

Teterboro's Academic Packets of Intellectual Rigor
Packet 2

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Tossups

1. **This man's orchard names an array of trees on integer coordinates in a point lattice, and becomes the Dirichlet function when viewed diagonally. This man's formula uses variables m and n in three expressions for a , b and c which form a Pythagorean triple. Playfair's axiom can be used to replace this man's (*) parallel postulate, which, when relaxed, can result in lines curving away or towards each other when they are both transverse at right angles in one field of geometry. For 10 points, name this Greek mathematician who wrote the Elements.**

ANSWER: **Euclid**

2. **Henry Molaison was a patient used to study this concept, and performed tasks such as drawing figures by looking at its reflection in a mirror. A curve modeling the degradation of this quality was first created by Hermann Ebbinghaus, and is proportional to e to the negative time over its stability. According to Miller's law, the typical capacity of items for this concept is (*) 7 plus or minus 2 in its short term type, which is converted into its long term type in the hippocampus. For 10 points, name this ability which is deficient in people with amnesia.**

ANSWER: **memory**

3. **One project aims to reintroduce jaguars and red green macaws into Ibera National Preserve, which protects one of these ecosystems in Argentina. The state of Mato Grosso do Sul contains the largest of these ecosystems, the Pantanal, which along with the (*) Amazon is the native habitat of the giant otter. Although typically a savannah, the llanos region transforms into one of these ecosystems during the rainy season. Lake Okeechobee drains one of these locations that is west of Miami. For 10 points, name these flooded ecosystems exemplified by bayous and the Everglades.**

ANSWER: **wetlands** (accept **swamps**, floodplains and **marshes**, accept **bayou** and the **Everglades** before mentioned)

4. **One character in this play mocks her brother by calling him "symbol of a rising class" and "titan of the system." That character at first has straight hair, but later decides not to brush it. A plant that doesn't get enough water or light still grows "doggedly" under the care of a character in this play who wishes to grow a garden and (*) move her family out of their apartment. Walter and Beneatha both claim the money that Mama uses to buy a house in an all-white town in this play using a life insurance check. For 10 points, name this play about the Younger family by Lorraine Hansberry.**

ANSWER: **A Raisin in the Sun**

5. **A 1898 treaty allowing for the lease of Port Arthur allowed one country to extend this industry further south. During the Russo-Japanese war, the limitations of this industry on the Russian side contributed to their defeat, due to the proximity of the Japanese side. In the (*) Mukden Incident, a staged Japanese sabotage in this industry was used to justify the invasion of Manchuria. One structure built by this industry between 1891 and 1916 connected Vladivostok and Moscow. For 10 points, name this transportation industry which created a “Trans-Siberian” structure across Russia.**

ANSWER: rail (prompt on transportation before mentioned)

6. **This painter depicted three women engulfed in the sea with their hair mixing into the water around them in a painting criticized for being erotic decorating a university. Another painting by this artist depicts a lone woman surrounded by snakes as well as the baboon like Typhon flanked by the gorgons in his Beethoven Frieze. This artist depicted (*) Adele Bloch-Bauer in one work, as well as a man performing the title action on a woman before a bright yellow background in his most famous painting. For 10 points, name this founder of the Vienna Secession who worked with gold leaf in *The Kiss*.**

ANSWER: Gustav Klimt (first painting is *Jurisprudence*)

7. **Special relativity was tested by measuring the decay of a particle denoted by this letter in the Rossi-Hall experiment. Cosmic rays create that second generation lepton denoted by this letter. This letter denotes the reduced mass in the two body problem as well as the (*) permeability of free space. A unitless constant with this letter with the subscript s is larger than another constant of this letter with the subscript k which can be lowered with lubricants. For 10 points, name this greek letter which denotes the coefficient of friction.**

ANSWER: mu [accept muon]

