

FLopen 2020

Tiebreakers and Extras: Scroll the the end of Tiebreakers and Extras packet of FST 2019 for a surprise :o

Edited by: Taylor Harvey and Jonathen Settle

Written by: Mateo Javier Acosta, Mike Bentley, Nicholas Dai, Anthony Delgado, William Grossman, Shawn Jarrard, Zachary Knecht, Leo Law, Lalit Maharjan, Tracy Mirkin, Khanh Nguyen, Grant Peet, Ani Perumalla, Jason Zappulla, and the editors

Tossups

At a fancy dinner in this novel, an Indiana youth points out the wastefulness of a cluster of jewels worn by a nearby woman and trashes the writing of Albert Ross and Dora Thorne. The protagonist of this novel befriends her neighbor Mrs. Vance after first encountering her looking through the door of a shared dumbwaiter. A character in this novel has a breakthrough performance in a production of (*) *Under the Gaslight* attended by two characters vying for her hand. The title character of this novel leaves her shoe factory job and the apartment of her sister Minnie after being given ten dollars by a man she encountered on the train from Wisconsin. The title character has affairs with the traveling salesman Drouet and the businessman George Hurstwood before becoming a successful actress in, for 10 points, what naturalist novel by Theodore Dreiser?

ANSWER: *Sister Carrie*

<Long Fiction, TH>

In this novel, a woman breaks off an engagement with a pomade-using Austrian riding teacher after it is revealed that he is actually a servant girl swindler from Krakow. The opening paragraph of this novel contrasts the “prematurely-wrinkled hand” of one character with the “quick young fingers” of her daughter while discussing a note with the plump masseuse Mrs. Heeny. One character in this novel travels to Europe and has an affair with Peter (*) Van Deegen, who eventually ends their relationship after refusing to divorce his wife. This novel’s main character attempts to bribe the Pope into annulling her previous marriage so she can marry the Catholic Raymond de Chelles (“shel”). Ralph Marvell commits suicide due to his overwhelming debt to Elmer Moffat in this novel. The New York social climber Undine Spragg appears in, for 10 points, what Edith Wharton novel?

ANSWER: *The Custom of the Country*

<Long Fiction, WG>

To correct for port extensions on a vector network analyzer, a rotation is applied to charts of this quantity made up of non-concentric circles anchored to the right endpoint. A type of this quantity for coaxial cables equals the following: 138 over the square root of the dielectric constant all times the log of the ratio of the diameters of the conducting layers. VSWR (“viz-war”), which scales oppositely to return loss, is a figure of merit for how well a condition for this quantity is met. In a lossless transmission line, the square root of the inductance per unit length over the capacitance per unit length is the (*) characteristic form of this quantity.

Maximal power transfer occurs when the load’s value for this quantity is the complex conjugate of the source’s value for it. This quantity’s imaginary part is reactance. For 10 points, name this resistance to flow in AC circuits.

ANSWER: impedance [accept Z; accept characteristic impedance] (The lead-in refers to a Smith chart.)

<Physics, LM>

Ralph V. Turner's book on this monarch avoids mythologizing her, and he denounces her "black legend". This monarch used her husband's affair to make the Treaty of Montmirail favorable to her and her second son. This monarch patronized Wace ("wahss") and Benoît de Sainte-Maure ("bun-WAH duh sant-MOR"). According to the Polychronicon, this monarch's second husband built "a labyrinth of Daedelian design" at Woodstock for a Welsh woman. A medieval treatise written as a guide for the young man Walter reviews twenty-one (*) cases presided over by Ermengarde, Countess of Narbonne, Isabelle of Flanders, Marie of Champagne, and this late 12th century monarch. Andreas Capellanus's treatise *Art of Courty Love* references this monarch's time in Poitiers. For 10 points, name this mother of Richard I of England, a duchess of a southern French region.

