

## Western Invitational Tournament 2013

Packet by Oxford, Michigan (Kurtis Droge, Libo Zeng), King's College London (John Lawrence), and Southampton University (Matt Loxham)

### Tossups

1. Richard Titmuss argued that British blood banks were less wasteful than their American counterparts because of their reliance on this practice. Monotonicity and convexity are required conditions for Cox and Sadiraj's "egocentric" model of this practice in experimental economics. The dictator game lends support to this practice, usually modeled by placing a weight of alpha on one's own utility function and a weight of one minus alpha on (\*) another's. Bird warning calls are an example of the "reciprocal" type of this practice. Eusocial creatures such as naked mole rats display this practice via a form of kin selection. This word was derived from the French word for "others" by sociologist Auguste Comte. For 10 points, give this term for self-sacrificing behavior.

ANSWER: altruism [or word forms]

2. One of this author's characters repeatedly calls his son a bum after asking if he's married yet. In one of this author's plays, one character refers to another character's statement of "let it be on your head" as "The Curse of the Cat People". In one of his plays, a poker game breaks up after the players realize that another character has disinfected the playing cards. In that play by this author the title characters try double dating with the (\*) British Pigeon sisters. This author of *Come Blow Your Horn* wrote a play in which Corie Bratter tries to get her uptight husband Paul to unwind and a play in which neat-freak Felix Unger moves in with slob Oscar Madison. For 10 points, name this playwright of *Barefoot in the Park* and *The Odd Couple*.

ANSWER: (Marvin) Neil Simon

3. In one letter, this author described yielding to the "authority of the writer" to indulge his preference for historical fiction. Laelius makes his way to Syphax's court in the first section of one of this man's works, which was inspired by the third *deca* of Livy's *History of Rome*. He described the tendency of Chastity to overcome Love, and that of Fame to overcome Death, in his six-part (\*) *Triumphs*. This author of a "Letter to Posterity" described the heroics of Scipio Africanus during the Second Punic War in his epic poem *Africa*. This poet's most prolific works were compiled as *Rime Sparse*, which includes many of his namesake sonnets. For 10 points, name this Italian author of *Il Canzoniere*, which consists of many love poems to Laura.

ANSWER: Petrarch [or Francesco Petrarca]

4. During this politician's tenure as leader of his country, Neil Hamilton and Tim Smith were implicated in the "Cash-for-Questions" scandal. This politician, who campaigned under a "Back to Basics" slogan, was succeeded as leader of his party by William Hague, and replaced Nigel Lawson as Chancellor of the Exchequer directly before ascending to the post of prime minister. This politician signed the (\*) Downing Street Declaration with Albert Reynolds. On Black Wednesday, this prime minister's country withdrew from the European Exchange Rate Mechanism after the pound sterling crashed. For 10 points, name this Conservative Prime Minister from 1990 to 1997 who served between Margaret Thatcher and Tony Blair.

ANSWER: Sir John Major

5. In the *Aeneid*, Achaemenides recounts his encounter with this character. In one story, this character is the topic of a conversation between the sea nymph Doris and her sister. That sister, who is called a "milk white maid" by this figure in his love songs about her, later fell in love with the prince Acis, who was killed by this character. Although not (\*) Pygmalion, he fell in love with a woman named Galatea. In a more famous appearance, this character returned to his home to find men eating his cheese. He implored his father Poseidon to curse a man he originally thought was named "Nobody," who escaped from this character by hiding under a flock of his sheep after blinding him. For 10 points, name this cyclops from the *Odyssey*.

ANSWER: Polypheumus

6. One character in this movie makes up a story of how he once entered into a bathroom stoned and found several cops talking and a police dog. Secondary characters in this movie include “Nice Guy Eddie,” who is played by Sean Penn’s brother. In it, Steve Buscemi’s character states he doesn’t believe in (\*) paying tips, and that waitresses can do something else if they’re not making enough money. After shooting a black girl in the face, a demented ex-convict listens to “Stuck in the Middle with You” as he cuts a tied man’s ear off. The director of this movie gets shot in the head in his capacity as Mr. Brown. Other characters include Mr. Blonde, Mr. Pink and Mr. White, played by Harvey Keitel. For 10 points, name this Quentin Tarantino film about the aftermath of a botched jewel heist.