8. **The protagonist of one novel by this author writes a story about a Rainmaker who lives in a society ruled by women. In another novel by this author, a young woman teaches the protagonist the fox trot. Later in that novel, the protagonist murders that woman after finding her with a saxophonist in a place (*) “for madmen only.” In another novel by this author, the people of Castalia, like Joseph Knecht, play the Glass Bead Game. For 10 points, name this German author who described Henry Haller’s stabbing of Hermine in the Magic Theater in *Steppenwolf*.**

ANSWER: Herman Hesse

9. **One derivative of this compound with an added methyl group is used as a solvent in paint thinner. The dinitro form of that derivative is used as an explosive. This chemical is produced from the hydrodealkylation of (*) toluene, and when it is hydrogenated, cyclohexane is created. This chemical with delocalized pi electrons between its central atoms is the simplest aromatic compound. This flammable petrochemical is responsible for the sweet smell of gasoline. For 10 points, name this hydrocarbon with chemical formula C₆H₆.**

ANSWER: benzene [prompt on C₆H₆ before mentioned]

10. **This man’s declaration of support to the Sultan led to a dispute that was ultimately settled by the Algenciras Conference after he visited Tangier. Members of this leader’s cabinet were accused of homosexual conduct in the Harden Eulenburg Affair. In another affair, this man claimed that the English were “mad, mad, mad as march hares” during an interview with the (*) Daily Telegraph. This man’s build up of his country’s navy included the construction of the Kiel Canal in his country’s north. For 10 points, name this last Kaiser of Germany, who abdicated shortly before his country’s loss in WWI.**

ANSWER: Kaiser Wilhelm II

11. **One novel by this author ends with the narrator studying science in isolation since he believes that society will soon revert to savagery. Earlier in that work, Montgomery destroys all the boats on the island, preventing Pendrick from leaving. In another work by this man, the main character receives two (*) white flowers in his pocket from Weena, whom he saves from drowning, unlike the other Eloi. Earlier in that novel, the man who uses the title device is attacked by Morlocks. For 10 points, name this British science fiction author of *The Island of Doctor Moreau* and *The Time Machine*.**

ANSWER: Herbert George Wells

12. **One man who voyaged with this explorer described him as a “sea ape” with a shark tail and long whiskers similar to a human mustache. This man died on his namesake island, which is the largest of the Commander Islands, and the International Date Line shifts diagonally through a (*) body of water named for him. This man was set on 2 Kamchatka expeditions, the second of which was known as the Great Northern Expedition, in order to explore Eastern Siberia for Peter the Great. For 10 points, name this Danish explorer who names the body of water separating Russia and Alaska.**

ANSWER: Vitus Bering

13. **Gerald Gardner promoted a faith known for performing this practice. Italian Americans may engage in the *stregheria* form of this practice, which requires nudity, sometimes during certain dates on the Wheel of the Year. Some people from a certain group practicing this action normally do so on a (*) full moon by raising a cone of power in a special circle, while another group does so in gatherings called covens. This practice is often performed by the Wicca and Satanists. For 10 points, name this alleged practice which led to the persecution of 19 women in colonial Salem.**

ANSWER: witchcraft

14. **The first work in a tetralogy in this genre depicts a monarch whose castle was invaded by enemies that “blew down the doors and boxed us in.” The second work in that series in this genre spurs to “call upon the torch tonight to bring out all the ghosts to light” and announces “it's time to (*) take back the night.” Another work in this genre describes a “hissing from right behind” before an organism “blows up” and includes a montage in which the protagonist makes a diamond sword. For 10 points, name this genre of music, exemplified by “Revenge,” which begins “Creeper? Aw man!”**

ANSWER: Minecraft songs (accept minecraft parodies and any answer indicating music or music videos about Minecraft; also accept any answer indicating music by Captainsparklez)

15. **Some of these environments are supported by oxygen absorbing pneumatophores. Along with seagrasses, these habitats are the primary nurseries for juvenile reef fishes. Over a quarter of these ecosystems have been destroyed for commercial shrimp farming. Most of these ecosystems are composed of the plant (*) *Rhizophora*, whose specialized glands are used to remove extra salt. The large stilt root systems of these ecosystems protect coastlines from erosion and flooding during storms. For 10 points, name these coastal, salt tolerant forests common in tropical areas.**