ANSWER: Eleanor of Aquitaine [or Aliénor d'Aquitaine; prompt on Eleanor]
<Post-500 European History, GP>

A partnership between Codagenix and Open Orphan is planning to run the first of a specific type of these procedures in the US. Opponents of these initiatives sometimes use the case of Jesse Gelsinger as evidence for their imperfection. A *Lancet* article reviewing the ethics of one of these procedures by Jamrozik and Selgelid was written in response to a June 2020 paper by Nir Eyal et al. The (*) 1 Day Sooner initiative has accrued forty thousand volunteers for an initiative of this type, most of whom are in their twenties. A research group at Oxford is considering implementing one of these procedures to forgo traditional phase III human trials, which can take years. For 10 points, name this type of clinical trial in which participants are purposely infected to test vaccines, a controversial proposed method of quickening the development of COVID-19 vaccines.

ANSWER: human challenge trials [accept human challenge studies; accept controlled human infection trial or model or study; accept HCTs; accept CHIMs; prompt on any answers mentioning vaccine trials or development; prompt on any answers mentioning clinical or medical trials; prompt on gene therapy; prompt on answers like administering pathogens on purpose to test vaccines before "purposely"]
<Zeitgeist, TH>

When discussing this stuff, Seth Meyers stated "You gotta be careful man, a lot of people your age get scam calls and you'd need to reverse mortgage it." A photo posted by Twitter user @ogrods ("at O-G rods") that shows a world leader holding out some of this stuff to a rhea that is running away. This stuff came to prominence when an email describing the "Zelenko Protocol" was sent to Peter (*) Navarro. This stuff is promoted in a July 2020 video featuring Simone Gold, James Todaro, and Stella Immanuel. This substance's non-effectiveness came to light after an RCT conducted by French scientist Dider Raoult had to be abandoned due to subjects developing heart problems. For 10 points, name this substance, a drug used to treat Lupus patients and promoted by Jair Bolsonaro and Donald Trump as a miracle cure for COVID-19.

ANSWER: hydroxychloroquine [or HCO; accept Plaquenil; do not accept "chloroquine"]
<Current Events, ZF>

While standing in front of a drugstore, blacksmith James Wisner urged people to dispose of these objects, leading to a confrontation in which inspector Henry Miller shot him. An article in the *San Francisco Chronicle* described how a "whistle blew" and people flung these objects away with joy. Thomas Frederick Carter photographed a Georgia Tech football game in which everyone in the stands uses these objects. A short-lived "league" in San Francisco protested these objects and had excerpts from a State Board of (*) Health bulletin read at one of their meetings. Mayor James Rolph was fined fifty dollars by his own police chief for not wearing one of these objects to a boxing match in 1918. For 10 points, many American cities passed ordinances requiring the wearing of what coverings during the Spanish flu pandemic?

ANSWER: facemasks [accept surgical masks]
<US History, LM>

A Trotskyist presidential candidate from this country garnered 3 million views on Youtube for a viral trap song of puns on his unusual last name. Juan José Gómez Centurión, an anti-abortion candidate from this country, argued that the two leading candidates in one of its elections wanted to “hand out misoprostol like candy.” Despite attracting controversy for misogynistic tweets against his critics, the winning candidate of an election in this country pledged in televised debates to create a Ministry for (*) Women, Diversity, and Equality. Much of the 2019 election in this country focused on austerity policies intended to reduce public debt and its ongoing negotiations with the IMF. For 10 points, name this country where Alberto Fernández and his Peronist electoral alliance defeated incumbent Mauricio Macri.

ANSWER: **Argentina** [or **Argentine** Republic; or República **Argentina**]

<Current Events, MJA>

Bonuses

The first iterative and conjugative element to be discovered was originally thought to simply be one of these genetic elements. For 10 points each:

[e] Name these genetic elements that change their location in the genome. Barbara McClintock discovered them.

