

VCU Open '15 – Packet 11

Questions by Cody Voight, Will Nediger, Evan Adams, Kenji Golimlim, and Matt Bollinger

1. **Roberto Benigni plays a member of this profession who gives a priest a heart attack by confessing that he has had sex with a pumpkin, a sheep, and his brother's wife. The director Jafar Panahi plays a member of this profession in the film that won the Golden Bear at the 2015 Berlin Film Festival. Each segment of Jim Jarmusch's *Night on Earth* focuses on a member of this profession. A member of this profession named (*) Wizard says "You get a job, you become the job" to another member of this profession, who takes a date to see the Swedish sex film *Language of Love*. A character with this profession attempts to assassinate Senator Palantine and tries to help the teenage prostitute Iris. For 10 points, name this profession of Travis Bickle in a Martin Scorsese film.**

ANSWER: taxi drivers [or: cab drivers, cabbies]

2. **The identity of one participant in this event was confirmed when she recalled the name of her pet pigeon Jenny. A popular theory about it concerns radio operator Kenneth Ormiston and his affair with a "Mrs. X" at his seaside cottage in Carmel-by-the-Sea. A newspaper challenged one person involved in this event to quiet doubters by walking twenty miles through the desert. A Grand Jury investigation into it did not locate "Steve" or "Mexicali Rose," who had allegedly signed a note "The Avengers." It caused a (*) 1926 media circus as newspapers first reported on an apparent drowning and then disbelievingly on the explanation provided by the subject of this event that she had escaped from kidnappers in Mexico. For 10 points, name this scandal surrounding the alleged disappearance of the female evangelist who founded the Foursquare Gospel.**

ANSWER: disappearance of Aimee Semple McPherson [or: obvious equivalents]

3. **Controversy over where exactly the precursors of this molecule come from was stirred by early 2000s studies of Baroja-Fernández et al. and Muñoz et al. In higher plants, sedimentable organelles containing this molecule direct the gravitropism response. The enzyme SEX1 is involved in the breakdown of this molecule. This molecule is synthesized by a namesake synthase from the precursor ADPG, which is created by AGPase. Lugol's solution turns black when this molecule is present. In contrast to monocots, whose main (*) photosynthate is sucrose, the main photosynthate in dicots is this compound. This molecule consists of amylose and amylopectin and its degradation to simple sugars is catalyzed by the enzyme amylase, present in saliva. For 10 points, name this plant storage carbohydrate commonly detected by iodine staining.**

ANSWER: starch [or: amylum]

4. **This man's assassin was nearly killed after his throat was cut by a lesser-known Roger Williams during a siege of Rouen. This man charged at Sinan Pasha with an axe while traversing the marshy terrain near Calugareni. Szekelys serving under this man brought him the head of Andrew Bathory after the Battle of Selimbar, allowing him to march into Alba Iulia. After the Battle of Guruslau, this man was assassinated by one of his ally's generals, Giorgio Basta. This ruler allied with Holy Roman Emperor Rudolf II during the 1593-1606 (*) Long War against the Ottomans. This man was the first to simultaneously rule over all three provinces of Moldavia, Wallachia, and Transylvania. For 10 points, name this unifier and national hero of Romania.**

ANSWER: Michael the Brave [or: Mihai Viteazu]

5. This poet wrote that “every day, four million ducks, five million pigs, two thousand pigeons, are killed to please the dying” in an angry poem in which he denounces “all who ignore the other half.” He wrote about two friends climbing “up to the high balconies” in a poem which repeats the image of “the ship out on the sea” and “the horse on the mountain.” That poem, “Sleepwalking (*) Ballad,” is best remembered for its opening line, “Green, how I want you green.” The speaker repeatedly cries “I will not see!” in “The Spilled Blood,” a section of a poem by this author mourning an event which takes place “at five in the afternoon.” For 10 points, name this poet of “Lament for the Death of a Bullfighter,” who was executed during the Spanish Civil War.

ANSWER: Federico (del Sagrado Corazón de Jesús) García Lorca

6. In hot dark matter models, these phenomena are washed out by free-streaming of relativistic particles. These things are modeled by a power spectrum proportional to k^{-n} , where n is one as argued by Harrison, Zeldovich, and Peebles. In an Einstein-de Sitter universe, their growth factor is equal to the scale factor. Hawking, Starobinsky, and Guth independently showed that (*) inflation gives rise to these phenomena. These phenomena grow over time due to their own self-gravity, increasing the relative density contrast of the universe. Evidence for the existence of these phenomena at redshifts approaching 1000 is provided by the anisotropy of the CMB. For 10 points, identify these seeds of all the large-scale structures of the present universe, as they’re amplified over time.