ANSWER: Reservoir Dogs

7. Before becoming king, one king of this name invaded Scotland alongside Alexander Stewart and recaptured the town of Berwick. That same king of this name received many of the lands and titles of his brother George, duke of Clarence after the latter’s rebellion and later became known as “Lord of the North.” This regnal name was claimed by the rebel (\*) Perkin Warbeck. Another king with this name contended with the Lord Appellant, confronted Wat Tyler’s rebels, and was succeeded by Henry IV. The first king of this name crusaded alongside Philip II of France and was imprisoned by Heinrich VI before being succeeded by his younger brother John. For 10 points, give this name of three English kings, including one nicknamed the “Lionhearted.”

ANSWER: Richard [accept Richard III, Richard IV, Richard II, or Richard I]

8. A popular tourist site in this nation consists of a walkway punctuated by a series of blowholes, an area called Pancake Rocks. This nation owns an island group called the Forty-Fours, part of the Chatham Archipelago. Viaduct Harbor is found at the shores of this nation’s largest city, which is nicknamed the “City of Sails.” Parts of this nation’s state of (\*) Otago form the southern part of the Canterbury Plains, which include Christchurch. This nation’s highest point lies in the Southern Alps and shares its name with that of a strait that separates its two sections. Auckland is located in this country, where *The Lord of the Rings* was filmed. For 10 points, name this nation that consists of two large islands located east of Australia, with its capital at Wellington.

ANSWER: New Zealand [or Aotearoa]

9. At the start of *Russian Easter Festival Overture*, this instrument’s section splits into three soloists and a tutti after a *dolce* solo by it. Four soloists from this instrumental section play in the opening of the *1812 Overture*. This instrument is the soloist in Tchaikovsky’s *Variations on a Rococo Theme* and Max Bruch’s (\*) *Kol Nidrei*. A solo prelude for this instrument consists almost entirely of G major arpeggios in a sixteenth note rhythm; that piece is the first in a collection of six solo pieces for this instrument by J.S. Bach. Concerti for this instrument include twelve by Luigi Boccherini, one by Edward Elgar in E minor, and one by Antonin Dvorak in B minor. For 10 points, name this string instrument played by Jacqueline du Pre, Mstislav Rostropovich, and Yo-yo Ma.

ANSWER: violincellos [or violincelli]

10. A group action of this space on the phase space giving the solutions of an ODE is called a flow. Up to homeomorphism, this space is the unique connected non-compact 1-manifold without boundary, and its one-point compactification gives the homeomorphic to  $S^1$ . In this space bounded monotone sequences converge, implying the (\*) Bolzano-Weierstrass theorem. Every non-empty subset of this space has a supremum, and, up to isomorphism, it is the unique Archimedean complete ordered field. The elements of this space can be constructed using Cauchy sequences or as partitions of the rational numbers called Dedekind cuts. Its elements are the fixed points under complex conjugation. For 10 points, name this space composed of the rational and irrational numbers.

ANSWER: real numbers [or real line; or R; or  $\mathbb{R}^1$ ]

11. One leader of this government was a founder of the Coalition of the Left, which consisted of Socialists and Radicals. From the right, left, and centre political parties, another leader of this government wished to form a “*union sacrée*,” or sacred union. In one scandal, this government covered up information regarding the progress of a (\*) canal across Panama. Paul Painlevé served as Prime Minister during this government and, in order to acquire indemnities, Raymond Poincaré ordered its invasion of the Ruhr. Perhaps the most controversial scandal in this government came to light after it was discovered Ferdinand Esterhazy gave state secrets instead of the Jewish Alfred Dreyfus. For 10 points, name this French government formed after the Paris Commune.