ANSWER: mangrove forests

16. **One civilization in this country often made use of spondylus shells in their artwork. Cream, reddish and black pigments were exclusively used on the molded pottery made by one culture in this country. The Paracas culture was centered on this country, where the Chimu preceded the (*) Moche culture, and produced textiles that were woven using alpaca wool. A sleeveless tunic was worn by another civilization centered on this country which used the quipu system and spoke quechua. For 10 points, name this country home to Cuzco, the capital of the Incan Empire.**

ANSWER: Peru

17. **This substance is often surrounded by proteoglycan 4 or lubricin, which is found in the synovial fluid. The growth of this substance, which does not contain blood vessels or nerves, is stunted in achondroplasia, and they are made of cells known as chondrocytes. The hyaline type of this substance is the most prevalent in the human body, while the (*) elastic type contains collagen II fibers. This substance is targeted by autoantibodies in rheumatoid arthritis. For 10 points, name this connective, rubber-like tissue in the body found in joints and the outer ear.**

ANSWER: cartilage (prompt on connective tissue)

18. **Upbow staccato double stops are played in the third movement of this composer's violin concerto, whose first movement replaces the development section with a cadenza. A tone poem by this composer represents the title figure of the underworld with a solo english horn. This composer of the (*) *Swan of Tuonela* included it in his *Lemminkäinen Suite*, and the last of a collection of 8 tableaux of this man which is now the national anthem of that northern european country. For 10 points, name this composer who wrote the *Karelia Suite* and *Finlandia*.**

ANSWER: Jean Sibelius

19. **The author wrote about a dictator who is given a decapitated head during a festival and commands his predecessor to give him a yam in *Kongi's Harvest*. In another play by this author, a chief is favored over a younger, progressive schoolteacher who refuses to pay a bride price by the beautiful (*) Sidi. In another play by this writer, the title character kills himself after seeing the dead body of his son Olunde after Simon Pilkings had earlier stopped him from performing ritual suicide. For 10 points, name this Nigerian playwright of *The Lion and the Jewel* and *Death and the King's Horseman*.**

ANSWER: Wole Soyinka

20. **This man won popular support as mayor of Buffalo after he vetoed a street cleaning bill that would have selected a higher bidder due to political connections In reference to his illegitimate child, opponents of this politician answered the chant "Ma, Ma, Where's My Pa" with "Gone to the White House, ha ha ha!" This president, a leader of the Bourbon Democrats, failed to reverse the national depression caused by the Panic of 1893, but was successful quelling the (*) Pullman Strike after he called in the army. For 10 points, name this only president to serve 2 non-consecutive terms.**

ANSWER: Grover Cleveland

Bonuses

1. For 10 points each, answer the following about some pink bodies of water:

[10] Dunaliella salina algae causes the pink color of this country's Lake Retba, or Lac Rose. That lake is located just north of this country's Cap Vert Peninsula.
ANSWER: **Senegal**

[10] In this nation, Lake Spencer, the Hutt Lagoon and Lake Hillier are all sometimes colored purple due to their high salinity. Other saline lakes in this nation include its largest, Lake Eyre.
ANSWER: **Australia**

[10] Although not pink, there does exist a lake in Gatineau Park which is named Pink Lake. That lake is found in this nation's large French speaking province of Quebec.
ANSWER: **Canada**

2. This ruler conquered both the Median and Lydian empires to expand his own empire. For 10 points each:

[10] Name this ancient emperor, whose namesake cylinder is the oldest known declaration of human rights.
ANSWER: **Cyrus** the Great (or **Cyrus II** or **Cyrus** the Elder)

[10] Cyrus was the founder of this empire. This empire was the largest in the world at the time, and was also the first to introduce an official language for the various different ethnic groups to use.
ANSWER: **Achaemenid** Empire (accept the first **Persian** Empire)

