

2016 Terrapin XXIX: Lead Can't Penetrate Steele

Packet 7

Edited by Jordan Brownstein and Billy Busse

Questions by Jordan Brownstein, Billy Busse, Weijia Cheng, Naveed Chowdhury, Justin Hawkins, Will Kunkel, Ophir Lifshitz, Ani Perumalla, Sam Rombro, Jason Shi, Emma Stevens, Tanay Wakhare, and Sarang Yeola

Tossups

1. **Heath's theorem can be used to decompose certain components of these entities if those components satisfy a functional dependency. These entities can be used for OLAP if they are designed with a star schema. Edgar F. Codd proposed a model for these entities, and with Raymond F. Boyce, he is the namesake of a normal form of these entities. Boyce and Chamberlin invented an English-like language for these entities. Jim Grey identified (*) atomicity, consistency, isolation, and durability, or ACID, as four important properties of transactions in these entities. In a language used to manipulate these entities, one can use the JOIN clause to combine rows from two or more tables. In that same language, one can use a SELECT statement to query the "relational" type of these entities. For 10 points, SQL is used to manipulate what computerized collections of information?**

ANSWER: relational databases [do not accept or prompt on "tables" or "spreadsheets"]

<WC Other Science (Computer Science)>

2. **This composer separated vowels with z's in "Three lovely birds from paradise" for chorus. He elided silent e's in setting 5 animal fables in *Natural Histories*, angering listeners. This composer used a trio in *Madagascan Songs*. He used an orchestra to set free verse Tristan Klingsor poems in *Shéhérazade*. He used melismas over a pedal on G in his *Kaddisch*. Dancers with tambourines said "Ser-gei Dia-ghi-lev" to keep 5/4 time in the final bacchanale or (*) *danse générale* in his only Ballets Russes work. Flutes depict a pantomimed myth, and wordless chorus, flute, clarinet, and harp glissandi depict sunrise over shepherds, in that ballet by this composer of *La valse*. Until the E major climax, two C major themes alternate among instruments over a crescendo snare drum ostinato in a piece by him. For 10 points, name this composer of *Daphnis et Chloé* and *Boléro*.**

ANSWER: Maurice Ravel

<OL Music>

3. **This monarch had noblewomen sent to convents if a police squad called the Chastity Commission caught them acting immorally. Wolfgang von Kempelen built his fake chess-playing automaton, the Turk, to entertain this monarch. This ruler issued a namesake *Nemesis*, an illustrated guide to punishing criminals, but later agreed to abolish torture due to the influence of the physician and university reformer Gerard van Swieten. This monarch limited mandatory labor for (*) peasants to three days a week via the Robot Patent. This monarch's minister Kaunitz orchestrated a surprising alliance with France in the Diplomatic Revolution. This successor of Charles VI lost Silesia after Frederick II invaded it to dispute her right to rule. For 10 points, name this mother of Joseph II, a Habsburg queen whose succession was allowed by the Pragmatic Sanction.**

ANSWER: Maria Theresa [prompt on partial answer]

<JB European History>

4. Another author's 2009 response to a book by this author repeatedly uses the example of three children quarreling over a flute. This thinker's lack of attention to the family was criticized by Susan Moller Okin. Amartya Sen, a student of this thinker, wrote a book about the "idea" of the topic of one of his books. This man's conception of the individual was criticized from a communitarian standpoint by Michael Sandel, the creator of a popular (*) course on this man's best-known subject. A response to this thinker argues that it is not unfair for a million people to pay 25 cents to see Wilt Chamberlain play. That response argues for a "night watchman state" and is Robert Nozick's *Anarchy, State, and Utopia*. For 10 points, name this philosopher whose critics usually discuss the veil of ignorance thought experiment put forth in his *A Theory of Justice*.

ANSWER: John Rawls

<JB Philosophy>

5. Deficiency of this vitamin can lead to a buildup of keratin called Bitot's spots. Derivatives of this vitamin can be used to treat harlequin-type ichthyosis. Transthyretin transports thyroid protein T4 and a derivative of this vitamin. Ethanol acts as a competitive inhibitor to this vitamin since both are metabolized by the same dehydrogenases. Light causes one form of this vitamin to (*) isomerize from its *cis* form to its *trans* form. To combat deficiency of this vitamin in third world countries, scientists created "golden rice." A derivative of this molecule binds to light-sensitive membrane proteins called opsins. For 10 points, name this fat-soluble vitamin derived from beta-carotene that supports vision.