ANSWER: Third Republic [accept French Third Republic; accept *La Troisième République*; prompt on France; prompt on French Republic]

12. D'Alembert's principle generalizes the principle of this quantity's virtual form to dynamics. In a reversible process at constant temperature, this quantity equals the change of the Helmholtz free energy. Unless the force field is the gradient of a scalar field so the force is (\*) conservative, it is path dependent. It is the namesake of the minimum energy of photons required for the photoelectric effect. This quantity is given by the integral of  $PdV$ , and equals the difference between heat and change of internal energy by the 1<sup>st</sup> law of thermodynamics. In mechanics, it equals the change in kinetic energy. For 10 points, name this quantity given by the integral of  $F \cdot dx$ .

ANSWER: work [or work function]

13. One member of this family imagines a giant, black harpy bearing down on him and repeatedly pictures himself stabbing his father. Another member of this family envisions success as an alphabet, with Z representing the greatest men of a generation, and wonders how to advance to R from Q. That character is upset when a dinner guest asks for a second bowl of soup. A third member of this family worries that repairs to a (\*) greenhouse will cost fifty pounds. Its members Prue and Andrew die of childbirth and in World War I. Its youngest children Cam and James undertake a trip by boat with their father in the last section of the novel. For 10 points, name this family that appears alongside Lily Briscoe in Virginia Woolf's novel *To The Lighthouse*.

ANSWER: Ramsay family

14. One early Jurassic ancestor of this order is *viernaella herbsti*, which possessed its characteristic nine presacral vertebrae. A present-day member is able to survive dry conditions by burrowing underground and secreting a water-tight mucus cocoon. When this order reproduces, the male grasps the female in an amplexus. Yet another member of this order has large oocytes, making it useful for studies of (\*) body plan development. This order also contains the smallest known vertebrate, the model organism *Xenopus laevis*, and the colourful, toxic *phyllobates terribilis*; the aforementioned creatures are the "African clawed" and "golden poison dart" animals of this kind. For 10 points, name this order of amphibians whose larvae are known as tadpoles.

ANSWER: frogs [or Anura]

15. During the 1970s and 80s, this musician recorded four albums of duets with guitarist Joe Pass. A 1968 Berlin recording of "How High the Moon" by this musician blends its tune with Charlie Parker's "Ornithology" and incorporates "Smoke Gets in Your Eyes" in its coda. This musician's signature style was displayed on the song "(If You Can't Sing It) You'll Have to Swing It (Mr. Paganini)." Norman Granz produced her namesake (\*) "songbooks," a series of albums each dedicated to a different composer in the Great American Songbook. She made her name singing in the Savoy Ballroom with Chick Webb and with her recording of "A-Tisket, A-Tasket". For 10 points, name this "First Lady of Jazz," known for her scat singing.

ANSWER: Ella Jane Fitzgerald

16. This man devised the infamous Theoretical Minimum entrance exam, which only 43 students in his time were able to pass. He created a list ranking scientists according to productivity from 0 to 5 on a logarithmic scale, awarding only Einstein the highest score of 0.5. This scientist was renowned for "trivializing things" in his lecture style by explaining complex natural laws with simple language. Though he was incarcerated for a year on suspicion of being a (\*) German spy, this scientist led a team supporting the Soviet atomic program. He wrote the ten-volume *Course in Theoretical Physics* with his frequent collaborator Evgeny Lifschitz. For 10 points, name this Soviet theoretical physicist who won the Nobel Prize for Physics for his theory of superfluidity.

ANSWER: Lev Davidovich Landau

17. The novel *Nothing. No One.* takes place during the aftermath of a devastating earthquake in this country. In a poem set in this country, the "red walls" of the title location turn black. In one novel set during a violent time in this nation's history, Demetrio is murdered in a canyon by a group of Federal Soldiers. A promise to meet the title figure in Comala begins the journey taken by Juan Preciado in one novel from this native country of Elena Poniatowska and (\*) Mariano Azuela. One poem from this nation, where *Pedro Páramo* is set, describes "a crystal willow" and "a poplar of water," and has one line for each day of the Aztec calendar. For 10 points, name this home country of the poet of *The Sunstone*, Octavio Paz.