[10] Cyrus conquered the Nabonidus and the Neo-Babylonian empire during this battle along the river Tigris, after which he did not encounter any more significant resistance during his conquest of the Neo-Babylonians.
ANSWER: Battle of **Opis**

3. Packaging Fanta most often requires the Hall Heroult process to refine this element. For 10 points each:

[10] Name this silvery white metal commonly used in cans to store drinks and in foils
ANSWER: **aluminum**

[10] The Hall-Heroult process extracts aluminum from its oxide, alumina, which in turn is often extracted from this most common ore of aluminum.
ANSWER: **bauxite**

[10] The Bayer process extracts alumina from bauxite, during which this element is produced as a byproduct. A combination of this element and arsenic is used as a common semiconductor.
ANSWER: **gallium**

4. Many of these people adhere to the traditional Dreamtime belief system, which spiritually links the beginning of the world, the present and the future. For 10 points each:

[10] Name these native people of Australia.
ANSWER: **Aboriginal** People (or **Aborigines**)

[10] This deity is often to be considered the principal god of dreamtime. This being, often associated with the cycle of seasons and their changing colors as well as water, is said to inhabit waterholes which never dry up.
ANSWER: **Rainbow Serpent**

[10] In one dreamtime legend, a battle of 2 groups of ancient beings to the death resulted in the earth rising in grief to create this large monolith. This landmark is sacred to the aborigines, and thus climbing it is prohibited.
ANSWER: **Uluru** (accept **Ayers Rock**)

5. The heat death of the universe is one possibility arising from this rule. For 10 points each:
[10] Name this law, first formulated by Sadi Carnot, which states that the entropy of a closed system cannot decrease.
ANSWER: **2nd Law of Thermodynamics**
[10] Entropy is often defined as the natural log of the number of these entities multiplied by the Boltzmann constant. These entities are the possible arrangements of the molecules of a system.
ANSWER: **microstates**
[10] This man stated that heat cannot pass from a colder body to a warmer body without some external work, and also partially names a doubly eponymous equation for drawing coexistence curves.
ANSWER: Rudolf **Clausius**
6. Early poetry in this language included *Hyangga*, which was written in the idu script, although most modern works are now written in Hangul. For 10 points each:
[10] Name this language in which the *Songs of the Dragons Flying to Heaven*, a work about the Joseon dynasty, was written.
ANSWER: **Korean**
[10] One of the works most commonly translated into Korean is this religious text, central to the largest religion in Korea besides unaffiliation. This religious text was first introduced to Korea by Jesuit missionaries.
ANSWER: The **Bible**
[10] The idu script used in writing *Hyangga* was a modified version of the Hanga writing system which uses this script unlike Hangul.
ANSWER: **Chinese characters** (prompt on kanji)
7. This man impeached a corrupt governor of Bengal and wrote the pamphlet “Thoughts on the Cause of the Present Discontents.” For 10 points each:
[10] Name this Irish politician who opposed Jacobinism in “Reflections on the Revolution in France.” This rival of Warren Hastings was a member of parliament between 1766 and 1794.
ANSWER: Edmund **Burke**
[10] Edmund Burke was a member of this British Political Party, which were rivals with the Tories. This party also supported constitutional monarchism over absolute monarchism and should not be confused with a similar sounding american party.
ANSWER: **Whigs**
[10] Burke led the prosecution which impeached Warren Hastings and dealt with the role of this company’s role in Bengal. This company at one point accounted for half of all trade in the world.
ANSWER: the **British East India Company**
8. This condition often results from overexposure to ultraviolet radiation. For 10 points each:
[10] Name this condition that can often lead to skin cancers, but is easily preventable by sunscreen.
ANSWER: **sunburns**
[10] This designation labels the strength of a sunscreen. If a sunscreen has a value of 30 for this value, that means that 1/30 of the sun’s UV light will reach the skin through the sunscreen.
ANSWER: **sun protection factor**
[10] Homosalate, a common active ingredient in sunscreen, is an ester of this molecule. The acetylated form of this molecule is also known as aspirin.
ANSWER: **salicylic acid**