ANSWER: **transposons** [accept **transposable elements**; accept conjugative **transposons**; prompt on **jumping genes**] (The first iterative and conjugative element, or ICE, is Tn916.)

[h] In the CACTA (“C-A-C-T-A”) family of DNA transposons, these sequences always terminate in the namesake nucleotide motif. The first step in transposition of Mariner-like elements is the binding of a transposase to the protein binding element within these sequences.

ANSWER: **terminal inverted repeats** [or **TIRs**; accept **inverted terminal repeats** or **ITRs**; prompt on **inverted repeats**; prompt on **repeats**]

[m] The *Ac* (“A-C”) element and this transposon share terminal inverted repeats. McClintock discovered that this non-autonomous element only moves when activated by the autonomous element *Ac*.

ANSWER: **Ds** (“D-S”) element [accept **Dissociation** element]

<Biology, KN>

This text is often considered to be the earliest Chinese history text written with a definite chronology of events, and it was cited by Sīmǎ Qiān in *Records of the Grand Historian* to be the most important of the Five Classics. For 10 points each:

[m] Name this text attributed to Confucius that documents the ascension, deaths, marriages and wars of various rulers during the late Zhou dynasty.

ANSWER: **Spring and Autumn Annals** [or **Chūnqiū**]

[h] When writing about the Eastern Zhou dynasty in *Records of the Grand Historian*, Sīmǎ Qiān most frequently cited the *Spring and Autumn Annals* and this other Chinese text consisting of speeches attributed to rulers and other officials of Eastern Zhou. This text begins by covering the reign of King Mu of Zhou.

ANSWER: **Discourses of the States** [or **Guóyǔ**]

[e] Sīmǎ Qiān was a scholar and historian during this Chinese dynasty. The Ming dynasty writer Luo Guanzhong drew on the history of the fall of this dynasty in his *Romance of the Three Kingdoms*.

ANSWER: **Han** dynasty [accept Eastern **Han** or Western **Han**]

<World History, ND>

This potential combines a van der Waals attraction term with a repulsive term. For 10 points each:

[m] Name this computationally expedient potential used to model intermolecular forces. Typically, this potential's 12-6 form is used, but its 8-6 form is used for non-bonded interactions.

ANSWER: **Lennard-Jones** potential

[h] The Lennard-Jones potential is one of many pair potentials plugged into this integral to calculate the partition function. Cluster expansion approximates this integral that is generally written as the integral over (read slowly) d^3q to the 3-N of the quantity $e^{-U/qT}$.

ANSWER: **configuration** integral

[e] Once the configuration integral is calculated, the expression for this quantity for the gas is derived from kT times the partial with respect to volume of the natural log of the partition function. This quantity's SI unit is the pascal.

ANSWER: **pressure** [or **p**]

<Physics, JS>

The formulator of this method compared it to midwifery, as it brings out implicit definitions from the beliefs of the interlocutors. For 10 points each.

[e] Name this method of reasoning, in which a series of questions are posed against a thesis in order to expose all the possible contradictions in it. It was introduced by its namesake in *Theaetetus*, and employed in dialogues like *Crito*.

ANSWER: **Socratic** method [or method of **Elenchus**; or **elenctic** method; or **Socratic debate**]

[h] Socrates employs his method to discuss the definition of courage in this dialogue, in which he challenges Nicias' definition of it as "knowledge of and being hopeful in war and in every other situation" by asking if the Crommyon sow was courageous.

ANSWER: **Laches** ("LAK-eez")

[m] This concept arose when Socrates questioned a definition of piety by asking "Is the pious loved by the gods because it is pious, or is it pious because it is loved by the gods?" This concept's namesake was waiting to prosecute his father for manslaughter when he conversed with Socrates.