ANSWER: Mexico

18. This artist depicted a bearded king crawling on the floor of a cave with talon-like toenails in his picture of *Nebuchadnezzar*. In one of his pictures, dying men writhe on a woven mat on the floor while Death floats above them. In one of this artist's paintings, the title creature stands on a star-studded stage with curtains and extends its tongue towards a bowl of blood in its left hand. *The (\*) House of Death* is an illustration this artist of *The Ghost of a Flea* made of scenes from *Paradise Lost*. His most famous illustration shows the bearded title figure leaning out of the sun among the clouds and holding a compass. For 10 points, name this English Romantic who depicted Urizen in *The Ancient of Days* and illustrated his own *The Marriage of Heaven and Hell*.  
ANSWER: William Blake

19. One candidate in this election received a donation check with the note "Sock it to 'em" from John Wayne. In one party's primaries before this election, student volunteers in New Hampshire went door to door after cutting their hair; that effort was known as "Clean for Gene," referring to candidate Eugene(\*) McCarthy. A candidate in this election clinched his party's nomination after his main opponent was assassinated by Sirhan Sirhan. The winner in this election defeated Independent George Wallace and Democrat Hubert Humphrey. Robert Kennedy was assassinated during this election's Democratic primary race. For 10 points, name this presidential election in which Richard Nixon was elected to his first term.  
ANSWER: U.S. presidential election of 1968

20. In some regions, this holiday is celebrated by boys making human pyramids to reach a pot of buttermilk, which is then broken. In one country, this holiday is called Fagu Poornima. The Konkani incorporate this holiday as part of Sismo. This holiday is ended by Rangapanchami, and in some regions, it is commemorated with a one-week festival called (\*) Ganga Mela. It is celebrated on the last full moon day of the month of Phalgun. During this holiday, the sister of Hiranyakashyap is burned in effigy. This holiday celebrates Narasimha's rescue of Prahlada from being burnt alive. For 10 points, name this Hindu spring festival in which bonfires are lit and colored water and powder is thrown.  
ANSWER: Holi [or Festival of Colors; or Phagwah; or Dol Jatra; or Basantotsav; or Fagu Poornima before mentioned]

### Tiebreakers

21. Sir Walter Coutts was the last colonial Governor-General of this country that was later led by Bazilio Olara-Okello. In 1966, one leader of this country led an assault against Kabaka in the Battle of Mengo Hill. The Common Man's Charter laid out the principles that led to the proposed nationalization of 60% of this nation's industry in the Nakivubo Pronouncement, part of this country's (\*) "Move to the Left". Operation Thunderbolt was executed in this country, in which Yonatan Netanyahu led a rescue of hostages from a flight hijacked by the PFLP. The National Resistance Army was led by Yoweri Museveni in a civil war in this country. For 10 points, name this site of the Entebbe Raid, an African nation that was led by Milton Obote and Idi Amin.  
ANSWER: Republic of Uganda

22. One experiment that tested this theory measured the frequency change in a space-borne hydrogen maser. Another experiment testing this theory bounced radio waves off Venus and is named for Shapiro. The Mössbauer effect was used to decrease the (\*) redshift from recoil of an emitted photon in another experiment testing it. Another experiment measured the decay in the orbit of a binary pulsar. It was tested in the Pound-Rebka and Hulse-Taylor experiments, respectively. Calculating the precession in the perihelion of a planet and using a solar eclipse to measure the change in star positions when they were near in the sky to the sun where more classical experiments testing this theory. For 10 points, name this theory concerned with gravity formulated by Einstein.  
ANSWER: general relativity [or gravitational redshift; or gravitational time dilation; or gravitational waves; prompt on redshift or time dilation; prompt on relativity]