ANSWER: small density fluctuations [or: primordial fluctuations, quantum fluctuations, density perturbations, density variations; prompt on: “inhomogeneities”]

7. The narrator of one story by this man classifies the people he sees from a coffeehouse window as gamblers, pickpockets, junior clerks, and upper clerks. That narrator follows a decrepit old man through the streets of London all night, before realizing the man is “the type and genius of deep crime.” The narrator of another story by this man repeats “I am safe – I am safe” in an unsuccessful effort to prevent himself from the inexplicable urge to confess to poisoning a candle. This author of (*) “The Man of the Crowd” wrote a story in which a prisoner uses the meat left for him as food to get some rats to chew off his ropes, saving him from a swinging blade. For 10 points, name this author of “The Imp of the Perverse” who wrote about a man barely escaping the inquisition in “The Pit and the Pendulum.”

ANSWER: Edgar Allan Poe

8. Artifacts from this civilization include shells carved into small masks depicting the “long-nosed god.” This civilization’s usage of shell-tempered pottery is one of the features that distinguishes them from the earlier Woodland Tradition. It was not based on Easter Island, but copper plates from this civilization depict a figure known as the birdman. This civilization’s reliance on (*) maize left its settlements particularly vulnerable to drought. This civilization was spread out across much of the Midwest and Southeast and lasted from around 700 AD to the time of European exploration. Tribes that were a part of this civilization created dozens of raised earth mounds at Moundville and Cahokia. For 10 points, name this civilization named for the long river whose run approximately traces its scope.

ANSWER: Mississippian culture

9. Joseph Priestley wrote a pamphlet correcting this thinker's grammar and history and attacking his views on Dissenters. Another critic of this philosopher coined the phrase "nonsense on stilts" to describe his theories and criticized him for his reliance on so-called "fictions." This thinker formulated the principle that "It is better that ten guilty persons escape than that one innocent suffer." His magnum opus comprises the four sections "The (*) Rights of Persons," "The Rights of Things," "Of Private Wrongs," and "Of Public Wrongs." Jeremy Bentham excoriated this thinker's defense of natural law in his *Fragment on Government*. For 10 points, name this author of the *Commentaries on the Laws of England*.

ANSWER: Sir William Blackstone

10. When a drunk heckler requested this song at an Atlas Sound concert, Bradford Cox proceeded to play it for an hour and told the heckler to strip to his underwear. "Weird Al" Yankovic's breakout song on Dr. Demento, before "Another One Rides the Bus," was a parody of this song. The follow-up to this single was "Good Girls Don't." Its main riff was written by Berton Averre, and its lyrics were written by lead singer Doug (*) Fieger about his girlfriend. This song's singer asks "Is it just a matter of time?" and "Is it destiny or is it just a game in my mind?" Its singer tells the title woman "you make my motor run" and declares "I always get it up for the touch of the younger kind." For 10 points, name this biggest hit for The Knack.

ANSWER: "My Sharona"

11. This ethnic group's culture is celebrated in the largest street festival in Europe, a three-day carnival in early August. The Scarman Report blamed "Operation Swamp" for targeting these people with disproportionate use of the "sus law." In 1981, a misunderstanding over the treatment of Michael Bailey catalyzed a riot among this community that Margaret (*) Thatcher claimed "nothing" could justify. The beginning of the migration of this ethnic group is usually marked by the arrival of the *Empire Windrush*. "Jungle" and "dancehall" music were popularized by this ethnic minority, which fought police in the Brixton riots. For 10 points, name this racial minority in the UK from the West Indies.

ANSWER: Jamaican British [or Afro-Caribbean British people; or equivalents]

12. Six's technique was used to create this sort of artwork, which John Beazley was an expert on. An artist who created this type of artwork is nicknamed Elbows Out because of the unusual anatomy of his dancing figures, and belonged to a pre-Renaissance group called the Mannerists. The Marine Style of this type of artwork is exemplified by one depicting an octopus. An early style of this artwork was the (*) Protogeometric style. Many of these artworks depict the labors of Heracles, and they can be found on objects like *kraters* and *amphorae*. These artworks are called "bilingual" when they use both black-figure and red-figure styles. For 10 points, name this type of ancient Greek artwork found on a certain kind of pottery.