ANSWER: vitamin A [or retinol; or retinal; or retinoic acid; accept beta-carotene until read]

<SY Biology>

6. Susan Sontag's *Illness as Metaphor* discusses a scene from this play in which a woman claims her obese son is consumptive. Later in this play, that woman is furious to discover that a letter supposedly about cockfighting is actually a request for a fresh pair of horses. A character in this play drives a coach in circles for three hours while pretending to drive to Aunt Pedigree's house. In this play, (*) Constance schemes to obtain a casket of jewels so that she can elope with Hastings. At the Three Pigeons alehouse, Tony Lumpkin tricks two travellers into thinking that this play's mansion setting is an inn, allowing the protagonist to pose as a barmaid. For 10 points, name this play titled for Kate Hardcastle's strategy to marry Charles Marlow, a work of Oliver Goldsmith.

ANSWER: She Stoops to Conquer

<ES British Literature>

7. A book on the culture of this form by John Fiske coined the term "semiotic democracy" to describe the "delegation of the production of meanings." Dominant, negotiated, or oppositional readings can be applied to this medium in the encoding/decoding model proposed by Stuart Hall. The market exercises "invisible censorship" on this medium according to a late work by Pierre Bourdieu. Like (*) phone calls and comics, this medium's low definition makes it a "cool" medium in Marshall McLuhan's classification. Newton Minow dubbed this medium a "vast wasteland" in a speech given as chairman of the FCC. For 10 points, Neil Postman's *Amusing Ourselves to Death* critiques what medium for having its programming determined by audience ratings?

ANSWER: television [or TV; prompt on journalism or news]

<JB Social Science>

8. The German anthropologist Mark Münzel accused this leader of genocide after he ordered the resettlement of the indigenous Aché (“ah-CHAY”) people. This leader’s Department of Investigations was led by a man known for dunking prisoners in tanks filled with human excrement, Pastor Coronel. This leader’s government tortured Martín Alamada, who discovered the Archives of Terror, a collection of documents detailing the activities of this leader’s (*) secret police. This leader, who deposed Federico Chávez after Chávez attempted to arm the national police, was himself deposed by Andrés Rodríguez. His government constructed the Itaipú Dam with Brazil. For 10 points, name this president from the Colorado Party, who ruled Paraguay.

ANSWER: Alfredo Stroessner Matiauda

<WC World History>

9. In a scene set on a beach in this film, the camera pulls back to show a character sitting in shadow with his head on his knees after he doesn’t react to his companion’s mention of the “Peachtree Dance.” In a scene of this film set against a cedar board wall with a bright, cross-shaped window, a man screams “get out of here ghost!” as he slaps a kneeling character. In this film’s almost silent 15-minute opening, its protagonist breaks his leg while (*) prospecting for silver. A famous shot in this film shows the main character sitting staring at a pillar of fire after an explosion deafens his son. This film ends with the protagonist telling his butler “I’m finished” after using a bowling pin to murder the leader of the Church of the Third Revelation, Eli Sunday, whom he had told “I drink your milkshake!” For 10 points, name this Paul Thomas Anderson film about oil tycoon Daniel Plainview.

ANSWER: There Will Be Blood

<JB Other Arts (Film)>

10. In one of these reactions, tributylphosphine and a cyanoselenium compound react with an alcohol to form a selenoxide intermediate. Performing this type of reaction on a carbinolamine yields an imine. Another example of these reactions involves using mCPBA to oxidize a tertiary amine to form an amine oxide, then heating to form the final product. One mechanism for this type of reaction minimizes steric interactions with a staggered transition state, which only forms when the reactive groups are positioned in an (*) antiperiplanar geometry. The regioselectivity of these reactions is predicted by Zaitsev’s rule. These reactions typically involve an alkyl halide reacting with a strong base to form an alkene. Two substituents are removed from a molecule in this type of reaction. For 10 points, what type of reaction takes place via E1 and E2 mechanisms?