23. This philosopher argued that problematic situations should be resolved through a process of inquiry that doesn't merely alter the opinions of the inquirers, but rather produces what he termed a "consummatory" state of affairs. This philosopher divided moral frameworks into deontological theories of right, teleological theories of good, and theories of virtue. In one work, he argued that the purpose of aesthetics is to reforge the

**connection between everyday life and (\*)** fine art. Another work by him argues that the title form of government is dependent on how the second title concept conditions people to be a part of the community. For 10 points, name this American pragmatist philosopher who wrote *Art as Experience* and *Democracy and Education*.

ANSWER: John Dewey

## Bonuses

1. The Ogallala one in the U.S. is one of the world's largest. For 10 points each:

[10] Name these bodies of porous material containing significant amounts of groundwater.

ANSWER: aquifers

[10] This landform arises when pressure in a confined aquifer forces the water table above ground level.

ANSWER: artesian spring [or artesian well]

[10] This law states that the flux of a fluid through a porous medium is proportional to the pressure gradient over the fluid's viscosity, and is used to derive the groundwater flow equation.

ANSWER: Darcy's law

2. For 10 points each, answer these questions about the Boxer Rebellion:

[10] This lady was the de facto ruler of China during the Rebellion and threw her support behind it.

ANSWER: Ci Xi [or Dowager Empress]

[10] The Boxers believed that with the right training, they could render their bodies impervious to these weapons, frequently used by Western armies. They were wrong.

ANSWER: guns [or bullets; or any specific types of those answers]

[10] Emperor Guangzu attempted to expand the scope of the Self-Strengthening Movement during this period, which was halted by the Dowager Empress

ANSWER: Hundred Days Reforms

3. The upper left corner of this painting is filled by a sail that is mostly out of view. For 10 points each:

[10] Name this painting in which a man in dark blue with his back to the viewer rows the oars as a woman sits across from him with a child in her lap.

ANSWER: *The Boating Party* [do NOT accept "Luncheon of the Boating Party" as that is a completely different painting]

[10] *The Boating Party* is by this female American Impressionist who painted many depictions of mothers and their children.

ANSWER: Mary Cassatt

[10] Cassatt trained at the Academy of Fine Arts in this American city. Thomas Eakins also trained at this city's Academy, which houses some of his best-known works.

ANSWER: Philadelphia

4. For 10 points each, name some things related to mass spectroscopy.

[10] Mass spectroscopy sorts chemicals by the ratio of their mass to this quantity. This quantity is  $1.6 \times 10^{-19}$  Coulombs for an electron.

ANSWER: charge

[10] Mass spectrometers contain this device, which contains charged particles with an AC field of constant frequency but changing amplitude; the particles are sorted when the potential is altered. It comes in 1D or 3D kinds.

ANSWER: ion trap [or ion storage trap; or Paul trap; prompt on trap; also accept more specific varieties]

[10] MALDI is a technique often used to ionize this type of macromolecule with the help of a laser and a matrix. These macromolecules are often synthesized with the solid-phase technique or by the Strecker synthesis.

ANSWER: proteins [or polypeptides]

5. This body issued *The Declaration of the Causes and Necessity of Taking Up Arms*. For 10 points each:

[10] Name this body responsible for adopting the Declaration of Independence and the Articles of Confederation.

ANSWER: Second Continental Congress [prompt on Continental Congress]

[10] This man succeeded Peyton Randolph as president of the Second Continental Congress and was the first governor of an independent Massachusetts. He signed the Declaration of Independence with a huge signature.

ANSWER: John Hancock

[10] John Dickinson wrote the final draft of this measure adopted by the Second Continental Congress in July of 1775 in an attempt to avoid war with England. Of course, it failed.

ANSWER: Olive Branch Petition [or Humble Petition; or Petition to the King]

6. Its third movement depicts the title character's wedding, and the second movement "Romance" features a solo for double bass. For 10 points each:

[10] Name this 1934 suite that takes music from a film score the composer had written. It includes a popular "Troika".