ANSWER: ancient Greek vase paintings [or: anything mentioning painting on pottery]

13. This poem calls New York "a logarithm of other cities" in its fifth stanza, which describes Rome, Vienna, and New York upon claiming "the shadow of the city injects its own urgency." Its speaker compares a hand to a "dozing whale on the sea bottom in relation to the tiny, self-important ship on the surface." The speaker of this poem notes that "each part of the whole falls off and cannot know it knew, except here and there, in cold pockets of remembrance, whispers out of time." Its first stanza claims that (*) "Pope Clement and his court were 'stupefied' by it" after noting "the glass chose to reflect only what he saw." For 10 points, name this John Ashbery poem which opens "As Parmigianino did it, the right hand bigger than the head, thrust at the viewer."

ANSWER: "Self-Portrait in a Convex Mirror"

14. **Yuri Boykov and Vladimir Kolmogorov elucidated a new algorithm for determining this condition, with application to energy minimization in computer-vision problems. An algorithm for finding this condition performs a push operation until there is no admissible arc, then does a relabel operation. Another algorithm for finding this condition maintains a scaling parameter and requires integer capacities for a good runtime. Dinic's algorithm determines this condition by finding paths that entirely consist of (*) saturated arcs. This condition is met when the residual network has no augmenting paths, a property exploited by the Ford-Fulkerson algorithm for finding this condition. For 10 points, name this condition that, according to a famous theorem, is equivalent to a min cut.**

ANSWER: **max flow** [or: **maximum flow**; until it is read, accept: **min cut**, **minimum cut**]

15. **This character rescues the priest Dares' son Idaios from Diomedes because Dares already lost his son Phegeus. This character ends a quarrel among the gods at the end of Book I of the *Iliad* when all the gods cease their fighting to laugh at him. Homer unusually claims that this god's spouse was the grace Aglaea, or Charis. In the *Odyssey*, Demodocus tells the story of a trick played by this god to (*) entrap two other gods in the middle of sex. A gift from this god juxtaposes the images of a city at peace and a city under siege. His most epic moment in Homer comes when he strangles the river Scamander to rescue Achilles. Because the nymph Thetis raised him on Lemnos, he gifts her son Achilles a new set of armor. For 10 points, name this deformed smith for the Olympian gods.**

ANSWER: **Hephaestus**

16. **For a given target, MacAdam ellipses define zones of Gaussian standard deviations around which this quality is indistinguishable. The R9 value extends an index named for this quality. The 1976 version of a diagram depicting this quality transformed the more commonly used 1931 version from X-Y-Z coordinates to L-u-v coordinates. Iso lines for this quality are perpendicular to Planckian loci on those diagrams, published by the CIE. A namesake (*) rendering index quantifies how well a light source reproduces this quality, as compared to blackbody emission. The Kelvin temperature of a light source is more commonly known as this quality's temperature. Popular specifications of this quality include HSV, CMYK, and RGB. For 10 points, name this quality that humans see at specific wavelengths of visible light.**

ANSWER: **color** [or: **chromaticity**, correlated **color** temperature]

17. **This instrument introduces the French mountain air in Vincent d'Indy's *Symphony on a French Mountain Air*. This instrument plays the main melody of the second movement of Franck's *Symphony in D Minor*. Haydn's *Symphony No. 22* is scored for two French horns, strings, and two of these instruments. In the "Scene in the Fields" movement of Berlioz's *Symphonie fantastique*, an (*) oboe and one of these instruments represent a dialogue between two shepherds. This instrument represents the title animal in Sibelius' *Swan of Tuonela*, and plays a solo in the second movement of the *New World Symphony*. For 10 points, name this woodwind instrument sometimes called the cor anglais.**

ANSWER: **English horn** [until it is read, accept: **cor anglais**; do not accept or prompt on: "horn"]

18. A politician from this state described his taxpayer-funded trips to Africa as “a Jesus thing.” Measures from thirty-five bills blocked by a politician from this state were combined into the Advancing America’s Priorities Act by Harry Reid. This state is home to a Congressman who released a report criticizing the National Science Foundation for conducting wasteful studies. This state’s governor, who approved the botched lethal injection that failed to kill Clayton Lockett in 2011, is (*) Mary Fallin. Lawmakers in this state seek to cut funding for AP U.S. History courses for overly emphasizing negative aspects of American history. This is the home state of a senator who noted that it was “very unseasonable” when he presented a snowball to the Senate floor. For 10 points, name this state whose politicians include the Chairman of the Senate Environment Committee, Jim Inhofe, and the ultra-conservative Tom Coburn.

