

Teterboro's Academic Packets of Intellectual Rigor  
Packet 5

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**Tossups**

1. **One type of these substances has a red fuming form when mixed with water and dinitrogen tetroxide. A magic form of these substances is often used to stabilize positively charged carbon atoms, and has a value of -23 on the Hammett function. Due to the leveling effect, (\*) hydronium is the strongest of these substances that can exist in water. According to the Bronsted-Lowry definition, these substances are considered proton donors. For 10 points, name these molecules with a low pH in aqueous solutions, examples of which include a hydrochloric type.**

ANSWER: **acid** [accept sulfuric **acid**, Lewis **acid**, magic **acid**, or Bronsted-Lowry **acid**, prompt on electrophile]

2. **One composition of this name begins with a unison C, followed by triplets from G to C. That work's last movement is centered on the four note motif C-D-F-E, and ends with a five voice fugue incorporating other themes from that work. Another work of this name has a theme which was adapted into (\*) "I Vow to Thee, My Country," and is the middle movement of a larger work whose last movement is "the Mystic." For 10 points, name this celestial body which titles Mozart's greatest and last symphony as well as "The Bringer of Jollity" in Gustav Holst's *The Planets*.**

ANSWER: **Jupiter** (accept *Jupiter Symphony* or "**Jupiter**, the Bringer of Jollity")

3. **Lorenzo Dow Baker began the production of this industry, cofounding a company mainly centered in Jamaica. Another company in this industry was granted land for operation by Miguel R Davila, while a larger company in this industry lobbied the US government to launch a coup to overthrow (\*) Jacobo Arbenz. The largest company in this industry was the single largest landowner in Guatemala in the 1930s, while a coup in Honduras sparked by this industry led to the adoption of the US Dollar. For 10 points, name this fruit grown in its namesake exploitative "republics" in Central America.**

ANSWER: **bananas** (prompt on fruit)

4. **One character in this novel gives his son a watch in the hope that it will make him worry less about the passage of time. That character breaks his watch before drowning himself, prompting his brother to remark how students are taught to "swim at night without knowing how to swim" at (\*) Harvard. A mentally handicapped character in this novel associates his sister Caddy with the smell of trees. The second part of this novel is narrated by Quentin, Benjy's brother. For 10 points, name this novel about the Compson family by William Faulkner.**

ANSWER: ***The Sound and the Fury***

5. **One author of this name wrote a book which was critiqued in an essay introducing the term "hysterical realism." Another writer with this name described a theory of human nature based on the teachings of Francis Hutcheson in his work "The Theory of Moral Sentiments," the first work to mention an (\*) "invisible hand." One man with this surname founded the Mormon church while another led the Jamestown colony during the Starving Time. For 10 points, give the surname for the author of the Wealth of Nations.**

ANSWER: **Smith** (accept Zadie **Smith**, Adam **Smith**, Joseph **Smith** and John **Smith**)

6. **In the presence of a non conservative force proportional to velocity, the square of this quantity in an oscillator is reduced by a factor proportional to 1/mass squared. For a simple pendulum, this quantity is equal to the square root of its length over g. Mass times radius times this quantity squared is equal to the (\*) centripetal force. This quantity squared times the moment of inertia is equal to the rotational kinetic energy. For 10 points, name this quantity measured in radians per second, the change in angular position with respect to time.**

ANSWER: angular velocity (do not accept or prompt on velocity or linear velocity)

7. **Although traditionally attributed to this man, most scholars doubt that he actually wrote the Soderini letters. This man sailed alongside Alonso de Ojeda in his second voyage, and mapped several constellations during his fourth voyage under the service of Portugal. In the Mundus Novus, this man informed (\*) Lorenzo de Medici that the land that he discovered was not Asia, but a new landmass. This man mapped out the mouth of the Amazon and explored much of Brazil's coast during his voyages. For 10 points, name this man, for whom the new world continents are named.**