ANSWER: Lieutenant Kijé Suite, Op. 60

[10] The *Lieutenant Kijé Suite* is by this Soviet composer of *Peter and the Wolf*.

ANSWER: Sergei (Sergeyevich) Prokofiev

[10] Prokofiev's symphony of this number has a gavotte as its third movement. Prokofiev's piano concerto of this number begins and ends with the same theme in D-flat major.

ANSWER: No. 1 [accept word forms like "first"]

7. He believed that the mind used the process of abstraction to draw "intelligible species" from "phantasms," or raw sensory data. For 10 points each:

[10] Name this medieval thinker who refuted Aquinas' doctrine of analogy and extended Anselm's univocal predication argument to argue that all "pure perfections" originate from God.

ANSWER: John Duns Scotus

[10] This work by Peter Abelard arranged 158 theological questions into a series of positive and negative responses from Church authorities as part of his religious dialectical reasoning.

ANSWER: Sic et Non [or Yes and No]

[10] This other thinker's work on logic included splitting the theory of supposition into three parts: personal, simple, and material. He is better known for a law of parsimony, known as his "razor."

ANSWER: William of Ockham

8. The James bond film series celebrated its 50th anniversary in 2012. For 10 points each:

[10] Name this man who, along with Harry Saltzman, co-produced the James Bond films. His daughter Barbara continued the family's involvement in the series after this man's death in 1996.

ANSWER: Albert R. Broccoli [accept Cubby Broccoli]

[10] This actress, also famous for her role as Emma Peel in *The Avengers*, played James Bond's wife Tracy di Vincenzo in the film *On Her Majesty's Secret Service*.

ANSWER: Diana Rigg

[10] This character, responsible for the shooting of Diana Rigg's character, was played by Donald Pleasance in *You Only Live Twice*, Telly Savalas in *On Her Majesty's Secret Service*, and Charles Gray in *Diamonds Are Forever*.

ANSWER: Ernst Stavro Blofeld

9. The second novel in this work chronicles the adventures of The Great Mahlke and is titled *Cat and Mouse*. For 10 points each:

[10] Name this set of novels, which includes *The Tin Drum* and one in which Walter Matern realizes why Nazism is terrible, *Dog Years*.

ANSWER: Danzig Trilogy [or Danziger Trilogy]

[10] The *Danzig Trilogy* is by this contemporary German author.

ANSWER: Günter Wilhelm Grass

[10] Tulla Pokreifke encourages Paul to document the sinking of the *Wilhelm Gustloff* in this Grass novel, as a result, Paul's son Konny becomes a Nazi apologist, which nobody really ever wants.

ANSWER: Crabwalk [or *Im Krebsgang*]

10. This film was the final screen performance of Victor Sjöström. For 10 points each:

[10] Name this film in which a series of hitchhikers inspire dreams and memories in Professor Isak Borg as he journeys towards Lund to receive a degree.

ANSWER: Wild Strawberries [or Smultronstället]

[10] *Wild Strawberries* is by this Swedish director, who also made a film in which a knight plays chess with Death, *The Seventh Seal*.

ANSWER: (Ernst) Ingmar Bergman

[10] This Bergman takes place in one day on an island resort, at which the schizophrenic Karin attempts to recover

from her condition and Minus tries hard to have a real conversation with his father, David.

ANSWER: *Through a Glass Darkly* [or *Såsom i en spegel*]

11. This model was developed after observations of the axons of giant squids. For 10 points each:

[10] Name this key biophysics model, which uses Ohm's law to describe the behavior of a certain type of cell. It is fundamental to understanding the refractory period following the action potential.

ANSWER: Hodgkin-Huxley model

[10] The Hodgkin-Huxley model models this type of cell, which make up the nervous system.

ANSWER: neurons [prompt on nerve cell]

[10] The Hodgkin-Huxley model has been further improved upon by models that take into account the geometries of these branched projections extending from the soma or cell body.

