

2022-2023 IQBT Regular Season Set #1
Round 3 – Tossups

1. **This man removed Peter Strzok (struck) from an investigation after text messages between Strzok and Lisa Page were leaked. Don McGahn threatened to resign rather than follow an alleged order to (*) fire this man. This man became the director of the FBI one week before the September 11 attacks. William Barr was accused of issuing a misleading summary weeks before a document helmed by this man was released in 2019. For 10 points, name this former director of the FBI who investigated Russian election interference in a namesake 2019 report.**

ANSWER: Robert Mueller (MULL-er) [Robert Swan Mueller III]

2. **When variables have this property, the formulas for Boolean decomposition and orthogonal linear interpolation are the same. Two events with a covariance of zero have this property, as do the outcomes of Bernoulli trials. A collection of variables with the mutual form of this property also has its pairwise form. If the probability of A times (*) the probability of B equals the probability of A and B, then events A and B have this property. Dice rolls are events with, for 10 points, what property in which one outcome does not affect subsequent outcomes?**

ANSWER: independence [or independent events; or mutual independence; or pairwise independence]

3. **A secessionist movement named for this mountain range uses the “Doug flag” and grew out of the 1940s “State of Jefferson” movement. Mount Adams is the highest point of this mountain range's Gifford Pinchot (pin-CHOH) National Forest. The only mountain in the continental U.S. on the Decade Volcanoes list is in this range that is home to (*) Crater Lake. The Columbia River Gorge cuts into this range, which contains climbing sites such as Mount Hood. For 10 points, name this range of the Pacific Northwest that includes Mount Rainier and Mount Saint Helens.**

ANSWER: Cascade Range [or Cascades]

4. **This was the primary instrument played by the lead artist on the album *Moanin'* who co-founded the Jazz Messengers. Art Blakey and Gene Krupa played this instrument, the latter collaborating with clarinetist Benny Goodman on “Sing, Sing, Sing.” Krupa also appeared on “Bernie's Tune,” which has a six-minute solo by another player of this instrument, (*) Buddy Rich. Performers of this instrument often choose between a traditional or a matched grip. For 10 points, name this jazz instrument which has bass and snare varieties.**

ANSWER: drums [or drum kit; prompt on percussion]

5. **The smallest scales of this phenomenon are the Kolmogorov (kul-MAH-GOR-off) microscales, which facilitate energy cascades. Time-averaged equations such as the Reynolds-averaged Navier–Stokes (NAV-yay-stoaks) equations are used to model this phenomenon in computational fluid dynamics. This form of (*) fluid flow occurs at very high Reynolds numbers. Eddies and vortices are produced in this form of fluid flow, which is contrasted with laminar flow. For 10 points, name this chaotic form of fluid flow that can cause bumpy airplane rides.**

ANSWER: turbulence [or turbulent flow]

6. A collection by an author of this ethnicity features a character who is repeatedly told about his father seeing Jimi Hendrix at Woodstock. That man of this ethnicity wrote a novel in which a blues trio meets Robert Johnson, and adapted for film his collection titled for the Lone Ranger. An author of this ethnicity wrote of the death of his (*) sister in a novel in which youth basketball star Junior is born with hydrocephalus. For 10 points, name the ethnicity of Sherman Alexie, who wrote about this group in an *Absolutely True Diary*.

ANSWER: American Indian [or Native American; or Spokane; or Coeur d'Alene; prompt on Indian]

7. The Lambing Flat riots targeted people originally from this present-day country at Stoney Creek and other gold fields. Ned Kelly's first run-in with the law was being accused of robbery by a pig farmer originally from this country. Many people fled to Australia from this country during the (*) Panti-Hakka clan wars. A city in this country is the namesake of a practice of forcibly retaining sailors on ships. An 1882 "exclusion act" curtailed immigration to the U.S. from, for 10 points, what country that provided many workers on the Transcontinental Railroad?