ANSWER: Amerigo Vespucci

8. **Rainfall over a region with large deposits of this substance creates the world's largest reflective surface. A major breeding ground for flamingos is also found in that region in Bolivia. Large amounts of this mineral may also be found in the (\*) Etosha Pan in Namibia. A large sculpture named "Spiral Jetty" juts into a body of water named for this substance. That body of water was formed from the evaporation of Lake Bonneville and sits just northwest of the capital city of Utah. For 10 points, name this substance found in evaporating lakes known as their namesake "flats."**

ANSWER: salt (accept NaCl, Great Salt Lake, Salt Lake City, and Salt Flats)

9. **One author from this country wrote about the photography studio of Styles and a man who pretends to be dead to adopt the identity of someone else. Another character from this country buys fine clothes and has a pen pal named Ethel in the play (\*) *Blood Knot*. Tensions arise from the differences in Morris and Zacariah's skin color in that play set in this country's city of Port Elizabeth, in part due to Morris being able to pass as white and not half black. For 10 points, name this home country of Athol Fugard, whose plays heavily opposed the system of apartheid.**

ANSWER: South Africa

10. **Certain bacteria have been known to perform this process using arsenites as an electron donor. One part of this process can be visualized through the Z scheme and moves electrons to NADP+. In some organisms, this process uses PEP carboxylase to fix carbon in the (\*) CAM and C4 pathways. Another part of this process begins with a five carbon compound forming a six carbon molecule, which is split by the enzyme RuBisCO in the Calvin Cycle. For 10 points, name this process occurring in the chloroplasts of plants which converts sunlight into chemical energy.**

ANSWER: photosynthesis [accept C3 photosynthesis, C4 photosynthesis, or CAM photosynthesis; prompt on Calvin cycle]

11. **An introductory text by this writer asks "What is a poet?" and describes the "anguish in their hearts" and music from their lips. This existentialist used four pseudonyms including Victor Eremita in a work contrasting the aesthetic and ethical ways of life, and names boredom as the root of all evil. A work by this thinker describes the (\*) teleological suspension of the ethical of Abraham by agreeing to kill Isaac in a work that described him as a Knight of Faith instead of a Knight of Infinite Resignation. For 10 points, name this Danish philosopher who wrote *Either/Or* and *Fear and Trembling*.**

ANSWER: Soren Kierkegaard

12. **In one scene in this novel, one character confesses “In vain I have struggled. It will not do.” After that scene, that character gives this novel’s protagonist a letter explaining why he had broken up her sister’s relationship. This novel begins with a wealthy bachelor moving into (\*) Netherfield Park. The protagonist of this novel goes to Pemberley to visit its owner, deepening her affection for him, while her sister Lydia marries George Wickham. For 10 points, name this novel about Fitzwilliam Darcy and Elizabeth Bennet’s relationship by Jane Austen.**

ANSWER: *Pride and Prejudice*

13. **Self adjoint examples of these things are the generators of the Lie Algebra associated with the special unitary group SU(3). These things are equivalent to rank 2 tensors. These things may be factored using LU decomposition. The trace of these things are equal to the sum of their (\*) eigenvalues and the sum of their elements along the main diagonal, and thus remain unchanged when these things are transposed. These things are invertible if and only if their determinant is nonzero. For 10 points, name these arrays of numbers with columns and rows.**

ANSWER: matrices (accept matrix)

14. **This city’s constitution forced inhabitants to use iron obol bars instead of coins. This city practiced the system of syssitia, where citizens would donate a percentage of their food to be redistributed. During marriages in this city, women were forced to shave their heads and dress in men’s clothes. This city’s (\*) Gerousia, or council of 28 elders, was established by Lycurgus. In order to become a citizen of this city, the capital of Laconia, men had to be educated in the agoge. For 10 points, name this Greek city state famous for its military prowess.**

ANSWER: Sparta

15. **Two Filipino athletes obtained the lowest possible score in this sport during the 2015 Southeast Asia Games. Despite suffering from a concussion due to participating in the Olympics in this sport, Greg Louganis still won a gold medal in the 10 meter finals for this sport. Athletes in this sport may utilize either the straight position, (\*) pike position, or tuck position before transitioning into a twist or somersault after leaping from a springboard. Minimizing splash upon entry is an important aspect of this sport. For 10 points, name this acrobatic sport of plunging into the water.**

