watchman*.

Answer: (Nelle) Harper **Lee**

C. Heck Tate has this job in *To Kill a Mockingbird*. Mr. Tate is a witness at the trial, and after the trial he tells Atticus Finch that Bob Ewell fell on his own knife.

Answer: **sheriff** of Maycomb County

2. This battle was fought in **Embabehe** [em-BAH-bay] and is named for objects that were visible on the horizon during the fighting.

A. Name this 1798 victory in Egypt by Napoleon.

Answer: Battle of the **Pyramids**

B. At the Battle of the Pyramids, the French defeated a remnant of this 13th- through 16th-century sultanate that came from slave soldiers.

Answer: **Mamluks**

C. One month later, Horatio Nelson won this major victory over the French at **Aboukir** [ah-BOO-kir] Bay on the coast of Egypt.

Answer: Battle of the **Nile**

3. This poem states "Now you will not swell the rout of lads that wore their honors out."

A. Name this poem that begins "The time you won your town the race, we chaired you through the market-place."

Answer: "To an Athlete Dying Young"

B. "To an Athlete Dying Young" is in this English poet's collection *A Shropshire Lad*.

Answer: A(lfred) E(dward) **Housman**

C. A. E. Housman also wrote "When I Was One-and-Twenty", whose narrator claims to currently be this age.

Answer: **22** or **two-and-twenty**

4. This constitutional amendment includes the Establishment Clause.

A. Name this amendment stating that Congress can make no law “abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances”.

Answer: 1st Amendment

B. Complete this phrase from the beginning of the 1st Amendment: “Congress shall make no law respecting an establishment of...”

Answer: religion

C. Many Establishment Clause legal cases now are decided based on a test named for this plaintiff in a 1971 Supreme Court case. The test tries to prevent excessive government entanglement with religion.

Answer: Alton (Toussaint) Lemon [accept Lemon test]

5. This quantity can be called amount concentration or substance concentration.

A. Name this measure of concentration equal to moles per liter.

Answer: molarity or molar concentration [do not accept “molality”]

B. This measure of equivalent concentration is always an integer multiple of molarity.

Answer: normality

C. One way to calculate normality is to divide molarity by an equivalence factor that is less than 1. Find the equivalence factor for phosphoric acid.

Answer: 1/3

6. Walter Lippmann said of this U.S. president, “This active inactivity suits the mood and certain of the needs of the country admirably.”

A. Name this president who replaced Warren Harding and then won the election of 1924.

Answer: (John) Calvin Coolidge (Jr.)

B. This secretary of State under Coolidge won a Nobel Peace Prize for working with French foreign minister Aristide Briand [ah-ree-steed bree-awn] to create a treaty renouncing war as a national policy.

Answer: Frank B(illings) Kellogg

C. Coolidge supported this plan that worked out the terms of Germany’s World War I reparations payments.

Answer: Dawes Plan

7. When a fraction's denominator is a complex number, the fraction can be rationalized by multiplying both the numerator and denominator by a number that has this relationship to the denominator.

A. Give this term for a number that has the same real component but opposite imaginary component as another number.

Answer: complex **conjugate** [accept complex **conjugation**]

B. A matrix is called **Hermitian** [**air-MISH-un**] if a combination of conjugation and this other operation does not change the matrix.

Answer: **transposition** or **transpose** [or **transposing**]

C. Find the simplified result when 5 plus $2i$ is multiplied by its conjugate.

Answer: **29**

8. The narrator of this novel often asks "What's it going to be then, eh?".

A. Name this novel that begins with Alex, Pete, Georgie, and Dim drinking what he calls both "milk with knives in it" and "**moloko** [**muh-loh-KOH**] with knives in it".

Answer: *A **Clockwork Orange***

B. This author wrote *A Clockwork Orange* and four novels about Mr. Enderby.

Answer: (John) Anthony **Burgess** (**Wilson**) [accept either underlined name]

C. Anthony Burgess's studies of this other author led Burgess to create *A Shorter Finnegans Wake* and an operetta titled *Blooms of Dublin*.

Answer: James (Augustine Aloysius) **Joyce**

9. Name these stars:

A. This star, sometimes called "Alpha Ursa Minor", has been used for navigation for hundreds of years. It can be located by following a line made by the end of the bowl in the Big Dipper.

Answer: **Polaris** [accept the **North Star** or the **Pole Star**]

B. This star is traditionally called "Alpha Orion" even though **Rigel** [**"RYE"-jul**] is brighter.

Answer: **Betelgeuse** [**"beetle-juice"**]

C. In 1850, this star became the first one other than the Sun to be photographed. It joins Altair and **Deneb** [**DEN-eb**] to form the Summer Triangle.

Answer: **Vega** [or **Alpha Lyra**]

10. This empire ended when Brihadratha [brih-hah-DRAH-tuh] was assassinated in 185 BCE.

A. Name this empire started by Chandragupta [CHAHN-druh-GOOP-tah].

Answer: Mauryan Empire

B. Chandragupta and Bindusara [bin-doo-SAH-rah] Maurya were advised by this person, who might be identical to the person named Kautilya [kau-TEEL-yuh] or Vishnu-gupta who wrote the *Artha-shastra*.

Answer: Chanakya

C. Following Chandragupta and Bindusara, this person ruled for 36 years. Early in his reign, he won the bloody Kalinga [kuh-LEEN-guh] War.