ANSWER: elimination [accept Grieco elimination; accept Cope elimination; accept E2 until read, but prompt afterwards; do not accept or prompt on “Cope rearrangement”]

<SR Chemistry>

11. A story by this author follows a couple whose institutionalized son thinks that “everything is a cipher and of everything he is the theme” due to his “referential mania.” In one of his stories, the narrator catches sight of a shadowless icicle and a red-shadowed parking meter; the last paragraph reveals that those sights were caused by the ghosts of Cynthia and Sybil. This author of “Signs and Symbols” describes seeing an old swan trying to climb into a boat at the end of a piece about his Swiss governess. This author of “The (*) Vane Sisters” included “Mademoiselle O” in a memoir that also discusses his love of butterfly-collecting. In a novel by this author, the protagonist shoots the playwright of *The Enchanted Hunters*, Clare Quilty, for kidnapping the title character. For 10 points, name this author of *Speak*, *Memory* and *Lolita*.

ANSWER: Vladimir Nabokov

<JB European Literature>

12. This section of a holy text describes how a man passes by a ruin and asks “How will God bring this to life after its death?”; that man is then killed and revived after a hundred years. It recalls how the angels Harut and Marut declared that “We are a trial, so do not disbelieve,” before teaching people magic. This section of a holy text recalls how the angels were ordered to prostrate before Adam, which Iblis, the Devil, refused to do. An object in this sūrah is said to (*) extend over the heavens and the earth; that object is the subject of the Throne Verse. The namesake of this sūrah is said to be yellow and is neither trained to irrigate the field nor to pull the plow. For 10 points, name this second and longest sūrah in the Qur’an, which describes how Moses told the Israelites to sacrifice a certain animal.

ANSWER: Al-Baqara [or The Cow; or The Heifer; or the second sūrah or equivalents before “second” is read]
<WC Religion>

13. During the Battle of Beroia, members of this military organization hacked through a wagon fort, resulting in a decisive defeat for the Pechenegs. Members of this military organization were probably responsible for creating the inscriptions that deface the Piraeus Lion. The *Alexiad* recounts how Alexios I was advised not to ask the Immortals or this other military organization to (*) betray Nikephoros III. This military organization was initially formed after Basil II received military aid from Vladimir of Kiev. Harald Hardrada served in this military organization before taking the throne of Norway. For 10 points, name this Byzantine military organization, which was responsible for acting as the emperor’s bodyguards and heavily recruited warriors from Scandinavia.

ANSWER: Varangian Guard [or Varangians; prompt on Byzantine military or equivalents]
<WC European History>

14. A version of this play adds an argument with a nurse over the dog Puff and a woman who sits knitting sweaters throughout the play before going to her room to kill herself. Upon entering, a character in this play gives a speech beginning “My countrymen, the ship of state is safe.” In this play, a sentry describes seeing a mysterious whirlwind, and then catching sight of the (*) protagonist after the dust settles. In both this play and the update of it written by Jean Anouilh (“ah-NOO-ee”) during the Vichy regime, Haemon stabs himself after finding the hanging body of the protagonist in a cavelike tomb. In this play, Ismene’s sister violates the orders of Creon by performing burial rites for Polyneices. For 10 points, name this Sophocles play titled for the daughter of Oedipus.

ANSWER: Antigone
<JB Other Literature>

15. For a spin glass, the natural logarithm of this quantity can be computed using the replica trick. For an N -site one-dimensional Ising model, this quantity can be calculated via the trace of the product of N transfer matrices. The derivative of the natural logarithm of this quantity with respect to beta gives the expectation value of a system’s energy. In the canonical ensemble, the (*) Helmholtz free energy is calculated as negative kT times the natural logarithm of this quantity, which is given as the sum over all microstates of e to the negative beta times the energy of the microstate. For 10 points, name this normalization constant for the Boltzmann distribution, an important thermodynamic quantity symbolized Z .