ANSWER: China [People's Republic of China; or Zhongguo; or PRC; or Zhonghua Renmin Gongheguo]

8. One of these two men claimed to have seen six extra birds in an augury contest, after which the other member of this pair humiliatingly jumped over a low wall constructed by the other. These two men kill King Numitor's (NOO-mit-or's) usurper, Amulius (am-YOO-lee-us), who earlier sentenced them to death. A dispute between these two men near the (*) Palatine (PAL-uh-tyne) and Aventine (AV-en-tyne) Hills leads to one of them dying. The Vestal Virgin Rhea Silvia (RAY-uh SIL-vee-uh) gave birth to these two men, who were set afloat on the Tiber (TAI-bur) River and suckled by a wolf. For 10 points, name these twin founders of Rome.

ANSWER: Romulus and Remus [answers may be given in either order, but do not accept or prompt if only one answer is given]

9. This singer starred in a music video that also featured Andrea Denver and Sean O'Pry and was filmed at Oheka Castle as part of a collaboration with American Express. In 2021, this performer announced plans to re-record earlier material to regain publishing rights, starting with *Fearless*, in a series labeled her (*) "version." This singer of "Wildest Dreams" sings about Joe Jonas in her song "Forever and Always" and Jake Gyllenhaal in "All Too Well." For 10 points, name this singer-songwriter of the songs "Willow," "Cardigan," and "Bad Blood."

ANSWER: Taylor Swift [Taylor Alison Swift; or Taytay]

10. Within two years in this city, unarmed Guinean immigrant Amadou Diallo (AH-muh-doo dee-AH-loh) was killed and Haitian-born Abner Louima (loo-EE-muh) was assaulted by police. Matias Reyes ultimately confessed to a crime in this city for which five Black boys were originally accused in the assault of a (*) jogger, prompting a full-page ad advocating the death penalty placed by Donald Trump. The practice of stop-and-frisk increased in this city under a police commissioner appointed by mayor Rudy Giuliani. For 10 points, name this city that was the site of the Central Park Five case.

ANSWER: New York City [or NYC]

11. These entities socially construct the meaning of anarchy according to Alexander Wendt's foundational article of constructivist theory. The modern concept of these entities is often dubbed the "Westphalian" (west-FAIL-yun) definition. A capability trap in the power of these entities can result in an erosion of these things' monopoly on the (*) legitimate use of force, leading to these things becoming "failed." For 10 points, name these things whose power politics towards each other are the subject of international relations theory.

ANSWER: states [or countries; prompt on nations; prompt on governments]

12. A ballet based on writings by this author debuted in 1940, with Galina Ulanova (GAH-lee-nah oo-LAH-noh-vah) and Konstantin Sergeyev (kahn-stan-TEEN sair-GAYV) playing lead roles at the Kirov and a score incorporating a gavotte (gaa-VAWT) from the *Classical* symphony. For a 1962 ballet inspired by this author, George Balanchine (BAAL-an-sheen) adapted incidental music by Felix Mendelssohn, including the (*) “Wedding Dance.” The “Dance of the Knights” appears in a Sergei Prokofiev (SUR-gay pro-KAH-fee-ev) ballet named for a play by this author. For 10 points, name this author who inspired the piece “Montagues (MAHN-tug-yooz) and Capulets” (KAP-yoo-lets) in Prokofiev's *Romeo and Juliet*.

ANSWER: William Shakespeare

13. The *Ludus Magnus* was a large facility for training people of this profession. Female members of this profession were included in a *munus* (MOO-nus) held by Domitian (doh-MISH-un) that described them as Amazons. Emperor (*) Commodus (KAH-mud-us) frequently participated in this profession, whose members often ate barley for strength. The “turned thumb” gesture was used by the public to judge the fate of people in this profession. For 10 points, name this profession of people trained to fight in the Colosseum for entertainment.