ANSWER: Oklahoma

19. This speech personifies war as a man who “capers nimbly in a lady’s chamber to the lascivious pleasing of a lute” and as a “grim-visaged” man who “hath smooth’d his wrinkled front.” The arrival of another character prompts the deliverer of this speech to say “Dive, thoughts, down to my soul.” The deliverer of this speech laments that he is (*) “rudely stamp’d” and that dogs bark at him when he stops by them, and since his deformity means that he “cannot prove a lover,” he is “determined to prove a villain” by setting Clarence and the king against each other. This speech begins by mentioning a time period which is “made glorious summer by this sun of York.” For 10 points, name this soliloquy by Gloucester which opens Shakespeare’s *Richard III*.

ANSWER: “Now is the winter of our discontent” [*prompt on*: anything indicating that it’s Gloucester’s speech at the beginning of *Richard III*]

20. Juan Pio Paiva and his son were arrested for deliberately preventing people from fleeing a fire at one of these places in Paraguay in 2004. One of these places was attacked during the International Day of Peace in retaliation for Operation Linda Nchi. Another of these places was erected by the Sampoong Group over a landfill in Seoul, but eventually collapsed in the deadliest modern-day structural failure before the September 11th attacks. Plans to construct one of these places at the site of a former barracks in (*) Taksim Gezi Park led Turkish protesters to adopt the slogan “Everyday I’m chapulling.” Uhuru Kenyatta’s security forces helped stop a 2013 attack on one of these places perpetrated by al-Shabaab. For 10 points, name these places that include Westgate in Nairobi, Kenya.

ANSWER: shopping malls [*or*: obvious equivalents, such as supermarkets]

1. In one appearance, this character complains “back window’s cracked, kitchen floor squeaks, there’s rats in the cellar, and the attic leaks.” For 10 points each:

[10] Name this character whose encounters with the “Phone Bill,” “the Minister,” the “Census Man” and the “Rent Man” are relayed in a series of poems.

ANSWER: **Madam**

[10] Madam was created by this Harlem Renaissance poet of “The Weary Blues” and “A Negro Speaks of Rivers.”

ANSWER: Langston **Hughes**

[10] One of the title characters of this Hughes poem tells the other “Life for me ain’t been no crystal stair.”

ANSWER: “**Mother to Son**”

2. This giant shares his name with the hero of an Irish narrative who sails to the Land of Women in the Other World. For 10 points each:

[10] Name this Welsh giant fatally wounded in a battle against King Matholwch, after which he asks that his head be buried in the direction of France to protect Britain from invasion.

ANSWER: **Bran** the Blessed [or **Bendigeidfran**]

[10] The narrative of the voyage of Bran inspired the 8th-century tale of this Irish Christian knight. After disobeying a druid by taking his three foster brothers onto his ship, he veers off course to islands full of ants, fire people, and shapeshifting beasts.

ANSWER: **Mael Duin**

[10] The Celtic narratives of Bran and Mael Duin share aspects of the story of this Greek hero, who visited the Laestrygonians and Cyclopes.

ANSWER: **Odysseus** [or **Ulysses**]

3. The Lorenz gauge fixes the divergence of this quantity plus one over c -squared times the partial time derivative of the electric potential to zero. For 10 points each:

[10] Name this quantity whose curl is defined as the magnetic field.

ANSWER: **A** [or: **magnetic** vector **potential**]

[10] Covariant formulations of Maxwell’s equations require two four-vectors: one is the magnetic potential and scalar potential while the other is a combination of these two quantities. The Lorentz invariant 4-divergence of the four-vector formed by these two quantities is an expression of charge conservation.

ANSWER: **current density** and **charge density** [or: **current density** and **proper** charge **density**, **j** and **rho**]

[10] Classically, charge conservation is expressed as the divergence of current density plus partial time derivative of charge density being zero, which is an example of what type of general equation that expresses a local conservation law for some quantity.