9. In the fourth act of this play, Oswald attempts to kill Gloucester under the orders of Regan, but is killed by Edgar. For 10 points each:
- [10] Name this play in which the title monarch abdicates and divides his kingdom between his daughters Goneril and Regan.
ANSWER: **King Lear**
- [10] This British playwright wrote *King Lear*. This writer also coined the word “swag” which people today use to describe the question writer.
ANSWER: William **Shakespeare**
- [10] This character is the youngest daughter of King Lear. Since she receives no land for not proclaiming her love to her father, the duke of Burgundy withdraws his marriage proposal.
ANSWER: **Cordelia**
10. This portion of cellular respiration is preceded by pyruvate decarboxylation. For 10 points each:
- [10] Name this process which reduces the majority of the electron carriers that will eventually pass their electrons in the electron transport chain.
ANSWER: **Krebs cycle** (or **Citric Acid Cycle** or **TCA cycle** or **tricarboxylic acid cycle**)
- [10] The Krebs cycle takes place in the matrix of this organelle, which is also the site of most of the energy production in the cell.
ANSWER: **mitochondria** (or **mitochondrion**)
- [10] The Krebs cycle reduces both NAD⁺ and this coenzyme. Riboflavin or vitamin B2 may convert into either FMN or this molecule for use in the body.
ANSWER: **FAD** (or **flavin adenine dinucleotide**, prompt on **FADH2**)
11. This composition’s ballet is scored for a 13 member chamber orchestra, and is about the spring celebration of a group of pioneers. For 10 points each:
- [10] Name this ballet, whose hymn “Simple Gifts” had its tune borrowed in the song “Lord of the Dance.”
ANSWER: **Appalachian Spring**
- [10] Appalachian Spring was composed by this composer, who also wrote *Billy the Kidd*, *Fanfare for the Common Man*, and *Rodeo*.
ANSWER: Aaron **Copland**
- [10] In this movement of Copland’s *Rodeo*, Roper and Cowgirl dance and have a kiss. This last movement of *Rodeo* contains a dance in 2/4 time.
ANSWER: **“Hoe-Down”**
12. The Locofoco faction of the Democratic party was founded in this state to oppose Tammany Hall. For 10 points each:
- [10] Name this state whose politics were once heavily influenced by Boss Tweed. A later member of Tammany Hall, Al Smith, governed it for 4 terms from Albany.
ANSWER: **New York**
- [10] Tammany hall was named after the Lenape leader Tamanend, who was given this title shared with the leader of Tammany Hall.
ANSWER: **Sachem**
- [10] This republican mayor of New York City notably defeated Tammany Hall. He remade many jobs to be based on merit rather than patronage now names an airport in Queens.
ANSWER: Fiorello **La Guardia**

13. The rows of this structure can be used to find the coefficients of an expanded algebraic expression. For 10 points each:

[10] Name this array of numbers whose top and two sides are all comprised of the number 1, and whose entries are equal to the sums of the two entries above it

ANSWER: **Pascal's Triangle**

[10] This theorem which describes the expansion of its namesake two term algebraic expression has its coefficients appear on Pascal's triangle.

ANSWER: **Binomial Theorem**

[10] The kth term of the nth row of Pascal's triangle can be calculated by using this function of n and k. It also gives the number of ways k things can be chosen from a set of n if order does not matter.

ANSWER: **combination**

14. This artist created illustrations for both Boy Scout calendars and the *Four Seasons* illustrations for Brown and Bigelow. For 10 points each:

[10] Name this American artist who painted the *Four Freedoms* paintings.

ANSWER: Norman **Rockwell**

[10] In the third painting of the *Four Freedoms* paintings, *Freedom from Want*, an elderly man stands behind an elderly woman in front of a white curtain serving a turkey on this holiday.

ANSWER: **Thanksgiving**

[10] Rockwell worked for this newspaper company for over 47 years, painting covers which included "Saying Grace" and the character Willie Gillis.