ANSWER: gladiators [prompt on slaves]

14. A short story by this author features the question, “In a riddle whose answer is chess, what is the only prohibited word?” A character in a story by this author describes knowing “the Secret,” which is a “British artillery park on the Ancre” (AHN-kur). A story by this author features a hunt by the “Purifiers” through (*) infinite hexagonal rooms. Richard Madden kills sinologist Stephen Albert to signal the Germans in a story by this author. For 10 points, name this author whose *Ficciones* (FEEK-see-OH-nays) includes “The Library of Babel” and “The Garden of Forking Paths.”

ANSWER: Jorge Luis Borges (BOR-hays)

15. This artist painted six identically-dressed men in black and white in a painting that became an iconic symbol of a cigar brand. This artist's only seascape was stolen from the Isabella Stewart Gardner Museum. This artist of *Syndics of the Drapers Guild* and *Storm on the Sea of Galilee*, who used his wife (*) Saskia as a model, painted a gun blending into feathers on a hat and a girl in a white dress wearing a dead chicken on her waist. The militia of Frans Banning Cocq (“coke”) was painted by, for 10 points, what Dutch artist of *The Night Watch*?

ANSWER: Rembrandt [Rembrandt Harmenszoon van Rijn]

16. The rate of increase in this quantity is equal to genetic variance according to Fisher's fundamental theorem. The frequency of a particular genotype in a population will decrease if it has a low value for this quantity. The “inclusive” form of this quantity is increased in (*) kin selection, and parental investment is a strategy to increase this quantity. Inbreeding decreases this quantity, which in sterile animals is zero. For 10 points, name this measure of an organism's ability to pass its genes on to the next generation.

ANSWER: fitness [or W]

17. This company's New Global Architecture initiative designed its Dynamic Force product line. This company's origin in making looms influenced ideas such as “continuous improvement” or *kanban* that form its much-emulated “Production System.” The last phase of the (*) Chadian-Libyan conflict in the 1980s is named for the use of this company's Hilux product. In the 21st century, this company surpassed four banks and Tokyo Electric to become the largest firm in Japan. For 10 points, name this auto manufacturer that produces the Corolla, Prius, and Camry.

ANSWER: Toyota [Toyota Motor Corporation]

18. This author appended an essay explaining “What Happened Afterward” to one of his plays after he was annoyed by edits by Herbert Tree to make the ending happier. In another play by this author, John Tanner is the author of *The Revolutionist's Handbook*, and the main character converses with Don Juan in (*) Hell. Another play by this author of *Man and Superman* revolves around a bet made by Henry Higgins with Colonel Pickering about passing off Eliza Doolittle as a duchess. For 10 points, name this author of *Pygmalion*.

ANSWER: George Bernard Shaw

19. This man suggested lighting all synagogues on fire in his treatise *On the Jews and Their Lies*. Frederick III sent men dressed as highway robbers to safely escort this man to Wartburg (VART-boorg) Castle for hiding. Charles V (the fifth) issued the Edict of (*) Worms (vurmz) after this man refused to renounce his criticisms of practices such as indulgences. Pope Leo X (the tenth) demanded that this man renounce his writings, which he may have nailed to the door of the Castle Church in Wittenberg (VIT-en-BAIRG). For 10 points, name this German theologian who started the Protestant Reformation.

ANSWER: Martin Luther

20. These events were defined using a compendium of marine animals written by Jack Sepkoski. A “gun” hypothesis describes how the breakup of methane clathrates may have contributed to one of these events. One of these events described by the Alvarez hypothesis made way for a large amount of (*) adaptive radiation in mammal species. The sixth one of these events, dubbed the Holocene, is currently ongoing, and the last one happened 65 million years ago. For 10 points, name these events, such as the K-T and the “Great Dying” in which many species end.

ANSWER: mass extinction events

21. This city's Kimmel Center is home to a non-opera orchestra conducted by Montreal-born Yannick Nezet-Seguin (yah-NEEK NEZ-eh-say-gah). The Curtis Institute of Music is in this city. Eugene Ormandy (OR-man-dee) was the longtime conductor of a “Big Five” orchestra in this city that uses a “sound” pioneered by (*) Leopold Stokowski (staw-KAWV-skee) and plays the score in most of *Fantasia*. The theme to *Monty Python's Flying Circus* was a Sousa march named for an object in this city that legendarily rang on July 8, 1776. For 10 points, name this city whose Independence Hall is adjacent to the Liberty Bell.