ANSWER: partition function [accept Z until read]
<SR Physics>

16. A man from this non-Jamaica colony kept a repetitive, coded diary that details his “rogering” of various women and the whippings he gave his slaves. In this colony, black property owner Anthony Johnson won a suit to keep John Casor as his slave for life, paralleling this colony’s earlier case involving John Punch. A governor of this colony used a flotilla of smallpox-infected ships to house his Ethiopian Regiment, which he’d formed via a (*) proclamation promising freedom to slaves who joined. Slavery gained popularity in this colony after a man issued the “Declaration of the People” and burned down the capital before dying of dysentery. This colony home to William Byrd was governed by Lord Dunmore and William Berkeley. For 10 points, slaves harvested tobacco in what colony where Nathaniel Bacon burned down Jamestown?

ANSWER: Virginia

<JB American History>

17. Yinka Shonibare used his characteristic mannequins to reproduce two subjects of this artist “without their heads.” He’s not Gorky, but a woman in that painting by this artist was described as “part of the landscape” in a work of geography by Gillian Rose and has an unpainted area around the hands in her lap. Two men fight over a flask on the back of a cart on a country road in the first of two paintings by this artist titled *The Harvest Wagon*. In a (*) portrait by this artist, a dog looks up at a rifle held in the crook of the arm of a man who leans against the bench his wife sits on, to the left of pastoral green fields. A painting by this artist is displayed opposite Thomas Lawrence’s *Pinkie* and depicts Jonathan Buttall in 17th-century royal dress. For 10 points, name this artist of *Mr. and Mrs. Andrews* and *The Blue Boy*.

ANSWER: Thomas Gainsborough (“GAINS-bruh”)

<JB Painting>

18. “Sing we love and idleness / Naught else is worth having” opens a work by this poet that also describes “high deeds in Hungary.” Images in a poem by this poet include the “Sleek head, daughter of Lir, / eyes of Picasso,” and that poem opens with the command “Hang it all, Robert Browning!” This poet described “Limbs that we left in the house of Circe” in a poem that begins with the line “And (*) then went down to the ship.” The title character of a poem by this poet “walked eye-deep in hell” and “strove to resuscitate the dead art / of poetry.” A short poem by this author describes “The apparition of these faces in the crowd; / Petals on a wet, black bough.” For 10 points, name this American poet of “Hugh Selwyn Mauberley,” “In a Station of the Metro,” and *The Cantos*.

ANSWER: Ezra Weston Loomis Pound

<ES American Literature>

19. An ape-like cryptid from this country is said to inhabit the area near Springbrook Mountain. The Centurion tree is the tallest specimen of the world’s tallest flowering plant, which is native to this country. John King was the only survivor of the Burke and Wills expedition, which explored this country. Meat ants and cricket bats are often used to kill an invasive species to this country, (*) the cane toad. Tourists to this country are often convinced to stick forks into their hair to defend against “drop bear” attacks. An animal native to this country is said to sit “in the old gum tree” in a common children’s rhyme. The thylacine was native to an island in this country originally named Van Diemen’s Land and whose apex predator was its namesake “devil.” For 10 points, name this home country of the laughing kookaburra and kangaroo.

ANSWER: Australia

<AP Other (Geography)>

20. Robert Calasso's book on Greek myth is titled for the marriage of this man and his wife, at whose wedding Demeter and Iasion got drunk and had sex. He's not Pan, but some accounts credit this mortal with stealing Zeus's sinews back from Delphyne, or distracting Typhon with music to allow Zeus to defeat him. An object owned by this man's wife was used to bribe Eriphyle to convince her husband to join Polynices.

Herodotus credits this man with introducing an (*) alphabet to Greece. This man's father Agenor sent him and his brothers Phoenix, Cilus, and Thasus to search for their sister. This husband of Harmonia created the Spartoi by sowing some dragon's teeth, and, while searching for Europa, he followed a cow to the site of the Boeotian ("bee-OH-shin") city he would found. For 10 points, name this mythical founder of Thebes.

ANSWER: Cadmus [or Kadmos]

<JB Mythology>

Bonuses

1. The ballet *Études*, which uses music by Carl Czerny (“CHAIR-nee”), was choreographed by Harald Lander of this country. For 10 points each:

[10] Name this country home to one of the oldest ballet schools in the world, after Paris and St. Petersburg. Its Royal Ballet has been directed by August Bournonville, Vincenzo Galeotti, and Kaj Smith.

ANSWER: **Denmark** [accept **Royal Danish Ballet**]

[10] Bournonville choreographed this oldest surviving ballet about a farmer and forest spirit. Glazunov orchestrated music by Chopin for a similarly titled ballet choreographed by Michel Fokine for the Ballets Russes. Name either.