ANSWER: diving

16. **One author from this country wrote a collection of patriotic poems in Mensagem as well as a “factless” pseudo-autobiography of Bernardo Soares. A poet with the heteronym of another writer from this country meets and befriends his spirit in “The Year of the Death of Ricardo Reis.” That writer is (\*) Fernando Pessoa. An entire city is plagued with the title condition except for the Doctor’s Wife in another work from this country, Blindness. For 10 points, name this home country of Jose Saramago that, in the Stone Raft, breaks off from Europe along with Spain.**

ANSWER: Portugal

17. **58 renditions of this painting include hooks near the top of the painting and 9 scenes of doves. Picasso’s version of this painting replaces an animal at its bottom awakened by a person’s foot with a white daschund. The central figure of this painting, the daughter of (\*) Queen Mariana and King Philip IV, is flanked by two ladies in waiting. In the foreground of this painting are 2 dwarfs and a mastiff. For 10 points, name this painting of the Infanta Margarita Theresa which features a self portrait of the artist, Diego Velazquez.**

ANSWER: *Las Meninas*

18. **Many vases depicting one of these events shows a scene with Penthesilea. Another one of these events occurred due to Heracles's 9th labor and Theseus's abduction of the Antiope from the Amazons. Another of these events occurring between Mount Othrys (\*) and Mount Olympus resulted in the imprisonment of the Titans in Tartarus. One of these events began after Paris was bribed by Aphrodite with the most beautiful woman in the world, Helen. For 10 points, name these events, one of which legendarily destroyed Troy.**

ANSWER: war

19. **One noninvasive method for this process involves detecting variations in resistivity through magnetotellurics. This process may also be achieved through locating traps or source rocks by recording and imaging reflected waves used in a seismic survey. The ideal goal for this process is to locate (\*) proven reserves, large examples of which are found in Canada's Athabasca Tar Sands and the Orinoco Belt in Venezuela, and may be found offshore. For 10 points, name this process of discovering underground fuel deposits that may later be recovered through fracking or drilling.**

ANSWER: oil exploration (accept natural gas or hydrocarbon exploration, accept answers indicating finding groundwater before "traps" prompt on answers indicating mapping the earth, surveying and mining with "for what purpose," prompt on answers indicating the finding of fossil fuels, prompt on drilling, hydraulic fracturing or fracking before mentioned)

20. **Raul Alfonsin attempted to control his military leader predecessors in this country by passing the Full Stop and Due Obedience laws. In this country, the loss of Viceroy Baltasar Hidalgo de Cisneros during the May Revolution led to the First Junta taking power. (\*) Jorge Videla, who began the Dirty War, became the leader of this country after a coup d'etat which removed Isabel, the wife of another leader of this country supported by the descamisados, or "shirtless ones." For 10 points, name this country where Juan Peron led the country from Buenos Aires.**

ANSWER: Argentina

## Bonuses

1. In this work, the protagonist, who is born with jade in his mouth, and ends up being forced into a sad arranged marriage with his thoughtful cousin Xue Baochai, rather than his prettier cousin Lin Daiyu. For 10 points each:

[10] Name this novel about the decline of the Jia family by Cao Xueqin.  
ANSWER: ***Honglouloumeng*** (accept ***Dream of the Red Chamber***)

[10] *Honglouloumeng*, which is thought to possibly mirror the decline of the Qing dynasty, is traditionally considered to be one of the Four Great Classics of this Asian country.  
ANSWER: **China**

[10] *Honglouloumeng* begins with a paradoxical couplet on these two concepts. These two opposing concepts are homophones with the Jia and Zhen families, and allude to the Buddhist idea of the material world being an illusion.  
ANSWER: **truth** and **false** (accept any answer indicating **truth** or **reality** and its opposite)
2. Fluorine likes bonding with friends. For 10 points each:

[10] Fluorine has the highest value of this property on the Pauling scale, the tendency for an atom to attract an electron pair towards itself.  
ANSWER: **electronegativity**