ANSWER: Philadelphia, Pennsylvania [or Philly]

2022-2023 IQBT Regular Season Set #1
Round 3 – Bonuses

1. For 10 points each, answer the following about contemporary American painter Amy Sherald.

[10] Sherald painted the official portrait of this woman. In 2018, the official portrait of this woman's husband was painted by Kehinde **(keh-HIN-day)** Wiley.

ANSWER: Michelle Obama [Michelle LaVaughn Robinson Obama; or Michelle LaVaughn Robinson; prompt on Obama]

[10] Sherald used gray-scale skin coloring and an aqua background for a portrait of this woman, who was fatally shot in 2020 in her Louisville apartment, sparking nationwide protests.

ANSWER: Breonna Taylor

[10] To portray skin tones, Sherald often uses this technique of painting entirely in shades of gray to imitate sculpture, which was often utilized in the Renaissance.

ANSWER: grisaille (**GRIZ-ai**)

2. This politician called the *laissez-faire* policies of John Major “Anglo-Saxon ultraliberalism.” For 10 points each:

[10] Name this two-time prime minister who became president of France from 1995 to 2007. For his second term, he founded the new UMP party.

ANSWER: Jacques Chirac (**shee-RAHK**) [Jacques René Chirac]

[10] Chirac survived an assassination attempt in 2002 during this holiday, which commemorates the storming of a Parisian prison that began the French Revolution on July 14, 1789.

ANSWER: Bastille Day

[10] Chirac commissioned a Bible scholar to write a briefing on Gog and Magog after being puzzled by a metaphor in a 2003 phone call from the U.S. President arguing for this goal.

ANSWER: getting France to join in the U.S.-led coalition for the Iraq War [or answers referring to the 2003 Iraq War; or invasion of Iraq; or overthrow of Saddam Hussein]

3. The Hòa Hảo (**hwah HOW**) movement's founder, Huỳnh Phú Sổ (**hun FOO soh**), is considered a reincarnation of one of these beings. For 10 points each:

[10] Hòa Hảo is often considered a branch of a major world religion named after what enlightened beings, such as one born as Siddhartha Gautama (**sid-ART-uh GOH-tuh-muh**)?

ANSWER: Buddhas [or Buddhism]

[10] In Vietnam, Hòa Hảo is symbolized by a white one of these plants that name the Buddhist society behind China's Red Turban Rebellion. A sutra (**SOO-truh**) named for this plant teaches that everyone can become a Buddha.

ANSWER: lotus [or white lotus; or White Lotus Society; or Lotus Sutra; prompt on flowers]

[10] Hòa Hảo initiates inform their family of taking refuge in the Buddha, Dharma (**DAR-mah**), and Sangha (**SAHN-guh-HAH**), which are referred to as three of these objects.

ANSWER: Three Jewels [or Triple Gems; or Triratna; prompt on Three Refuges]

4. In 1907, this region's parliament, the Løgting (**LEK-ting**), instituted a ban on alcohol that remained in effect until 1992. For 10 points each:

[10] Name this archipelago, which was occupied by the British in Operation Valentine starting with its capital Tórshavn (**TEH-oosh-AO-win**).

ANSWER: **Faroe** Islands [or the **Faroes**; or **Føroyar**; or **Færøerne**]

[10] After the Napoleonic Wars, the Faroe Islands became part of this mainland country, whose World War II-era king Christian X (**the tenth**) was also the only King of Iceland.

ANSWER: **Denmark** [Kingdom of **Denmark**; or Kongeriget **Danmark**]

[10] Danish control of the Faroe Islands began after the Kingdom of Norway entered the Kalmar Union, which opposed this medieval coalition of merchant guilds around the North and Baltic seas.