ANSWER: **Euthyphro dilemma** [accept answers indicating a **dilemma** or **paradox** faced by **Euthyphro**]

<Philosophy, LL>

Ian Hubert is known for his "lazy tutorials" for working with Blender's EEVEE ("EE-vee") engine, which performs this process in real time through rasterization. For 10 points each:

[e] Name this process performed on references like the Newell teapot and, in Blender, a monkey named Suzanne. This fundamental process in computer graphics uses 2D or 3D models to generate photorealistic images.

ANSWER: **rendering** [or image **synthesis**]

[m] This very common object type in 3D animation software is a collection of vertices, edges, and faces. In finite-element analysis, loads and displacements are applied to these objects.

ANSWER: polygonal **meshes** [accept **tessellations**; prompt on **polygons**]

[h] After textures, colors, and other styles are applied to a 2D surface, it can be "wrapped" onto a 3D mesh through this process. For more complex shapes, this process is applied along seams.

ANSWER: **UV** mapping [accept **UV** wrapping or **UV** unwrapping]

<Other Science: Computer Science, AP>

Answer the following about German operations overseas during the World War I, for 10 points each:

[e] After the capture of Qingdao, the German Asia Corps fled all the way across this ocean. Germany's colonial possessions in this ocean at the war's outbreak included the Solomon Islands.

ANSWER: **Pacific** Ocean

[h] Nicknamed the "Lion of Africa," this German general never lost a battle during his guerilla campaign in East Africa against the British. This general's legacy has been marred by his participation in the Herero genocide and the Kapp Putsch.

ANSWER: Paul von **Lettow-Vorbeck** [prompt on partial answer]

[m] The SMS *Emden* terrorized this Indian port city then governed by Lord Pentland, who had to employ twenty thousand police officers to dispel panic. This city's Nungambakkam neighborhood supplied the British Empire oil for fueling aircraft.

ANSWER: **Chennai** [or **Madras**]

<Post-500 European History, KN>

In a show from this country an inn caters only to ghosts on their way to the afterlife to allow them to complete their final wishes on Earth. For 10 points each:

[m] Name this country, the origin of the show *Hotel del Luna*. Other shows from this country include *Goblin* and *Crash Landing on You*.

ANSWER: **South Korea** [or **Republic of Korea** or **ROK** or **Taehan-minguk** or **Hanguk**; prompt on **Korea**; do not accept or prompt on "Democratic People's Republic of Korea" or "DPRK"]

[h] *Hotel del Luna* stars Yeo Jin-goo and this singer-songwriter. This singer-songwriter nicknamed South Korea's "little sister" and is known for the songs "Palette" and "Good Day."

ANSWER: **IU** [or **Lee** Ji-eun or **Li** Zhi-en]

[e] IU's single "Eight" was released with Suga, a member of this South Korean boy band, known for their singles "Fake Love" and "Blood Sweat and Tears." In 2019, this boy band released "Boys With Luv" with Halsey.

ANSWER: **BTS** [or **Bangtan Boys** or **Bangtan Sonyeondan**]

<Pop Culture, ND>

A character in this play drives away his boss and his boss's business partner with a sword when they accuse him of living in sin due to him not marrying in a church. For 10 points each:

[m] Name this play in which Kiguunda's daughter Gathoni weds John, resulting in a chain of events culminating in the loss of Kiguunda's most prized possession, a one-and-a-half acres of land.

ANSWER: ***I Will Marry When I Want*** [or ***Ngaahika Ndeenda***]

[e] *I Will Marry When I Want* was co-written by this Kenyan author of *Petals of Blood* and *A Grain of Wheat*.

ANSWER: **Ngũgĩ** wa Thiong'o [or James **Ngũgĩ**]

[h] Ngũgĩ's play *Maitu Njugira* is cited as an early example of this genre of drama popular in sub-Saharan Africa and Latin America, which often involves audience participation and improvisation. The three-word name for this movement references its common themes of economic and political justice.