ANSWER: The **Saturday Evening Post**

15. In this play, the title character goes into a room and shoots herself after hearing about Eilert's suicide. For 10 points each:

[10] Name this play about the unhappy wife of George Tesman who burns Eilert's manuscript.

ANSWER: **Hedda Gabler**

[10] This Norwegian playwright of *Hedda Gabler* also wrote about Gerger's mistaking Hedvig's suicide for her killing of the title "wild duck" to prove her love for him in another play.

ANSWER: Henrik **Ibsen**

[10] In this other Ibsen play, Dr. Stockmann holds a speech about the town baths which the town finds offensive, leading his home to be vandalized. At the end of this play Dr Stockmann claims that he is the strongest man in town.

ANSWER: **An Enemy of the People**

16. A group of five women on the US team for this sport each achieved a medal in every event during the 2016 Rio Olympics. For 10 points each:

[10] Name this sport whose events include balance beam, vault, and floor exercise.

ANSWER: **gymnastics**

[10] This member of the US Women's Gymnastics team won the most events out of any american gymnast. Additionally, this woman is the only american to have medaled in every gymnastics event in the world championships.

ANSWER: Simone **Biles**

[10] The last event in which Simone Biles medaled in was this event. On this event's namesake apparatus, female gymnasts perform routines involving techniques like kips and transitions.

ANSWER: **uneven bars**

17. One character in this work constantly searches for “it” and picks cotton before “the bug” prevents him from settling down. For 10 points each:
- [10] Name this novel in which the narrator travels across America in 5 parts between 1947 and 1950. It features many important people from the Beat movement.
- ANSWER: **On the Road**
- [10] At the end of the novel, this character thinks about Dean Moriarty, who accompanied him on many of their journeys in a Cadillac. Throughout the journey, this man is urged to keep traveling by a dream of a shrouded figure.
- ANSWER: **Sal Paradise** (either underlined part is fine)
- [10] The character of Sal Paradise is based on this real life author of On the Road.
- ANSWER: Jack **Kerouac**
18. This man led a coalition with Charles James Fox, and formed a government that was notable despised by the then-reigning monarch. For 10 points each:
- [10] Name this Prime Minister who notably wrote “Oh my God! It’s all over” following the successful revolution of one of his country’s colonies in 1781.
- ANSWER: **Lord North** (or Frederick **North**)
- [10] One unfailure of Lord North was his successful handling over a crisis over a Spanish attempt to seize control of this archipelago. The UK later won a war against Argentina for control over this archipelago in the 1980s.
- ANSWER: **Falkland** Islands
- [10] Lord North and his coalition with Charles Fox were defeated by this man, who became the next Prime Minister. This man, whose father also served as Prime Minister, was the youngest man ever to hold the office.
- ANSWER: William **Pitt the Younger** (prompt on just William **Pitt**)
19. Bone eating worms are only found during these events. For 10 points each:
- [10] Name these events occurring after the sinking of a large cetacean carcass, creating a diverse ecosystem of scavengers.
- ANSWER: **whale falls**
- [10] Whale falls are large sources of nutrients for these regions, large flat portions of which are called abyssal plains. Giant tube worms are native to this region at the bottom of the ocean.
- ANSWER: the **seafloor**
- [10] Apart from whale falls and marine snows, much of the nutrients needed to support life on the seafloor, namely sulfur, come from these geothermal features.
- ANSWER: hydrothermal **vents**
20. This French philosopher worked alongside Henri de Saint-Simon to formulate some of his ideas. For 10 points each:
- [10] Name this man who created the Law of Three Stages, coined the term “sociology,” and founded the school of positivism.
- ANSWER: Auguste **Comte**
- [10] Comte’s school of positivism is seen as an extension of this theory, since all knowledge in positivism must come from information that comes through the senses.
- ANSWER: **empiricism**
- [10] Comte also founded the Religion of Humanity, one pillar of which is this concept that he coined, referring to moral actions done for the benefit of others.
- ANSWER: **altruism**