ANSWER: **Hanseatic** League [or **Hansa**]

5. This director's last two films, *El Dorado* and *Rio Lobo*, are both partial remakes of his *Rio Bravo*. For 10 points each:

[10] Name this director of *Bringing Up Baby* and *His Girl Friday*, who directed Lauren Bacall in “tough-talking” roles in *To Have and Have Not* and *The Big Sleep*.

ANSWER: Howard **Hawks** [Howard Winchester **Hawks**]

[10] This 1932 Hawks gangster movie was remade into a 1983 film starring Al Pacino as Cuban drug lord Tony Montana.

ANSWER: **Scarface**: *The Shame of a Nation* [or *The Shame of a Nation*]

[10] The novella “Who Goes There” inspired a 1951 Hawks-produced film as well as this director's *The Thing*. This man also directed the original entry in the slasher *Halloween* series.

ANSWER: John **Carpenter**

6. The capillary loops in this organ can be thickened during lupus, causing a “wire-loop” appearance. For 10 points each:

[10] Name this bean-shaped organ that is responsible for the filtration of blood to produce urine.

ANSWER: **kidney**

[10] This structure formed by the renal corpuscle and renal tubule is the functional subunit of the kidney.

ANSWER: **nephron**

[10] Kidneys can reabsorb water due to insertion of this channel protein that selectively allows water to pass through. Vasopressin promotes expression of this protein.

ANSWER: **aquaporin**

7. A novel by this author begins with eight people being led to an island in Devon (**DEV-un**) for a meeting. For 10 points:

[10] Name this author who wrote about the suspected murderer “U. N. Owen” in *And Then There Were None*.

ANSWER: Agatha **Christie**

[10] Christie's *Murder on the Orient Express* is set in this kind of location. The detective Poirot systematically investigates the compartments of one of these locations as it's stopped during a blizzard.

ANSWER: **train**

[10] *And Then There Were None* ends with the police receiving a message delivered in this manner. Edgar Allan Poe's first popular story involved a message delivered in this manner.

ANSWER: in a **bottle** [prompt on from the ocean; prompt on from the sea; prompt on **watertight** container]

8. Some elements are named after famous scientists. For 10 points each::

[10] Element number 96 is named after this woman whose studies of radioactive pitchblende with her husband Pierre led the duo to discover polonium and radium.

ANSWER: Marie **Curie** [or Madame **Curie**; or Marie **Skłodowska**]

[10] What chemical element is named after the physicist whose 1905 paper gave the first explanation linking Brownian motion to the existence of definable atoms using statistical molecular theory?

ANSWER: **einsteinium** [or **Es**]

[10] Yuri Oganessian, the only living namesake of an element, discovered six superheavy elements by targeting radioactive elements with this alkaline earth metal.

ANSWER: **calcium** [or **Ca**]

9. Jim loses a forty dollar bet when lead shot is placed in one of these animals' mouths. For 10 points each:

[10] Name this type of animal. One of these animals named “Dan'l Webster” is central to a story told by Simon Wheeler in a California mining camp.

ANSWER: **frog**

[10] Dan'l Webster is the title frog in this author's “The Celebrated Jumping Frog of Calaveras County.” This author also wrote *The Adventures of Huckleberry Finn*.

ANSWER: Mark **Twain** [or Samuel Langhorne **Clemens**]

[10] Another story set in a California mining camp features the orphan Thomas who is killed in a flood. That story, “The Luck of Roaring Camp,” is by this author.

ANSWER: Bret **Harte**

10. For 10 points each, answer the following about developmental psychology.

[10] This psychologist, with his wife Joan, proposed an eight-stage system of psychosocial development that contrasts pairs such as trust and mistrust and initiative and guilt.

ANSWER: Erik **Erikson** [Erik Homburger **Erikson**; or Erik **Salomonsen**]

[10] This Swiss psychologist put forth a theory of cognitive development, which theorized that the first two years of life are the “sensorimotor stage.”

ANSWER: Jean **Piaget** [Jean William Fritz **Piaget**]

[10] The Arsenal center for child psychology in Pittsburgh was founded by Erikson, Margaret McFarland, and this pediatrician, whose 1946 book *Baby and Child Care* was hugely influential on the raising of Baby Boomers.