ANSWER: dendrites

12. In this play, Bartley is killed while trying to sell a horse at a fair. For 10 points each:

[10] Name this play set in the Aran Islands, in which the last of Maura's sons drowns like all of the other male members of the family.

ANSWER: *Riders to the Sea*

[10] *Riders to the Sea* is by John Millington Synge, who drew on the Noh drama produced in this country by Zeami for his comedy *The Well of the Saints*.

ANSWER: Japan [or Nihon-koku; or Nippon-koku]

[10] The Abbey Theatre was co-founded by Edward Martyn, W.B. Yeats, and this Irish playwright, who wrote *Spreading the News* and collaborated with Yeats on *Cathleen ni Houlihan*.

ANSWER: Isabella Augusta, Lady Gregory [or Isabella Augusta Pearse]

13. It included the Aragonese Crusade. For 10 points each:

[10] Name this conflict that erupted from a rebellion started in the namesake island on Easter of 1282 against Charles I. Sperlinga was allegedly the only town to shelter the French victims of this event.

ANSWER: War of the Sicilian Vespers

[10] Charles I of Sicily was part of the branch of the House of Anjou of this French dynasty, whose direct house ruled France from 987 to 1328.

ANSWER: Capetian Dynasty

[10] Charles I of Sicily was the younger brother of this French king who perished in Tunis during the Eighth Crusade and was later canonized.

ANSWER: Louis IX [or Saint Louis; prompt on Louis]

14. For 10 points each, name some mad scientists and their circa-WWII experiments:

[10] This German "Angel of Death" arbitrarily amputated and conjoined the limbs of the Lilliput Troupe and, more notably, twins. Perhaps more usefully, he also researched the etiology of the gangrenous disease noma.

ANSWER: Josef Mengele

[10] Like Mengele, this Japanese bioterrorist also managed to avoid punishment of any kind after WWII. This man led Unit 731 and referred to the human guinea pigs he received from the Kempeitai as his "logs."

ANSWER: Shiro Ishii

[10] Like Ishii, the American scientist John Cutler also infected his ignorant test subjects with syphilis in Guatemala and in this Alabama city, home to an incredibly immoral experiment conducted only on black men.

ANSWER: Tuskegee

15. This type of fluid instability occurs when a lighter fluid pushes on a heavier fluid. For 10 points each:

[10] Name this doubly eponymous type of fluid instability that can be seen in the Crab Nebula.

ANSWER: Rayleigh-Taylor instability [prompt on RT instability]

[10] In a Rayleigh-Taylor instability, this type of fluid flow, as opposed to laminar flow, may occur, where the small scale motions are described by the Kolmogorov microscales.

ANSWER: turbulent flow [accept turbulence]

[10] In a Rayleigh-Taylor instability, deviations from Kolmogorov's law relating this quantity to the 5/3 power of length can be observed. Bernoulli's law relates the pressure of a fluid to two other forms of this quantity.

ANSWER: energy per unit mass per unit time [accept kinetic energy or potential energy]



16. The “expenditure method” for calculating this value involves adding the difference between exports and imports to the sum of private consumption, gross investment, and government spending. For 10 points each:

[10] Give this measure of the value of all of a country’s goods and services. It is often evaluated per capita to estimate the country’s standard of living.

ANSWER: **GDP** [or **Gross Domestic Product**]

[10] This economist, who created the pleasant-sounding “Misery Index” to estimate stagflation, postulated that a country’s GDP will fall by 2% from its optimal level for every 1% increase in the unemployment rate.

ANSWER: Arthur Melvin “Art” **Okun**

[10] When analyzing the relative value of different currencies in the world economy, GDP is often adjusted for this other alliteratively-named concept. The “international dollar” and Big Mac Index are used to measure it.

ANSWER: **PPP** [or **purchasing power parity**]

17. Name some Biblical kings of Israel or Judah, for 10 points each.

[10] This King of Judah and Israel slew Goliath and was father to Solomon and wife to Bathsheba.