ANSWER: **Theater for Development** [or **TfD**; prompt on **Theater of the Oppressed**]

<Drama, ND>

The ceiling of this station resembles a crypt from a Byzantine church. For 10 points each:

[m] Name this abandoned London Underground station, one of two stations built for the namesake attraction at the Great Exhibition of 1851. Its namesake structure was built by Joseph Paxton, and known for its use of plate glass and cast-iron.

ANSWER: High Level **Crystal Palace** Station

[h] The largest abandoned subway system in the world is located in this American city. The abandoned Race Street station in this city is a five minute walk from its Music Hall in its Over-the-Rhine district.

ANSWER: **Cincinnati**, Ohio

[e] This city's abandoned City Hall subway station is now used as a turning loop by the 6 train. The 6 train also stops at the Grand Central Terminal near 42nd Street in this city.

ANSWER: **New York** City [or **NYC**]

<Geography, LL>

Feng Shui specialists claimed that the two man-made islands within this structure look like the heads of two snakes facing each other, negatively impacting one of its namesake cities. For 10 points each.

[h] Name this bridge-tunnel system that connects three cities in the Pearl River delta. It contains the longest sea-crossing bridge in the world.

ANSWER: **Hong Kong-Zhuhai-Macau** Bridge [or **HZMB**]

[e] The railway crossing with the longest undersea portion in the world is this tunnel that connects Calais and Folkestone. Eurostar passenger trains run within this tunnel.

ANSWER: **Channel Tunnel** [accept **Chunnel**]

[m] The longest bridge in the US crosses this lake in Louisiana, the second largest saltwater lake in the US.

ANSWER: Lake **Pontchartrain**

<Geography, LL>

Answer the following about finding the derivatives of a function that maps a square matrix to one of its eigenvalues, for 10 points each.

[h] Assuming that the eigenvalues are simple, or that this quantity is one for all eigenvalues, simplifies the problem. An eigenvalue's value for this quantity is at most the matrix's dimension, but always (**emphasize**) *at least* a similar quantity.

ANSWER: **algebraic multiplicity** [prompt on **multiplicity**; reject "geometric multiplicity"]

[e] For a normalized eigenvector v and a real matrix Z with simple eigenvalues and this property, the derivative is simply v transpose times dZ times v . Matrices with this property are equal to their transpose.

ANSWER: **symmetric** matrix

[m] The proof that the eigenvalue function is infinitely differentiable relies on the Cayley–Hamilton theorem, which states that a matrix satisfies this equation. Eigenvalues are found using this equation that is written by setting the following equal to zero: the determinant of the difference between the matrix and lambda times the identity matrix.

ANSWER: **characteristic** equation [accept **characteristic** polynomial]

<Other Science: Mathematics, LL>

Answer the following about the 17th-century Scottish writer Martin Martin, who claimed he had extrasensory perception, a power most certainly gained while drunk. For 10 points each:

[h] Martin outlined this four-day-long ritual practiced in the Outer Hebrides in which black cats were roasted alive in hopes of conjuring Satan's legions. In the Highlands, this ceremony supposedly summoned a Cait Sith which granted wishes. You may give the Gaelic, Old English, or English name.

ANSWER: **Taghairm** [or **Taghaim**; accept **Aog Galdre** or "**echoing the ghost**"; prompt on summoning the dead or similar answers like necromancy by asking "what is the Gaelic term for that?"]

[e] Martin's perspective on the Taghairm ceremony was likely muddled by his remembrance of the "King o' The Cats," a Scottish story inspired by the life of this deity. This deity told his worshippers to cut the goddess Echo into pieces and spread her across the Earth.

ANSWER: **Pan**

[m] In the story of Ceridwen, she gives birth to a Cait Sith, a wolf, an eagle, and one of these creatures, which served as messengers to Scotland from the Otherworld. The expression "ask [this creature] what the druid knew" developed in the Early Middle Ages, as these creatures supposedly held the answer to immortality.