ANSWER: Benjamin **Spock** [Benjamin McLane **Spock**; or Dr. **Spock**]

11. Victor Hugo's novels frequently advocated for social change in France. For 10 points each:

[10] Hugo raised public support for preserving this landmark by writing about a “hunchback” who resided here named Quasimodo.

ANSWER: **Notre Dame** [or **Notre-Dame de Paris**; or *Hunchback of **Notre Dame***]

[10] Hugo's witnessing of an arrest inspired the portrayal of this police inspector who tries to capture Jean Valjean (**zhahn val-zhahn**) in *Les Miserables* (**lay miz-uh-ROB**).

ANSWER: Inspector **Javert**

[10] Watching one of these objects being greased inspired an 1829 novel by Hugo about a man known only as The Condemned. Hugo's last novel, *Ninety-Three*, describes a period in which these objects were frequently used.

ANSWER: **guillotines**

12. Trevor Rainbolt helped popularize this game, whose notable YouTube streamers include Tom Davies. For 10 points each:

[10] Name this game in which players guess locations from street view imagery. This game's official coverage does not include China or most of Africa.

ANSWER: **GeoGuessr** (**jee-oh-GUESS-err**)

[10] GeoGuessr's HUD uses the standard overlay of this web platform with interactive panoramic street views. It is operated by a company whose parent is Alphabet.

ANSWER: **Google Maps**

[10] Part of GeoGuessr's spark in popularity was due to this YouTuber and streamer, who won "Streamer of the Year" for 2022 and hosted a 30-day subathon on Twitch in 2021.

ANSWER: **Ludwig** [or Ludwig Anders **Ahgren**]

13. This city's Et'hem Bey Mosque is named for the *Bejte* poet who oversaw its completion. For 10 points each:

[10] Name this city, built around Skanderbeg Square, which houses an art museum in a former Cold War bunker called Bunk'Art.

ANSWER: **Tirana**

[10] A valley northwest of Tirana provides views of this body of water, which is connected to the Ionian Sea by the Strait of Otranto. The cities of Split and Dubrovnik lie on this body of water.

ANSWER: **Adriatic** Sea [prompt on **Mediterranean** Sea]

[10] Tirana is the capital of this Balkan country to the north of Greece. Like the ethnically similar Kosovo, this majority-Muslim country is one of the world's most pro-American populations.

ANSWER: **Albania** [or **Shqiperia**]

14. A riot occurred at this city's Compton's Cafeteria after police harassment of trans people. For 10 points each:

[10] Name this northern California city whose first gay bar opened two years after a devastating 1906 earthquake.

ANSWER: **San Francisco**

[10] This first openly gay elected official in the U.S. was assassinated in San Francisco by Dan White in 1978.

ANSWER: Harvey **Milk** [Harvey Bernard **Milk**]

[10] Harvey Milk was known as the "mayor of" this street in San Francisco, whose namesake neighborhood surrounding its length from Market Street to 19th Street is the city's traditional gay district.

ANSWER: **Castro** Street

15. Goldbach's conjecture states that these numbers, when greater than two, are the sum of two prime numbers. For 10 points each:

[10] Name this type of integer whose parity is 0.

ANSWER: **even** number

[10] Functions can be considered even if they have this property with respect to the y-axis.

ANSWER: **symmetry** [or **symmetric**]

[10] A maximum for the number of possible values that violate Goldbach's conjecture can be calculated so long as this other assertion's generalized form is true. This assertion states that the complex zeroes of a certain zeta function can only have real part one-half.

ANSWER: generalized **Riemann** hypothesis

16. The protagonist of a 14th-century epic is led through this place by Virgil. For 10 points each:
[10] Name this place toured by Dante in the *Inferno*, where Dante witnesses sinners being punished.

ANSWER: **Hell** [or Christian **hell**; prompt on the **underworld**]

[10] In the second circle, Dante encounters those who committed this sin, such as Paolo and Francesca.