ANSWER: **David**

[10] This husband of Jezebel was condemned by Elijah for allowing a temple of Baal to exist with Israel and for seizing Naboth’s garden with a sham treason charge.

ANSWER: **Ahab**

[10] This king of Judah stopped child sacrifices to Molech and instituted the Deuteronomic Reform. According to the Book of Kings, he was killed by Necho II after refusing to let the Egyptians pass through his kingdom.

ANSWER: **Josiah**

18. This novel became the basis for Erich von Stroheim’s film *Greed*, which had over 85 hours of footage before editing. For 10 points each:

[10] Name this novel about a San Francisco dentist who marries the miserly Trina after she wins \$5,000. It ends with the title character handcuffed to his dead cousin Marcus’ corpse in the desert.

ANSWER: **McTeague**

[10] *McTeague* is a novel by this American author who worked as a war correspondent for McClure’s during the Spanish-American War. His novel *The Wolf* was only in the conception stages when he died.

ANSWER: Frank **Norris**

[10] Norris’s novel *The Octopus* fictionalized the struggle between ranchers and a company involved in this industry, as seen in the real life Mussel Slough Tragedy.

ANSWER: **railroad** industry [or **train** industry; or **locomotive** industry]

19. Pan orchestrates the initial events of this play, including the meeting of Sostratos and Knemon’s daughter. For 10 points each:

[10] Name this play that ends with a double wedding in which Sostratos marries Knemon’s daughter and Gorgias marries Sostratos’s sister. These weddings only occur because Gorgias rescues Knemon from a well.

ANSWER: *The Grouch* [or *Dyskolos*]

[10] Menander’s *The Grouch* is considered an exemplar of the “New” form of this dramatic form, which Aristotle differentiated from tragedy and satyr plays in *Poetics*.

ANSWER: **comedy**

[10] Because none of Menander’s full plays were found until the 1950s, critics often surmised how his plays must have been by studying the work of this Roman playwright of *The Eunuch* and *The Self-Tormentor*, a former slave.

ANSWER: **Terence** [or Publius **Terentius** Afer]

20. Last year, this leader finally removed travel restrictions on the citizens of his country and permitted car and home ownership. For 10 points each:

[10] Name this President of Cuba, who succeeded his brother, Fidel.

ANSWER: Raúl Modesto **Castro** Ruz

[10] This member of the Cuban Politburo was recently announced as the successor to Raúl Castro as President of Cuba.

ANSWER: Miguel **Díaz-Canel** Bermúdez

[10] To date, Díaz-Canel’s travels have taken him to Venezuela, where he has befriended this man, who has been

running the nation as acting president after the death of Hugo Chávez.

ANSWER: Nicolás **Maduro** Moros

21. Answer some questions about the Quest for the Golden Fleece, for 10 points each.

[10] This hero is the leader of the Argonauts. He abandons Medea to marry Creusa, causing her to kill the children they had together.

ANSWER: **Jason**

[10] On their journey, the Argonauts defeat this bronze giant who guards the island of Crete by pulling out the nail in his heel that stops the ichor from leaking out of him.

ANSWER: **Talos**

[10] Heracles parts ways with the Argonauts after this armbearer of his is kidnapped by nymphs. In some versions of the myth, he is Heracles' son with the naiad Melite.

ANSWER: **Hylas**

22. IEEE 754 is the standard defining this representation. For 10 points each:

[10] Name this representation of numbers in a computer, in which a number is stored as a sign bit, base, and an exponent. Forms include single and double precision.

ANSWER: **floating point**

[10] In integer representations, this operation is applied to a number  $k$  to represent  $-k$ , and is given by  $2^N - k$  for some fixed  $N$ .

ANSWER: **two's complement**

[10] Two's complement works because computers use this type of arithmetic, which wraps around so  $2^N$  equals zero for some  $N$ .

ANSWER: **modular** arithmetic