ANSWER: *La Sylphide* OR *Les Sylphides* [accept *The Sylph* or *Sylfiden*]

[10] After Bournonville’s *La Sylphide* used this technique for a floating effect, other ballets began to feature it more. In this technique, a dancer supports her body on her toes and wears special shoes stuffed with a hard box at the tip.

ANSWER: en **pointe**

<OL Other Arts (Dance)>

2. The creation of this institution was preceded by a 1920 report produced by Lord Dawson. For 10 points each:

[10] Name this institution that was created by Aneurin Bevan in 1946 during the Labour government of Clement Attlee. This institution is responsible for providing healthcare at nearly no cost to the patient in the United Kingdom.

ANSWER: **National Health Service**

[10] Before the NHS was created, the National Insurance Act was passed under this Liberal prime minister to create a health insurance system. As Chancellor of the Exchequer, he had previously pushed through the People’s Budget.

ANSWER: David **Lloyd George** [do not accept or prompt on “George”]

[10] As the Minister of Health, this politician challenged the NHS to improve psychiatric treatment in his “Water Tower” speech. This man was dismissed from Heath’s shadow cabinet for a speech criticizing immigration policies.

ANSWER: John Enoch **Powell**

<WC European History>

3. Muon spin rotation spectroscopy can be used to measure this quantity. For 10 points each:

[10] Name this quantity, which characterizes the exponential decay in the solution to the equation [read slowly] “del cross current density equals the negative number density times electron charge squared times magnetic field divided by mass.”

ANSWER: London **penetration depth** [or **magnetic penetration depth**]

[10] The London penetration depth characterizes these materials, which have zero resistance when cooled below their critical temperature.

ANSWER: **superconductors**

[10] The London penetration depth can be derived from London’s second equation by combining it with this law, then using the curl-of-the-curl identity to obtain an equation in terms of only the B-field and constants. This law states that the curl of the magnetic field is proportional to the current density.

ANSWER: **Ampère**’s law

<SR Physics>

4. Chinweizu, Jemie, and Madubuike wrote an essay titled “Towards” this goal for “African Literature.” For 10 points each:

[10] Name this process. It also partly titles an essay in which the author explains his decision to write *I Will Marry When I Want* in Gikūyū.

ANSWER: decolonisation [or Decolonising the Mind]

[10] In “Decolonising the Mind,” Ngũgĩ wa Thiong’o renounced writing in this language, the use of which in Africa he called a “cultural bomb.” Alan Paton’s *Cry, the Beloved Country* was written in this language.

ANSWER: English

[10] This author referred to the authors of “Towards the Decolonization of African Literature” as the “troika” in his response, “Neo-Tarzanism.” This Nobel laureate’s memoirs include *Aké: The Years of Childhood* and prison notes entitled *The Man Died*.

ANSWER: Wole Soyinka (“WALL-ay SHOW-ying-ka”)

<JB Other Literature>

5. The sender of this message proclaimed Soviet Communism as “undoubtedly the greatest task our diplomacy has ever faced and probably the greatest it will ever have to face.” For 10 points each:

[10] Name this message sent from Moscow to James Byrnes under the pseudonym “Mr. X,” which put forth the idea of “containing” the Soviet Union’s influence.

ANSWER: Long Telegram [accept “The Sources of Soviet Conduct”; prompt on X Article]

[10] James Byrnes served in this position under Harry Truman, and was succeeded by George Marshall, who was succeeded by Dean Acheson, who was succeeded by John Foster Dulles.

ANSWER: United States Secretary of State

[10] Kennan obtained permission from this man to publish the Long Telegram publicly, with “Mr. X” as its author. Two months after Truman asked this first Secretary of Defense to resign, he died in peculiar circumstances after jumping out of a window in a clinic.

ANSWER: James Forrestal

<AP American History>

6. Near the end of an essay in *Patterns of Intention*, Michael Baxandall offhandedly notes that this artist’s *Lady Taking Tea* probably depicts his dying wife. For 10 points each:

[10] Name this 18th-century artist who depicted boys engaged in activities such as spinning tops, building houses of cards, and blowing bubbles.