ANSWER: **lust** [or **carnal** knowledge; or **adultery**]

[10] Along with Trajan, a participant in this war is the only pagan to reach heaven in *Divine Comedy*. Other participants in this war suffer a double flame in the eighth circle, including one who gives a speech about passing through the Pillars of Hercules.

ANSWER: **Trojan War**

17. During this conflict, a group fought to establish an ethnic homeland, in a territory the organization called “Eelam” (**EE-lahm**). For 10 points each:

[10] Name this conflict that began in 1983 and was fought between a group led by Velupillai Prabhakaran (**VEL-oo-pil-ai preb-AH-kuh-run**) and a government dominated by the Sinhalese (**SIN-uh-leez**) ethnicity.

ANSWER: **Sri Lankan Civil War**

[10] This ethnic group's “Liberation Tigers” fought against the Sinhalese government in Sri Lanka until its surrender in 2009.

ANSWER: **Tamils** (**TAH-milz**) [or **Tamilar**; or **Tamilians**; or **Tamil** Tigers]

[10] The Tamil Tigers assassinated Rajiv, an Indian prime minister with this surname. Rajiv was the son of Indira, another assassinated Indian prime minister with this surname.

ANSWER: **Gandhi**

18. This politician ordered the disassembly of several mail-sorting machines across the country prior to the 2020 return of mail ballots. For 10 points each:

[10] Name this current Postmaster General of the United States.

ANSWER: Louis **DeJoy**

[10] DeJoy was named a deputy finance chairman to the Republican National Committee in 2017, as was this now-disbarred lawyer who previously served as Donald Trump's personal attorney.

ANSWER: Michael **Cohen** [Michael Dean **Cohen**]

[10] Cohen pleaded guilty to perjury after lying to Congress regarding his knowledge of a proposal to build a Trump Tower in this European city. The tower here was to include a penthouse for Vladimir Putin.

ANSWER: **Moscow** [or **Moskva**]

19. The 2017 Nobel Prize in Physics was awarded for contributions to this experiment. For 10 points each:

[10] Name this experiment and group of observatories, which use mirrors four kilometers apart and laser interferometry to detect changes that are one ten-thousandth the diameter of a proton.

ANSWER: **LIGO** [or **Laser Interferometer Gravitational-Wave Observatory**]

[10] LIGO was designed to detect these disturbances in spacetime that are predicted by general relativity. The setup first detected these ripples in 2016.

ANSWER: **gravitational waves** [or **gravitational radiation**]

[10] The first gravitational waves detected by LIGO were from a merger of two of these massive objects that light cannot escape from.

ANSWER: **black holes**

20. For 10 points each, answer the following about conductor Marin Alsop.

[10] Alsop is currently the music director laureate of this city's symphony orchestra, whose community partners include the nearby conservatory The Peabody Institute, a part of Johns Hopkins University.

ANSWER: **Baltimore**

[10] Alsop became the first female principal conductor of OSESP in this large South American country, the home of Heitor Villa-Lobos (**ay-TOR VEE-lah-LOH-bohs**) and bossa nova.

ANSWER: **Brazil** [Federative Republic of **Brazil**; or República Federativa do **Brasil**]

[10] Alsop's first recording was a selection of pieces by this composer of *Knoxville: Summer of 1915* and *Vanessa*.

ANSWER: Samuel **Barber** [Samuel Osborne **Barber II**]

21. Loschmidt's paradox describes the difficulty of deriving this statement from low-level irreversible processes. For 10 points each:

[10] Name this principle which states that the entropy of a closed system always increases.

ANSWER: **second law** of **thermodynamics** [prompt on laws of thermodynamics]

[10] This thought experiment was proposed as a potential violation of the second law of thermodynamics. It involves an intelligent being who sorts particles of different speeds without expending energy.

ANSWER: **Maxwell's demon**

[10] Maxwell's equations can be made completely symmetric by incorporating these theoretical particles, defined by an unusual property of force distribution, which have never been observed.

ANSWER: magnetic **monopoles**