[10] Fluorine forms a particularly strong bond with this element in PTFE, or Teflon, contributing to the polymer's high stability. This element's tetravalency allows it to form a vast amount of different compounds.  
ANSWER: **carbon** (or **C**)

[10] Although molecules with fluorine carbon bonds aren't very reactive, a compound of five fluorine atoms bonded to this metalloid element forms the strongest known Lewis Acid, and reacts with nearly every compound.  
ANSWER: **antimony** (or **Sb**, accept **antimony pentafluoride** or **SbF5**)
3. This composer utilized a string quartet and 10 woodwinds in a one movement work in E major. For 10 points each:

[10] Name this Austrian composer of 2 Chamber Symphonies who led the Second Viennese School.  
ANSWER: Arnold **Schoenberg**

[10] Schoenberg pioneered the use of this technique which utilized every note of the chromatic scale. This technique thus ensured that each note was equally used, so that the composition would not have a key.  
ANSWER: **twelve tone** technique

[10] This string sextet by Schoenberg was written in just 3 weeks, and is based on a Dehmel poem about a woman walking through the woods after dusk  
ANSWER: ***Transfigured Night***

4. In the parallel architecture type of these structures, their fibers are parallel to the force generating axis. For 10 points each:
- [10] Name this voluntary muscle tissue whose fibers are composed of myofibrils.  
ANSWER: **skeletal** muscle
- [10] This type of skeletal muscle decreases the size of an opening. One of these muscles “of Oddi” controls the release of bile into the duodenum.  
ANSWER: **sphincter**
- [10] Another sphincter separating the small and large intestine serves to prevent reflux from this final section of the small intestine, which is followed by the cecum.  
ANSWER: **ileum**
5. According to the Samguk sagi, this kingdom was founded by Jumong, whose wife headed south to found the Baekje kingdom. For 10 points each:
- [10] Name this northernmost of the 3 kingdoms of the peninsula which now bears its name, along with Baekje and Silla. At its peak part of this kingdom extended into Manchuria and Siberia.  
ANSWER: **Goguryeo**
- [10] The Goguryeo ruled over much of this peninsular region. Refugees from the Goguryeo formed the Balhae in the far north of this region along with neighboring China and modern day Russia.  
ANSWER: **Korea**
- [10] This modern day Korean city served as the capital of the Goguryeo kingdom until it was conquered by the Tang Dynasty.  
ANSWER: **Pyongyang**
6. WHERE’S THE LAMB SAUCE?! In this bonus! For 10 points each:
- [10] Name this British restaurateur and television star known for his many Michelin Stars and yelling profanity at aspiring chefs in his reality show Hell’s Kitchen.  
ANSWER: Gordon **Ramsay**
- [10] Gordon Ramsay is also one of the 3 judges on this Fox reality TV show along with Aaron Sanchez and Joe Bastianich, which celebrated its 10th season in 2019. In this show, the judges determine the best home cook in America through a series of cooking tests.  
ANSWER: **Masterchef**
- [10] On his show Hell’s Kitchen, Gordon Ramsay often serves this creamy italian rice dish on his menu in order to test the chef’s cooking ability.  
ANSWER: **Risotto**
7. In one scene in this novel, the title character recovers a treasure before returning to Marseille and later buying the island where he found that treasure. For 10 points each:
- [10] Name this novel which recounts the revenge of the title character by Alexandre Dumas.  
ANSWER: **The Count of Monte Cristo**
- [10] This man is the protagonist and title character of *The Count of Monte Cristo*. Later in the novel he succeeds in his revenge, causing Villefort and Mondego to be arrested.  
ANSWER: **Edmond Dantes** (either underlined part is fine)
- [10] This Italian priest is Dantes’s best friend in prison. He teaches Dantes a variety of subjects and correctly deduces who betrayed Edmond.  
ANSWER: Abbe **Faria**