ANSWER: Jean-Baptiste-Siméon Chardin (“shar-DANN”)

[10] Chardin is best known for works in this genre such as *The Ray* and *The Silver Goblet*. Paintings of this genre depict arrangements of inanimate objects.

ANSWER: still lifes

[10] Chardin painted a woman holding one of these objects while a man lights a candle. A maid brings one of these things to her cittern-playing mistress in a painting by Vermeer, who also depicted a pregnant woman in blue holding one.

ANSWER: letters [or love letters; or equivalents such as missives; prompt on papers]

<JB Painting>

7. Answer the following about maidens who were menaced by sea monsters in Greek mythology, for 10 points each.

[10] Perseus killed the sea-monster to whom this Ethiopian princess was to be sacrificed. Poseidon had sent the monster because her mother, Cassiopeia, boasted that this woman's beauty exceeded that of the Nereids.

ANSWER: **Andromeda**

[10] This founder of Troy cheated Apollo and Poseidon out of payment for building the walls of Troy, prompting Poseidon to send a sea-monster that this man tried to appease by sacrificing his daughter Hesione to it.

ANSWER: **Laomedon**

[10] This brother of Peleus sacked Troy with Heracles, after which Heracles gave Hesione as a wife to him. Hesione bore Teucer the archer to this man before escaping to Asia Minor.

ANSWER: **Telamon**

<JS Mythology>

8. These characters title an author's third story about Michael Robartes and Owen Aherne. For 10 points each:

[10] Name these men who, in a poem by that author, wear "stiff, painted clothes" and have "ancient faces like rain-beaten stones." At the end of a T. S. Eliot poem, one of them says he is "no longer at ease... With an alien people clutching their gods."

ANSWER: the **Magi** [or Three **Wise Men**; or "The Adoration of the **Magi**"; or "The Journey of the **Magi**"; prompt on **kings** or **Persians**]

[10] This Irish poet, who quoted from his poem "The Magi" in his occult treatise *A Vision*, revisited its somewhat apocalyptic themes in "The Second Coming."

ANSWER: William Butler **Yeats**

[10] Helen Vendler contrasted the Magi's lack of satisfaction with the "tragic joy" of the "three Chinamen" carved onto the title substance of this later Yeats poem.

ANSWER: **"Lapis Lazuli"**

<JB British Literature>

9. Graham's law says that the rate of this process is inversely proportional to the square root of the molar mass of its particles. For 10 points each:

[10] Name this process similar to diffusion by which a gas escapes a container through a small hole.

ANSWER: **effusion**

[10] In effusion, rather than diffusion, the diameter of the hole must be smaller than this value, the average velocity over the collision frequency. Kinetic theory and a hard-sphere approximation predicts that this quantity equals kT divided by the square root of 2π times diameter squared times pressure.

ANSWER: **mean free path**

[10] Kinetic theory predicts that the velocities of gas particles obey this distribution. It is a special case of a general distribution that gives the probability of a molecule being in a given state as a function of the energy of the state.

ANSWER: **Maxwell**-Boltzmann distribution [prompt on **Boltzmann** distribution]

<SR Chemistry>

10. Answer the following about works of microhistory that make use of church documents, for 10 points each.

[10] Transcripts of this institution's trial of a woman who had prophetic dreams critical of Philip II are the main source of *Lucrecia's Dream* by Richard Kagan. Under Ferdinand and Isabella of Spain, this institution persecuted alleged heretics.

ANSWER: the Spanish **Inquisition**

[10] In *The Cheese and the Worms*, a historian from this country wrote about the Inquisition's trial of a miller with weird cosmological views. Jacob Burkhardt's best-known book discusses a cultural movement in this country.

ANSWER: **Italy** [or **Italia**]

[10] Judith Brown's *Immodest Acts* documents a member of this profession who had sex with Bartolomea Crivelli while pretending to be an angel named Splenditello. Martin Luther rescued several people of this occupation by smuggling them inside of herring barrels.

ANSWER: **nuns** [or **abbesses**; or **prioress**; do not accept or prompt on "monks," "priests," etc.]

<JB European History>

11. In opposition to "authentic," this term describes the even-numbered, "hypo-" prefixed church modes, whose final lies in the middle of the range. For 10 points each:

[10] Give this term for a cadence in which a 4 chord resolves to a 1 chord. It is often also called an "Amen cadence."