Answer: Ashoka the Great

11. These diagrams are similar to Euler [OY-lur] diagrams.

A. Name these diagrams that typically use overlapping circles to represent sets.

Answer: Venn diagrams

B. How many regions does a Venn diagram have if there are two sets? Include the region that is outside both sets.

Answer: four regions

C. If there are two sets, one of which has 12 elements and another of which has 20 elements, and their union has 25 elements, then how many elements are in their intersection?

Answer: seven elements

12. These compounds contain carbon and a 2-to-1 ratio of hydrogen to oxygen.

A. Name these compounds often found in foods, such as sugar, starch, and cellulose.

Answer: carbohydrates or carbs [prompt on saccharides]

B. Cellulose combines with pectin to form this structure that exists in most living things but not in animals.

Answer: cell walls

C. Though cellulose is usually produced in plants, it is also produced by these invertebrate chordates [“CORE-dates”] that are sometimes called sea squirts.

Answer: tunicates [accept Tunicata]

13. This 15-minute musical piece has been described as a “continuous crescendo”.

A. Name this 1928 composition that begins with snare drums and flutes playing parts that get passed around to the rest of the orchestra.

Answer: **Boléro**

B. This Frenchman wrote *Boléro*. He also wrote the ballet *Daphnis et Chloé*.

Answer: (Joseph-)Maurice **Ravel**

C. This Russian dancer and actress commissioned Maurice Ravel to write *Boléro*.

Answer: Ida (Lvovna) **Rubinstein**

14. Deuterium [doo-TEER-ee-um] and tritium [TRIH-tee-um] have this relationship to hydrogen.

A. Give this general term for atoms that have the same number of protons but different numbers of neutrons.

Answer: **isotopes** [“ICE”-oh-tohps]

B. This element can be turned into a superfluid. One of its isotopes has two different superfluid states, and another isotope has only one superfluid state.

Answer: **helium** [accept **He**]

C. The Girdler process to separate isotopes of hydrogen is named for this ion, which consists of a sulfur atom with a 2-minus charge.

Answer: **sulfide** [do not accept “sulfite” or “sulfate”]

15. This Buddhist concept is similar to the Hindu concept moksha [MOHK-shah].

A. Name this state of perfection that can be achieved when there is no more desire.

Answer: **nirvana**

B. Moksha is the release from this Hindu cycle of death and reincarnation.

Answer: **samsara**

C. Patanjali wrote that samsara is caused by ignorance in his sutras [SOO-truhz] named for this term. This term originally meant “union”, “yoke”, or “harness” in Sanskrit.

Answer: **yoga**

16. This play begins with a watchman seeing a fire that indicates the fall of Troy.

A. Name this play in which Clytemnestra [kly-tem-NESS-truh] kills the title character, who is her husband.

Answer: Agamemnon [ag-uh-MEM-nahn]

B. *Agamemnon* is the first play in this writer's *Oresteia* [or-eh-STY-uh] trilogy.

Answer: Aeschylus [ESS-kuh-luss]

C. *Agamemnon* is followed by *The Libation Bearers*, in which Orestes [or-ESS-teez] kills Clytemnestra and this man whom she marries after the death of Agamemnon.

Answer: Aegisthus [ih-JISS-thuss]

17. This painter often made paintings in series, including one series of Charing Cross Bridge and another on Rouen [roo-en] Cathedral.

A. Name this painter of *Impression: Sunrise* who also made a series of paintings showing haystacks.

Answer: (Oscar-)Claude Monet

B. Many Monet paintings are set in his garden in this village about 50 miles northwest of Paris.

Answer: Giverny [zhee-vair-nee], France

C. Monet painted a series showing this type of tree near the Epte [ep-tuh] River. Just after he finished, the trees became lumber.

Answer: poplar trees or poplars

18. Some textbooks use this term synonymously with “co-domain”, while others use it synonymously with “image”.

A. Give this term for the set of values that a function maps to, in contrast to the domain.

Answer: range

B. Find the largest real number that is not in the range, or image, of the function “ f of x equals 5 raised to the power of the quantity x minus 3”. The domain is all real numbers.

Answer: 0

C. Find the smallest real number that is in the range, or image, of the function “ f of x equals x squared minus $6x$ ”.

Answer: -9 [do not prompt on “9”]

19. This person was praised for his performance at the First Battle of Bull Run despite being on the losing side.

A. Name this general who later burned Atlanta and led the March to the Sea.

Answer: William Tecumseh **Sherman**

B. William Sherman was a brigadier general under Ulysses Grant at this Union victory in Tennessee.

Answer: Battle of **Shiloh** [SHY-loh] [accept **Pittsburg Landing**]

C. This Confederate general died soon after being a pallbearer at Sherman's funeral. Along with P. G. T. Beauregard and Stonewall Jackson, this person led the Confederate Army at the First Battle of Bull Run.

Answer: **Joseph E. Johnston** [prompt on **Johnston**]

20. The Standard Model of physics was worked out during the 1970s to explain three of the four fundamental forces.

A. One confirmation of the Standard Model was the discovery of the top flavor of this particle in 1995. The other five flavors of this particle are up, down, strange, charm, and bottom.

Answer: **quarks**

B. Further confirmation came in 2012 with the discovery of this particle that confers mass to W and Z **bosons** [BOH-zahnz].

Answer: **Higgs** particle(s) or **Higgs** boson(s)

C. The Higgs boson is the only fundamental particle classified as this type of boson. These bosons have zero spin, and alpha particles and **pions** ["PIE"-ahnz] are also this type of boson.

Answer: **scalar** boson