ANSWER: **continuity** equation

4. In Barbegal, France, one of these conduits powered two sets of eight flour-grinding wheels built into the hillside. For 10 points each:

[10] Name these Roman feats of engineering discussed heavily in a treatise by Frontinus. These conduits used gravity to transport water from faraway springs into Rome and other major cities.

ANSWER: **aqueducts**

[10] Rome was able to make its aqueducts waterproof thanks to its invention of concrete, whose secret ingredient, *pozzolana*, was this type of material. The “Ring Lady” was found inside of this material.

ANSWER: volcanic **ash**

[10] Rome made extensive use of aqueducts in the operation of one of these sites at Dolaucothi in Wales. Seven aqueducts were used in the *ruina montium* process at one of these sites at Las Medulas in Spain.

ANSWER: **gold mines** [prompt on: “**mines**”]

5. A man of this profession, Don Diego de Acedo, is shown flipping the pages of a book almost as big as himself. For 10 points each:

[10] Name this profession whose members, such as Sebastián de Morra and Francisco Lezcano, were often painted sitting down. Another painting depicts a member of this profession nicknamed Don John of Austria.

ANSWER: court **jesters**

[10] Those portraits of jesters are by Diego Velázquez, who painted more regal members of Philip IV’s court in this painting. Velázquez himself appears in front of a large canvas in this painting.

ANSWER: *Las* **Meninas** [or: *The* **Maids of Honor**]

[10] Some of the jesters painted by Velázquez were also this kind of person. Other examples of this kind of person painted by Velázquez include Maribarbola and one who is shown hanging out with Prince Balthasar Charles.

ANSWER: **dwarves** [or: **little people**, **midgets**]

6. Carlos Quentin was suspended for eight games after sparking a bench clearing brawl by charging the mound against this pitcher, who in 2012 became the first pitcher in almost 90 years to start three games in a row. For 10 points each:

[10] Name this pitcher who won the AL Cy Young award in 2009 while pitching for the Kansas City Royals.

ANSWER: Zack **Greinke**

[10] Greinke currently pitches for this team, which is managed by Don Mattingly and also employs Clayton Kershaw and Adrian Gonzalez.

ANSWER: Los Angeles **Dodgers** [prompt on: “Los Angeles”]

[10] In 2015, Greinke’s forty-five and two thirds inning scoreless streak was ended when this Mets starting pitcher grounded into a fielder’s choice. After the 2012 season, he broke his finger while castrating a calf.

ANSWER: Jacob **de Grom**

7. Answer the following about literary characters who plan to blow up buildings, for 10 points each.

[10] Verloc is tasked with blowing up the Greenwich Observatory in *The Secret Agent*, a novel by this Polish/British author of *Lord Jim*.

ANSWER: Joseph **Conrad** [or: Jozef Teodor Konrad **Korzeniowski**]

[10] Alice joins a terrorist group and takes part in a failed plot to blow up a hotel in this author’s novel *The Good Terrorist*.

ANSWER: Doris (May) **Lessing** [or: Doris May **Taylor**]

[10] The original version of this Peter Shaffer play ends with the title character and Lotte Schoen planning to blow up a bunch of ugly modern buildings with a petard.

ANSWER: **Letkice and Lovage**

8. The short-lived Wassoulou Empire, which fought against the French in the late 19th century, spoke the language of this ethnic group. For 10 points each:

[10] Name this major West African ethnic group whose members include the first President of Guinea, Ahmed Sékou Touré. Griots from this ethnic group often tell stories of their hero, Sundiata.

ANSWER: **Mandinka** people [or: **Malinke**, **Mandingo**; prompt on: "**Mandé**"]

[10] Many Mandinka converted to Islam after several of these conflicts that took place throughout the 17th, 18th, and 19th centuries. These conflicts were responsible for the foundation of Fouta Djallon and the Sokoto Caliphate.

ANSWER: **Fulani jihads** [or: equivalents that mention **Fula** or **Fulani**; prompt on: "**jihads**"]

[10] The territory of the Sokoto Caliphate lies in this large present-day country, whose Oyo Empire was founded by the Yoruba.

ANSWER: **Nigeria** [do not accept: "Niger"]

9. This mystic famously declared "I am the Truth," prompting allegations that he claimed to be divine. For 10 points each:

[10] Name this mystic who was crucified by the Abbasid Caliph Al-Muqtadir in 922.