ANSWER: **plagal** [accept **plagal** cadence or **plagal** mode]

[10] A plagal cadence ends *In Ecclesiis* ("een ek-KLAY-see-ese") from this organist's 1615 *Sacrae symphoniae*. He composed in the polychoral style at St. Mark's Basilica in Venice and was one of the first composers to specify instrumentation and dynamics.

ANSWER: Giovanni **Gabrieli**

[10] This composer featured unisons, word painting, and a strong plagal cadence in a six-part motet, the first setting of *O Magnum Mysterium*. His *Pope Marcellus Mass* supposedly "saved polyphony" from condemnation at Trent.

ANSWER: Giovanni Pierluigi da **Palestrina**

<OL Music>

12. In Colson Whitehead's most recent novel, Cora performs this action with the aid of a literal railroad. For 10 points each:

[10] Identify this action which Harriet Jacobs performed after spending seven years hiding in an attic, and which Frederick Douglass performed by using a train and a steamboat to travel north to Philadelphia.

ANSWER: **escaping slavery** [or anything similar to being a **runaway slave**; prompt on partial answers]

[10] This protagonist of Toni Morrison's *Beloved* runs away from Sweet Home plantation and uses a saw to kill her infant daughter after slavers come to take them back.

ANSWER: **Sethe**

[10] The slave Moses runs away after failing to marry Caldonia, the wife of the deceased black plantation owner Henry Townsend, in this 2004 Pulitzer-winning novel by Edward P. Jones.

ANSWER: *The **Known World***

<JB American Literature>

13. In 2012, bedaquiline became the first new drug made to treat one infection caused by a bacterium in this genus for over 40 years. For 10 points each:

[10] Name this genus. Infections by one bacterium in this genus can be tested for by issuing a subcutaneous injection of PPD and seeing whether or not a bump forms.

ANSWER: Mycobacterium [or Mycobacteria]

[10] A species of *Mycobacterium* is the causative agent of this lung infection, which was historically called consumption.

ANSWER: tuberculosis [or TB]

[10] *Mycobacteria* can be detected using the Ziehl–Neelsen method for this type of histological stain, which uses carbol fuchsin (“FYOOK-sin”), followed by an acidic alcohol as a decolorizer, followed by a methylene blue counterstain.

ANSWER: acid-fast stain

<WK Biology>

14. According to the “real” theory of these entities, they are optimal responses of the economy to changes in total factor productivity, making government intervention unnecessary. For 10 points each:

[10] Name these entities, which are fluctuations in the general rate of economic activity. Phases of these entities include expansion, during which the economy grows, and contraction, during which the economy shrinks.

ANSWER: business cycles [or economic cycles]

[10] These long-term business cycles have a length of roughly 50 years, and are named after the Soviet economist who first observed them. Joseph Schumpeter proposed that they are caused by technological innovation.

ANSWER: Kondratiev waves [or K-waves]

[10] Another type of business cycle with a length of about 20 years is named after this economist, whose namesake curve shows how income inequality initially increases before decreasing as per capita income increases.

ANSWER: Simon Smith Kuznets

<WC Social Science>

15. Answer the following about European samurais, for 10 points each.

[10] This Japanese shogun made English sailor William Adams the first Western samurai after Adams built the first Japanese fleet of Western-style ships. He established his shogunate at the 1600 Battle of Sekigahara.

ANSWER: Tokugawa Ieyasu [prompt on Ieyasu]

[10] French samurai Eugène Collache fought for the shogunate against Southern Daimyōs in this 1860s war. The armed portion of the Meiji Restoration ended along with this war.

ANSWER: Boshin War [or Boshin Sensō]

[10] Some Western samurai in the 1600s were given command of this type of Japanese armed trade ship. They were named for the stamp on the shogun’s official royal permit that marked them as licensed traders rather than pirates.

ANSWER: red seal ships [or shuinsen]

<AP World History>

16. Answer the following about materials used in Hindu religious ceremonies, for 10 points each.

[10] This type of butter is often poured into a sacred fire, representing the satisfaction of the fire god Agni's appetite for this substance. It is also often used to light small lamps called *diyās*.