8. The Amration culture of this region was succeeded by the Gerzeh culture nearly 6000 years ago. For 10 points each:
- [10] Name this region where the Naqada cultures existed prior to the Old Dynasty.  
ANSWER: **Egypt**
- [10] This pharaoh may have been the last ruler of the Naqada III period. This man created the pschent crown by combining the White Hedjet crown of Upper Egypt and Red Deshret crown of Lower Egypt after he unified them.  
ANSWER: **Narmer** (accept **Menes**)
- [10] This protodynastic ruler of Egypt is known for a macehead that depicted his namesake animal. That macehead depicts the animal next to a picture of this ruler wearing the white crown of Egypt.  
ANSWER: **Scorpion**
9. For 10 points each answer the following about women and economics:
- [10] Economists Francine Blau and Lawrence Kahn claimed that differences in human capital were responsible for this phenomenon, which in the US is about 21 cents per dollar.  
ANSWER: the **wage gap** (accept any answer indicating a differences in wage for men and women)
- [10] Along with Milton Friedman, this economist wrote A Monetary History of the United States, which attributed the Great Depression to strict monetary policy by the Federal Reserve.  
ANSWER: Anna **Schwartz**
- [10] Janet Yellen, former Chair of the Federal Reserve, noted the problems with a flat slope of the Phillips Curve, indicating a low rate of this quantity. According to the Phillips Curve, it is inversely proportional to unemployment.  
ANSWER: **inflation**
10. In one scene from this work, Cyrus favors a stray puppy over an expensive knife, while Aron goes to Stanford to become a priest only to drop out and die after enlisting in the military. For 10 points each:
- [10] Name this novel about the Trask and Hamilton families, with many allusions to the book of Genesis.  
ANSWER: **East of Eden**
- [10] *East of Eden* was written by this American author, who considered it his magnum opus. This author wrote *East of Eden* in part to describe the Salinas Valley to his children.  
ANSWER: John **Steinbeck**
- [10] This son of Cyrus continues working hard at the farm despite inheriting lots of money from his father. He also attempts to murder his brother Adam and possibly fathers twins with Cathy.  
ANSWER: **Charles**
11. In some organisms, these compounds are released to signal for mates. For 10 points each:
- [10] Name these chemicals secreted primarily by eusocial insects of the same species to communicate with each other.  
ANSWER: **pheromones**
- [10] Nasonov pheromones are secreted by this type of bee to help forager bees navigate back to the hive. These female bees are contrasted with queen bees, which unlike this type of bee are able to reproduce.  
ANSWER: **worker** bees
- [10] These eusocial insects use pheromones to signal for a defense response or to mark a trail to guide them to food sources. The red imported fire species of these insects are invasive in the southeastern US.  
ANSWER: **ants**

12. For 10 points each answer some of the following about a certain important number in Jean Jacques David's paintings.

[10] Give this number of Horatii in David's *Oath of the Horatii*, all saluting their father who holds their swords.

ANSWER: **3**

[10] This item is often referred to as the tricolor. It appears in *Liberty Leading the People* and its red and blue shades were modified by David.

ANSWER: The **French Flag**

[10] Another painting by David shows this Roman deity being disarmed by the three graces and his lover. A Botticelli painting of this deity shows him asleep while baby satyrs carry away his lance and armor.

ANSWER: **Mars** (accept **Mars Being Disarmed by Venus**, do not accept or prompt on Ares)

13. This process is often described as the area under a curve. For 10 points each:

[10] Name this process which the fundamental theorem of calculus states is the opposite of differentiation.

ANSWER: **integration**

[10] This man created the first rigorous definition of an integral at the University of Gottingen. This man's integral can be calculated by dividing a region into shapes and adding up the total area.

ANSWER: Bernhard **Riemann**

[10] In 3 dimensional integration, this method is contrasted with the disc method since it calculates the volume of a solid when integrated along a perpendicular axis rather than a parallel one.

ANSWER: **shell** integration method

14. During the first of these events, its perpetrator sought to tell people "what has been done in the last few days, why it was done, and what the next steps are going to be" about the banking crisis. For 10 points each:

[10] Name these 30 radio addresses given to the American public between 1933 and 1934, meant to explain policies and reassure the public.

ANSWER: **Fireside** Chats

[10] This American president talked on the radio during the Fireside Chats. Among other things, he is also known for being the only president to serve 4 terms.