ANSWER: Mansur **al-Hallaj**

[10] Mansur al-Hallaj belonged to this tradition of Islamic mysticism that is manifested in the whirling of the Mevlevis and the poetry of Rumi.

ANSWER: **Sufi**

[10] One of the main ways that Sufis demonstrate their devotion is through this rhythmic repetition of the name of Allah.

ANSWER: **dhikr**

10. Precursor proteins to acid hydrolases are tagged with mannose-6-phosphate by the Golgi, so they can be transported to this organelle. For 10 points each:

[10] Name these waste disposal organelles.

ANSWER: **lysosomes**

[10] In order for a soluble protein—especially chaperones—to proceed from the endoplasmic reticulum to the Golgi, this retrieval sequence must be cleaved from the C-terminus. It differs from the KKXX sequence found on ER membrane proteins.

ANSWER: **KDEL** [or: **lys-asp-glu-leu**, **lysine-aspartic acid-glutamic acid-leucine**, **HDEL**, **his-asp-glu-leu**, **histidine-aspartic acid-glutamic acid-leucine**]

[10] This protein covers vesicles involved in retrograde transport, from the *cis*-Golgi to the ER, thus mediating ER retrieval. This protein is recruited by vesicles with membrane-bound ARF-GTP complexes.

ANSWER: **COPI** ("cop one") [or: **coat protein I**, prompt on: "**COP**", "**coat protein**"]

11. Answer the following related to the poetry of Paul Verlaine, for 10 points each.

[10] This third movement of Claude Debussy's *Suite bergamasque* is named for a Paul Verlaine poem about moonlight.

ANSWER: "**Clair de lune**"

[10] Paul Verlaine produced the librettos to this composer's two early operettas, *Vaucochard et fils Ier* and *Fisch-Ton-Kan*. Poulenc claimed that his *Dix pièces pittoresques* were "as important for French music as Debussy's *Préludes*."

ANSWER: Emmanuel **Chabrier** [or: Alexis Emmanuel **Chabrier**]

[10] This French pedagogue based her songs *Soleils couchants* on Verlaine's poetry. She mentored a frankly insane number of 20th century composers.

ANSWER: Nadia **Boulanger** [or: Juliette Nadia **Boulanger**]

12. Before taking the throne, Dagobert II underwent this punishment. For 10 points each:

[10] Name this practice of cutting all the hair off one's scalp, often used by the Merovingians to mark pretenders unfit for kingship.

ANSWER: **tonsure**

[10] The last Merovingian king, Childeric III, was tonsured after this pope helped overthrow him.

ANSWER: **Zachary**

[10] This king, who helped out the Papal States against the Lombards through his namesake "Donation," appealed to Pope Zachary during his overthrow of Childeric III.

ANSWER: **Pepin the Short** [or: **Pepin the Younger**; prompt on: "**Pepin**"]

13. This poem complains about a litany of evils, including women participating in boar hunts and the exiled Marius Priscus spending all afternoon drinking. For 10 points each:

[10] Name this programmatic poem, which declares that "it is difficult not to write" works in the genre to which it belongs.

ANSWER: Juvenal's **First Satire** [or: obvious equivalents]

[10] Juvenal's Sixth Satire is the source of a famous quote about who watches these people. That quote provided the title of a graphic novel by Alan Moore.

ANSWER: the **watchmen** [or: the **guards**, *ipsos custodes*]

[10] Juvenal's Twelfth Satire is on this topic. Cicero wrote about Scipio Aemilianus and Laelius in a treatise on this topic.

ANSWER: **friendship** [or: **amicitia**]

14. This type of capillary column was designed to improve the retention of volatile compounds in gas chromatography. For 10 points each:

[10] Name these capillary columns whose inner surface is coated with a solid porous material.

ANSWER: **PLOT** columns [or: **porous layer open tube** columns]

[10] Liquid columns rely on gas-liquid partitioning while PLOT columns rely on a gas undergoing this process with respect to the porous coating. This process can be modeled using the Freundlich, Langmuir, or BET equations.

ANSWER: **adsorption** [do not accept: "absorption"]

[10] The first PLOT columns used a coating of this compound. This compound is produced from bauxite in the Bayer process.