ANSWER: ghee [or ghrutam; accept tuppa, nevyi, or nei]

[10] Ghee is mixed with honey, sugar, milk, and curd to make *panchāmrita* (“punch-AHM-rit-uh”), a mixture used during this ritual bathing of idols. While this ceremony takes place, segments of the Taittirīya (“tye-tee-REE-yuh”) Upanishad (“oo-pun-ee-SHUT”) are often recited.

ANSWER: abhisheka

[10] During the *Gruha Pravasha* ceremony performed to inaugurate a new house, the owner of the house walks one of these sacred animals around the premises and allows it to be the first to step foot in the house.

ANSWER: cows [or bulls]

<AP Religion>

17. One of these animals kept at the London Zoo named Andrew Scheuchzer learns English by reading newspapers. For 10 points each:

[10] Name these animals used to farm pearls by Gussie H. Bondy after Captain Van Toch discovers them on an island in the Pacific in a novel titled for the “War with” these creatures.

ANSWER: newts [or salamanders; or mloky]

[10] *War With the Newts* is a novel by this Czech author who introduced the word “robot” in his play *R.U.R.*

ANSWER: Karel Čapek (“CHAH-peck”)

[10] While watching a performance of *R.U.R.*, Čapek asked this author whether he had the patience to make it through his “stupid, boring” play. This pioneer of the “people’s theatre” wrote a 10-volume novel sequence about the German composer *Jean-Christophe*.

ANSWER: Romain Rolland (“roll-AWN”)

<AP European Literature>

18. Answer the following about Canadian politics in 2015 and 2016, for 10 points each.

[10] This Liberal politician was elected as Prime Minister in October 2015. He is the eldest son of a former Québécois PM who opposed the FLQ.

ANSWER: Justin Trudeau [prompt on Trudeau]

[10] In September 2015, an image of this three-year-old boy’s lifeless body generated discussion about Canada’s immigration policy, since this child drowned during his family’s attempt to escape Turkey to take refuge in Canada.

ANSWER: Alan Kurdî [or Aylan Kurdi]

[10] In April 2016, delegates of this socialist Canadian political party, the third-largest in the House of Commons, elected to have a new leadership vote to select Tom Mulcair’s replacement.

ANSWER: New Democratic Party [or Nouveau Parti Démocratique; accept NDP or NPD]

<AP Other (Current Events)>

19. This thinker became known as the “First Teacher,” while his interpreter al-Farabi was called the “Second Teacher.” For 10 points each:

[10] Name this Greek philosopher, a student of Plato whose work became influential in the Islamic world after the Translation Movement brought his writings, such as *Metaphysics*, to Baghdad.

ANSWER: Aristotle [or Aristutalis]

[10] This philosopher claimed to have read Aristotle’s *Metaphysics* forty times without understanding it until he read al-Farabi’s commentary. This man’s thought was attacked in al-Ghazali’s *The Incoherence of the Philosophers*.

ANSWER: Avicenna [or Ibn Sina; or Abu ‘Ali al-Husayn ibn Sina]

[10] Avicenna was influenced by an Arabic treatise called *The Theology of Aristotle*, which was really a partial summary of this book. This collection compiled by Porphyry details his teacher’s principles of the One, the Intellect, and the Soul.

ANSWER: *The Enneads* [or *The Six Enneads*] (by Plotinus)

<JB Philosophy>

20. A distribution named for this mathematician describes the angle that a line, with a fixed point of rotation, makes with a vertical axis, and has no defined mean or variance. For 10 points each:

[10] Name this mathematician who names a theorem with Goursat that says that a closed integral around an analytic region in the complex plane is equal to zero.

ANSWER: Augustin-Louis Cauchy (“koh-SHEE”)

[10] The Cauchy distribution does not satisfy the central limit theorem, which states that the sample mean of a well-defined population will follow this distribution. This distribution is sometimes called the “bell curve.”

ANSWER: normal distribution [accept Gaussian distribution]

[10] This function for the Cauchy distribution equals one-half minus the arctangent of x over π . This monotonically decreasing function maps a set of events to time, and equals the complement of the cumulative distribution function.

ANSWER: survival function [accept survivor function or reliability function]

<SY Other Science (Math)>