ANSWER: honey**bees** [prompt on insects]

<Mythology, ZF>

Carnival worker parents mutate their children to make them more interesting for a freak show while living in this US state in Katherine Dunn's novel *Geek Love*. For 10 points each:

[m] Name this state that is also the setting of a novel in which the conservative logging family patriarch Henry Stamper lives by the motto "never give an inch."

ANSWER: **Oregon**

[e] This author set his novels *Sometimes a Great Notion* and *One Flew Over the Cuckoo's Nest* in his native Oregon.

ANSWER: Ken **Kesev** [or Kenneth Elton **Kesev**]

[h] The author describes auditing classes at Reed College and compares Christian spirituality to the title artform in this acclaimed Oregon-set memoir by Don Miller.

ANSWER: **Blue Like Jazz**

<Other Literature, TH>

LLE is an algorithm for this technique that does not try to estimate global geodesics like Isomap, but, as a result, is more likely to place distant data points near each other. For 10 points each:

[h] Name this technique whose ability to outperform a less sophisticated technique is shown by applying both of them to the swiss roll dataset. This technique tries to learn an embedding from a data set to an underlying surface.

ANSWER: **manifold learning** [accept **nonlinear dimensionality reduction**; prompt on dimensionality reduction]

[m] Both locally linear embedding and Isomap begin by constructing a sparse graph from these things. A rudimentary classification algorithm begins by first identifying k of these things around a new input, and then assigning the input's class as the most common class among these things.

ANSWER: **nearest neighbors** [or **k-nearest neighbors** search; prompt on kNN or k \bar{N} N classification]

[e] Isomap is impractical for large datasets because it estimates global distances by performing this task for each pair of nodes in the graph. Dijkstra's ("**DIKE-struhz**") algorithm accomplishes this task.

ANSWER: finding the **shortest path** [prompt on pathfinding, path planning, or other descriptions of finding a path by asking "what type of path?"]

<Other Science: Computer Science, JS>

The near-IR of the cosmic infrared background is expected to contain a significant contribution from these stars in both its mean level and its anisotropies. For 10 points each:

[h] Name these stars. If they are indeed the seeds of super massive black holes, these stars would have to undergo near maximal accretion to reach 10^9 (“ten-to-the-nine”) solar masses by a redshift of about seven.

ANSWER: **Population III** stars [or **Pop III** stars]

[m] Maximal accretion rate is bounded by this value. The formula for this value, obtained by balancing radiation force with the force of gravity, is four pi times big- G times M times c over kappa, where kappa is the opacity.

ANSWER: **Eddington luminosity** [or **Eddington limit**]

[e] Black hole seeds go on to form supermassive black holes, whose accretion powers these luminous active galactic nuclei. These active galactic nuclei are named for the fact that they look like stars but have radio emissions.

ANSWER: **quasars** [accept **quasi-stellar radio sources**; accept **quasi-stellar objects** or **QSOs**]

<Other Science: Astronomy, ND>

In this game’s tutorial section, Ser Manuel recalls the story of when he was abandoned and left to die by his companion Blockner. For 10 points each:

[h] Name this 2016 Dodge Roll-developed bullet hell roguelike game in which the player traverses 5 stages of the title location to kill the characters’ pasts. A less well-received “Exit” expansion was released in March 2020.

ANSWER: ***Enter the Gungeon***

[m] *Description acceptable.* Discovering the Forge shortcut in *Enter the Gungeon* unlocks this mode in which the player fights such powerful enemies as the High Priest and Gatling Gull in quick succession. In *Hollow Knight*, this mode is activated by visiting the Hall of Gods.

ANSWER: **boss rush** [accept any answer about a mode where you are fighting only the **bosses**]

[e] One of the worst guns in *Enter the Gungeon* is the Klobb, an homage to this critically-acclaimed 1997 Nintendo 64 first-person shooter. In this game, James Bond pushes fellow agent Alec Trevelyan off a platform to his death.

ANSWER: ***GoldenEye 007***

<Pop Culture, ZF>