ANSWER: **Franklin Delano Roosevelt**

[10] The third fireside chat introduced this policy to the public. This agency was established to create fair practices and set prices between companies until it was dissolved by the Supreme Court in 1935.

ANSWER: **National Recovery Administration**

15. Killer Whales have been observed beaching themselves to hunt for seals in this location, where southern right whales also often observed. For 10 points each:

[10] Name this biodiverse South American peninsula which juts into the Atlantic Ocean, home to salt lakes up to 131 feet below sea level.

ANSWER: **Valdes** Peninsula

[10] The Valdes Peninsula is administered by this country, where the eastern half of the jagged Mount Fitzroy overlooks the Patagonian Icefield.

ANSWER: **Argentina**

[10] The southernmost portions of Patagonia are separated by this body of water from Tierra Del Fuego. This body of water is named for the explorer who named Patagonia.

ANSWER: **Strait of Magellan**

16. Many of these devices incorporate ceramics between layers of metal which act as electrodes. For 10 points each:
- [10] Name these devices which store charge and produce an electric field, sometimes consisting of two parallel plates. The namesake parameter of these devices is equal to the charge divided by the voltage.  
ANSWER: **capacitor**
- [10] The capacitance of a capacitor may be increased by inserting one of these substances in the electric field. These substances are polarized by the applied electric field and thus decrease the voltage.  
ANSWER: **dielectric**
- [10] When three identical capacitors with a capacitance of 6 units are placed in series, this is the equivalent capacitance of the system.  
ANSWER: **2** units
17. This movement was represented by the Cross of Lorraine, and was spurred by a six minute speech by Charles de Gaulle. For 10 points each:
- [10] Name this movement. The Affiche Rouge was used to discredit the members of the Manouchian Group who were involved in this movement.  
ANSWER: La **Resistance** (or the French **Resistance**)
- [10] La Resistance opposed this puppet regime established by the Nazis, named for the resort town that served as its capital.  
ANSWER: **Vichy** France
- [10] The founder of La Resistance, Jean Moulin, ultimately died after being betrayed and subsequently captured by this Nazi secret police force.  
ANSWER: the **Gestapo** (or **Geheime Staatspolizei**)
18. If you live in South Carolina, this is the second most likely faith for you to adhere to. For 10 points each:
- [10] Name this religion whose Hands of the Cause are a group appointed to spread and protect this faith. A temple for this faith in Wilmette, Illinois is the oldest in the US.  
ANSWER: **Baha'i**
- [10] Baha'i was founded by Bab, who repeatedly mentioned He whom God shall make manifest in the Bayan, one of these figures prophesied to save the world. In Judaism this term can also refer to a king or priest anointed with holy oil.  
ANSWER: **messiah**
- [10] The Seat of the Universal House of Justice, where the ruling body of the Baha'i religion resides, is found in this country's city of Haifa. The majority of people from this country adhere to the religion of Judaism.  
ANSWER: **Israel**
19. In this work, the author reminisces on "chairing" the title character "shoulder high" through the marketplace. For 10 points each:
- [10] Name this poem, which also mentions a "garland briefer than a girl's" and remarks that fields of glory "early through the laurel grows ... withers quicker than the rose."  
ANSWER: "**To an Athlete Dying Young**"
- [10] Like "To an Athlete Dying Young," this poem also belonged to the collection *A Shropshire Lad*. The speaker of this poem is told to "give crowns and pounds and guineas, but not your heart away" by a wise man.  
ANSWER: "**When I Was One-and-Twenty**"
- [10] *A Shropshire Lad* and "To an Athlete Dying Young" were written by this British poet.  
ANSWER: Alfred Edward **Housman**

20. For 10 points each, answer some of the following about the signs you might see while driving:

[10] This upside down triangular red and white sign indicates that the driver must give way to let another driver pass.

ANSWER: **yield** sign

[10] When encountering a stop sign, it is important to not commit this infraction in which the driver slows down but does not completely stop, as you will still be pulled over.

ANSWER: **rolling stop**

[10] A pentagonal yellow sign depicting a smaller and larger person indicates that you are entering one of these areas, where the speed limit is typically 25 miles per hour.

ANSWER: **school zone**