ANSWER: **Al₂O₃** [or: **aluminum oxide**, **alumina**]

15. Waste from this river contaminated water cribs after an 1885 storm, but did not actually lead to an outbreak of typhoid fever and cholera that killed 90,000 people. For 10 points each:

[10] Name this river linked to the Des Plaines River by a Sanitary and Ship Canal, which contains an electric barrier to keep Asian carp out of the Great Lakes. This river is dyed green on St. Patrick's Day.

ANSWER: **Chicago** River

[10] The Chicago River has this unique trait, thanks to a massive canal project undertaken in response to the aforementioned 1885 storm.

ANSWER: it **flows in reverse** [or: equivalents for "reverse," such as **backwards** or **away from Lake Michigan**]

[10] This ship turned over while docked in the Chicago River, killing over 800 passengers, 200 of whom were Czech immigrants, in what became the deadliest shipwreck in the Great Lakes.

ANSWER: SS **Eastland**

16. The two word name from this policy comes from Edmund Burke's 1775 "Speech on Conciliation with America." For 10 points each:

[10] Give this name for the policy of non-interference and lax oversight in the relationship between England and the American colonies in the 17th and early 18th century.

ANSWER: **salutary neglect**

[10] One of the effects of salutary neglect was the general lack of enforcement of this protectionist series of acts, which began in 1651 and sought to direct the benefits of trade to England from its colonies.

ANSWER: **Navigation** Acts

[10] Salutary neglect was definitely over by the time this 1765 act was passed. It taxed land grants, attorney licenses, newspapers, and playing cards.

ANSWER: **Stamp** Act

17. This type of synthesized speech was developed by Philip Rubin at Haskins Laboratories. For 10 points each:

[10] Name this type of synthesized speech which can be recognized by some listeners despite not including any of the distinctive phonetic properties of speech except for the frequency and amplitude pattern of the resonance peaks.

ANSWER: **sine-wave** speech

[10] In this effect, playing a recording of one sound over a video of someone producing another sound tricks the listener into hearing the wrong sound.

ANSWER: **McGurk** effect

[10] When presented with a continuum of productions of this type of consonant, listeners perceive a categorical distinction, not a continuum. As their name indicates, these consonants involve complete closure of the vocal tract.

ANSWER: oral **stop** consonants [or: **plosives**, oral **occlusives**; *do not accept*: "nasal stops"]

18. With a great deal of generality, a volume of rock undergoing metamorphism follows a clockwise path in this space. For 10 points each:

[10] Name this space that can be divided into distinct regions of metamorphic facies.

ANSWER: **P-T-t** space [or: **pressure-temperature-time** space]

[10] This ultra-important Finnish petrologist developed the theory of metamorphic facies. Much of his success in modeling metamorphic rocks was due to his development and use of the ACF diagram.

ANSWER: Pentti **Eskola**

[10] Eclogite facies are formed in ultra-high pressure and temperatures regimes, most typically when this mafic rock or gabbro, its intrusive equivalent, undergo subduction.

ANSWER: **basalt**

19. Ibn al-Nafis, who described the pulmonary circulation of the blood centuries before Harvey, wrote a theological novel about Kamil, who grows up in this sort of location. For 10 points each:

[10] Name this type of location, which is also the setting of Ibn Tufail's philosophical novel *The Improvement of Human Reason*.

ANSWER: a desert **island**

[10] *The Improvement of Human Reason* is about a child who is raised by a gazelle. Another fictional character raised by animals is Enkidu, who befriends this hero of a namesake epic.

ANSWER: **Gilgamesh**

[10] In the *Shahnameh*, this father of Rostam is raised by the Simurgh, which gave him three feathers to burn in case he was ever in trouble.

ANSWER: **Zal**

20. This choreographer is the subject of Catherine Gund's documentary *BORN TO FLY*. For 10 points each:

[10] Name this contemporary dancer and choreographer known for having her dancers flung into walls, intentionally dropped from great heights, and smashed into Plexiglass panels.

ANSWER: Elizabeth **Streb**

[10] This much more conventional choreographer is best known for his Tony award winning choreography for musicals like *Gypsy*, *Fiddler on the Roof*, and *West Side Story*.

ANSWER: Jerome **Robbins**

[10] This dancer reshaped modern dance with her namesake technique in addition to choreographing *Appalachian Spring*.

ANSWER: Martha **Graham**